

# Corporate Energy Management Plan





# Corporate Energy Management Plan

*Town of Aurora*



This document was prepared for the Town of Aurora by IndEco Strategic Consulting Inc.

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## Executive summary

The Town of Aurora *Corporate Energy Management Plan* describes the energy management activities that the Town as a corporation will take over the next 5 years to increase its energy efficiency, reduce its energy consumption, and minimize its environmental footprint. The Town's vision for energy management is *to establish a culture of energy conservation, while contributing to a global reduction of greenhouse gas emissions*. This vision is supported by three goals and seven objectives as described below. These goals and objectives are supported by 17 action items that are described on pages 14-15 of this Plan.

*Goal 1: Energy efficient assets - Town assets use energy efficiently and effectively within the Town.*

### **Goal 1 Objectives**

1. Review and enhance energy efficiency measures for existing buildings and equipment.
2. Review and enhance energy efficiency measures for new buildings and equipment.
3. Reduce energy consumption in Town fleet vehicles.

*Goal 2: Staff commitment to energy efficiency – Energy efficiency is integrated as part of the day-to-day activities of staff.*

### **Goal 2 Objectives**

4. Enhance communication, increase engagement and encourage behavioural modifications to improve energy efficiency.
5. Review and enhance measures related to the procurement of energy and renewable technologies.
6. Support monitoring and tracking measures to evaluate energy efficiency programs and initiatives.

*Goal 3: Systems approach to energy efficiency – An integrated/systems approach is taken when managing energy.*

### **Goal 3 Objective**

7. Ensure that energy efficiency policies, targets, and programs are integrated into the day-to-day function of the Town of Aurora.

The Town's investments in energy efficiency will yield significant returns, in the traditional economic sense, and will allow the Town to reduce its greenhouse gas emissions. This commitment will help the Town of Aurora to manage energy efficiently and ensure it is part of the day-to-day activities of Town staff.

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## Introduction

The Town of Aurora *Corporate Energy Management Plan* (the CEMP) provides a roadmap for energy management at the Town of Aurora. The CEMP describes the energy management activities that the Town as a corporation will take over the next 5 years to increase its energy efficiency, reduce its energy consumption, and minimize its environmental footprint.

North American municipalities are increasingly focusing on energy as a strategic priority to reduce operating costs, prepare for rising utility costs, and demonstrate their commitment to long-term sustainability. In Ontario, the provincial government is allocating millions of dollars to energy conservation and demand management (CDM) programs, providing energy consumers with significant incentives to upgrade their facilities and equipment.

The Government of Ontario has also expressed a commitment to greening public sector buildings, and developed *Regulation 397/11* under the *Green Energy Act (2009)* to advance this goal. Under the regulation, all public agencies including the Town of Aurora are required to report their energy consumption and greenhouse gas (GHG) emissions on an annual basis starting in 2013, and are required to submit 5-year energy conservation and demand management plans in 2014.

This Plan is intended to assist the Town in complying with the corporate energy management planning requirements of Ontario *Regulation 397/11* under the *Green Energy Act (2009)*.

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## Energy management in Aurora

Prior to the development of the *Corporate Energy Management Plan*, the Town has been actively implementing and exploring energy conservation, as well as environmental and sustainability opportunities. Several Town plans and strategies support energy conservation and GHG emission reductions, including the Town of Aurora Strategic Plan and Corporate Environmental Action Plan (CEAP). For example, under the CEAP, energy is included as one of the four key theme areas. These plans and strategies demonstrate the Town's commitment to the environment, energy, and sustainability. They establish relevant goals for the Town, as a community and as a corporation.

In addition to plans and strategies, the Town has implemented several retrofits and initiatives related to energy conservation. For instance, the Town purchased Bullfrog Eco-Certified Green Power to offset power usage at Town Hall. Technology upgrades and energy management retrofits have been completed at the Aurora Family Leisure Complex (AFLC) and Town Hall, including an update of the HVAC unit at Town Hall to an energy efficient, fully-automated system, and an upgrade of the compressor at the AFCL to an Ecohill system, which uses less energy and water to make and maintain ice for the ice rink. The Town also has been participating in the Demand Response Program since 2006 in order to conserve energy during summer months when electricity demand is at its peak.

Other noteworthy initiatives the Town has completed related to energy and the environment include:

- Installation of 17 Idle Free Zone signs at 6 Town-owned facilities;
- Installation of two electric vehicle charging stations at Town Hall and the Community Centre;

- Encouraging employees to actively commute to work by raising awareness of alternative modes of transportation and providing supporting information (in collaboration with Smart Commute Central York);
- LED lights installed in the dressing rooms of the Stronach Aurora Recreation Complex (SARC) and AFLC;
- Installation of LED parking lot lights at the library;
- Budget approved to retrofit parking lot lights at AFLC, Town Hall, and SARC with LED lighting;
- Promotion and participation in Earth Hour since 2008, achieving a Town-wide reduction in electricity consumption of 14.3% in 2011;
- Profile of Town Hall's environmental performance by producing an energy certificate;
- Creation of plaques in facilities to highlight energy management retrofits;
- Installation of a Building Automation System Network to decrease energy usage at Town facilities; and
- Approval from Council to build the new Joint Operations Centre to a LEED® Gold standard.

Some of the initiatives described above were identified through participation in PowerStream's Roving Energy Manager program, which is a program that identifies additional ways to reduce corporate electricity demand and reduce the Town's electricity bills.

The Town has also met the first and second year energy reporting requirements of *Regulation 397/11* by submitting its 2011 and 2012 energy consumption data for all Town facilities.

### *Renewables and Alternative Energy*

The Town of Aurora has also installed 10 kW rooftop photovoltaic (PV) systems at Town Hall and at the library in June 2013. Both

projects received approval from the Ontario Power Authority (OPA) as microFIT rooftop solar PV projects within the Feed-In Tariff Program. The two PV systems are estimated to generate a total of 20,368 kWh annually combined.

In addition, the Town has received approval from the OPA for a 600kW rooftop PV project at the Stronach Aurora Recreation Complex.

### *Building Portfolio Analysis*

The Town has recently completed building energy assessments for several town-owned facilities. The results of the Level I (ASHRAE) audit of the Cultural Centre and the Building Portfolio Energy Analysis and benchmarking of five additional Town buildings (as outlined in Table 1) suggest that a 10-15% improvement in energy intensity and a 10-15% reduction in greenhouse gas (GHG) emissions in the existing building stock are achievable.

**Table 1 Estimated energy intensity reductions and GHG emissions savings from measures identified in energy analysis**

<b>Facility</b>	<b>Energy intensity reductions</b>	<b>GHG emissions reductions</b>
Aurora Community Centre	20%	20%
Aurora Public Library	15%	15%
Aurora Town Hall	15%	15%
Aurora Seniors' Centre	10%	10%
Cultural Centre	23%	28%
Stronach Aurora Recreation Complex	30%	30%

The percentage energy intensity and GHG emissions reductions for these five facilities was deducted from the total energy consumption and GHG emissions for all of the Town's facilities from the last reported levels (2011) to determine the overall targets. All buildings that the Town of Aurora reported under the

Ontario Green Energy Act *Regulation 397/11* reporting requirements were included in the calculations.

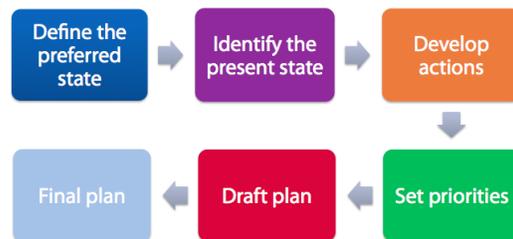
As part of the implementation of this plan, the Town will develop specific targets for energy intensity and GHG emissions consistent with the Town's Corporate Environmental Action Plan (Action # 7).

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## Development of the CEMP

The development of the CEMP was guided by a comprehensive planning process. As outlined in Figure 1, the Town followed a systematic approach in the development of this Plan that began with an analysis of the preferred state and concluded with the development of a draft Plan and Final Plan. The following provides a summary of the specific activities completed under each step:

**Figure 1 Overview of the planning process**



**Defining the preferred state** involved exploring where the Town of Aurora would like to be with respect to energy management. The elements of the preferred state were identified through interviews with staff and an online crowdsourcing activity. The preferred state helped to inform the CEMP’s visions, objectives, and actions.

**Identifying the present state** involved exploring where the Town is now with respect to energy management. Energy data analysis; interviews; walk-through audits of Town facilities; and a review of the Town’s existing policies, plans, and past energy efficiency projects were among the inputs that were used to identify the present state.

**Developing actions** involved identifying actions to help the Town move towards the preferred state. Actions were identified through walk-through audits, energy data analysis, interviews, and the online crowdsourcing activity. They were grouped under the three goals and were developed to help achieve the seven Plan objectives.

**Preparing the Draft and Final Plan** involved documenting the results of the planning process. As described in the *Administration, Updating and Reporting on the Plan* section, the CEMP will be reviewed annually and updated every five years.

Inputs to the planning process included:

- Analysis of the Town's energy use data;
- Review of the Town's existing policies, plans, and past energy efficiency projects;
- Detailed walk-through audit of one Town facility and short walk-throughs and energy data analysis of five Town facilities;
- Interviews with Town staff (including the CAO, department directors, managers, and Operations & Maintenance staff); and,
- An online crowdsourcing activity for all staff to provide input into the energy planning process.

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## Vision, Goals and Objectives

### *Vision*

The Town's vision for energy management is to establish a culture of energy conservation, while contributing to a global reduction of greenhouse gas emissions.

### *Goals and objectives*

The Town's vision for energy management is supported by three goals and seven objectives as described below:

*Goal 1: Energy efficient assets - Town assets use energy efficiently and effectively within the Town.*

#### **Objectives**

1. Review and enhance energy efficiency measures for existing buildings and equipment.
2. Review and enhance energy efficiency measures for new buildings and equipment.
3. Reduce energy consumption in Town fleet vehicles.

*Goal 2: Staff commitment to energy efficiency – Energy efficiency is integrated as part of the day-to-day activities of staff.*

#### **Objectives**

4. Enhance communication, increase engagement and encourage behavioural modifications to improve energy efficiency.
5. Review and enhance measures related to the procurement of energy and renewable technologies.
6. Support monitoring and tracking measures to evaluate energy efficiency programs and initiatives.

*Goal 3: Systems approach to energy efficiency – An integrated/systems approach is taken when managing energy.*

#### **Objectives**

7. Ensure that energy efficiency policies, targets, and programs are integrated into the day-to-day function of the Town of Aurora.

### *Actions*

The following actions will help the Town achieve its vision, goals and objectives. These actions should be completed over the 5-year timeframe of the plan.

1. Implement all feasible energy efficiency improvements for existing Town-owned facilities as outlined in Building Portfolio Energy Analyses and Assessments (Goal 1, Objective 1).
2. Conduct an audit of the five highest energy consuming Town-owned buildings (Goal 1, Objective 1).
3. Implement a minimum green building standard of LEED® Silver for all new Town facilities (Goal 1, Objective 2).
4. Continue to implement a Town-wide energy management system (EMS) (Goal 2, Objective 6).
5. Conduct an assessment of the metering needs of each Town-owned facility (Goal 2, Objective 6).
6. Explore strategic partnerships with Energy Services Company (ESCO) to identify and fund energy efficiency projects (Goal 2, Objective 5).
7. Develop corporate greenhouse gas (GHG) emission targets and corporate energy efficiency targets (Goal 3, Objective 7).
8. Regularly communicate energy initiatives as part of the Corporate Environmental Action Plan brand (Goal 2, Objective 4).
9. Document the savings achieved from energy efficiency projects and rolling out successful projects (Goal 2, Objective 6).

10. Conduct energy efficiency training for staff as required (Goal 2, Objective 4).
11. Develop consistent guidelines and policies for energy management (Goal 3, Objective 7).
12. Adopt energy efficiency standards to guide the procurement of Town-owned equipment (Goal 2, Objective 5).
13. Include general training on energy and energy efficiency as part of the Town's onboarding process (Goal 2, Objective 4).
14. Consider opportunities to upgrade Town-owned fleet vehicles to reduce costs and energy consumption (Goal 1, Objective 3).
15. Examine opportunities to expand the corporate O&M preventative maintenance program at Town facilities (Goal 1, Objective 1).
16. Conduct a life-cycle audit of Town-owned infrastructure and equipment and assess opportunities for energy efficiency upgrades (Goal 1, Objective 1).

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## Implementation

This section provides an overview of communication and programs the Town will implement to support the implementation of the CEMP. It also provides an overview of what is required to update and report on the plan, and the resources required to implement the plan.

### *Training and Communications*

General energy training should be provided to all Facilities staff to ensure that they have the knowledge and skills to contribute to efficient energy management within the Town.

Training may address:

- Energy basics (cost of energy, how and where energy is used);
- Lighting and mechanical equipment basics;
- Building automation systems and re-commissioning;
- Metering, monitoring, and the energy management system;
- How to spot energy saving opportunities;
- The Town's building policies, preventative maintenance program, and re-commissioning plan; and
- The Town's employee engagement program (including how to submit ideas and what types of ideas can be submitted).

More specific training on energy management and energy efficiency should be provided to Facilities staff responsible for operating and maintaining specific buildings. This training would be catered toward specific features of the operator's building, allowing the operator to manage energy more effectively within individual buildings.

Additionally, project specific training on energy should be provided to operators, as needed, when new equipment or a new piece of

technology is installed. This includes any updates to the building and its systems. Training for energy management should be built into the existing training and orientation process for all new hires.

Communicating about the CEMP and encouraging staff to think about energy efficiency in their day-to-day activities is one of the goals of this plan and is fundamental to improving the management of energy within the Town. This strategy should involve a combination of tools and initiatives to communicate and engage the staff.

Progress on the CEMP should also be communicated to the community so they are aware of the energy initiatives being undertaken by the corporation. The Town should create an energy page on the Town's website that include updates on the CEMP, progress on corporate energy efficiency initiatives, and information for residents on energy conservation measures.

### *Administration, Updating and Reporting on the Plan*

It is recommended that the Director of Infrastructure and Environmental Services (or delegate) be assigned responsibility for overseeing and monitoring the implementation of the CEMP. In order to support the implementation of the Plan, it is recommended that the Town establish an Energy Management Team (EMT) consisting of the Director of Infrastructure and Environmental Services, Manager of Engineering, Manager of Operations, Manager of Facilities and Fleet, Operations Supervisor, Fleet Supervisor and Program Manager of Environmental Initiatives.

The *Corporate Energy Management Plan* should be reviewed at least once a year. As part of the annual review, staff should track the activities that have been implemented within the calendar year and track quantitative progress towards identified key performance indicators (KPI's).

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## Conclusion

There are significant opportunities for the Town of Aurora to improve the energy efficiency of its buildings, to reduce utility costs, and to minimize its environmental footprint.

The Town of Aurora can take advantage of these opportunities by implementing the organizational and technological actions of the *Corporate Energy Management Plan*, including:

- Assigning appropriate staff resources to oversee and implement the actions recommended within the CEMP;
- Implementing identified technical measures and conducting energy audits on buildings with the greatest energy savings potential to discover further opportunities;
- Developing a rigorous and effective monitoring and tracking system through an EMS and supporting organizational capacity;
- Implementing education, communication, engagement and training initiatives for staff; and
- Developing organizational policies and processes for implementing the CEMP, tracking progress, and updating the CEMP.

The Town of Aurora has the motivation and expertise to implement all of the actions in the CEMP. The Town's investments in energy efficiency will yield significant returns, in the traditional economic sense, and will allow the Town to reduce its GHG emissions. This commitment will help the Town of Aurora to manage energy efficiently and ensure it is part of the day-to-day activities of Town staff.



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