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Town of Aurora

Committee of the Whole Report

No. PDS24-064

Subject: 2024 Energy Conservation and Demand Management Plan (ECDMP)

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Department: Planning and Development Services

Date: June 4, 2024

Recommendation

1. That Report No. PDS24-064 be received; and
2. That Council endorse the 2024 Energy Conservation and Demand Management Plan (ECDMP) and the recommendations contained in the 2024 ECDMP.

Executive Summary

The 2024 Energy Conservation and Demand Management Plan (ECDMP) strengthens the Town of Aurora's climate action commitment and positions the Town as a community leader in addressing climate change.

This report presents the final draft of the 2024 ECDMP which is a five-year corporate energy and greenhouse gas (GHG) emission plan for Town operations, required under Ontario Regulation 23/25: Broader Public Sector: Energy Reporting and Conservation and Demand Management Plans.

- The 2024 ECDMP sets ambitious GHG reduction targets from Town operations for the short, medium and long term; initiating a vision of net-zero by 2050
- The updated plan takes a complete approach to corporate carbon management by reporting on all major sources of GHG emissions
- Town GHG emission reductions surpassed previous ECDMP goals, through the successful implementation of measures and operational changes

- The plan takes a strategic 25-year horizon planning approach with actions designed to ensure it is implemented in a way that is impactful, cost effective, and meets the needs of the Town
- A high-level cost estimation to implement the plan was developed to help inform future capital budget planning and decision-making processes

The draft 2024 ECDMP is provided in Attachment 1.

Background

In October 2019, Town Council joined more than 500 Canadian municipalities and declared a *Climate Emergency*, solidifying commitments to addressing climate change. Most of those municipalities have since reestablished a goal of reducing GHG emissions to net-zero by 2050, aligned with the updated Paris Agreement.

The Town joined the Blue Dot movement in 2016. The Blue Dot movement is a campaign based on the idea that everyone in Canada deserves the right to a healthy environment, including clean air and water, and a voice in decisions that affect individual health.

The Town joined the Partners for Climate Protection (PCP) program in 2018. The program is a national network of over 400 municipalities with the shared goal of taking action against climate change and reducing local GHG emissions. The program supports municipalities in their climate actions by following a five-step milestone process. The PCP milestones include:

- 1) Completing a GHG emission inventory
- 2) Setting a reduction target
- 3) Developing a local action plan
- 4) Implementing the plan
- 5) Monitoring progress and reporting results

The milestone process has two streams: Corporate-level (climate action for municipal operations) and the Community-level (climate action for the community as a whole). The current PCP Milestone status for the Town is:

- Community-level: Milestone 1-3 completed, Milestone 4-5 are in-progress.
- Corporate-level: Milestone 1-3 complete through the 2024 ECDMP.

Analysis

The 2024 ECDMP sets ambitious GHG reduction targets from Town operations for the short, medium and long term; initiating a vision of net-zero by 2050

The original target outlined in the 2019 ECDMP aimed to reduce GHG emissions by 16 per cent by 2023, with no medium or long-term objectives.

The following targets are proposed compared to a 2018 baseline:

- Short term target: 20 per cent GHG emissions reduction by 2030
- Medium term target: 50 per cent GHG emissions reduction by 2035
- Long term target: net-zero GHG emissions by 2050

The 2024 ECDMP takes a complete approach to corporate carbon management by reporting on all major sources of GHG emissions

The ECDMP further advances the Town's GHG emission inventory, following carbon management best practices that follow gold standard protocols like the PCP protocol. The 2024 ECDMP includes energy use and GHG emissions from the following sources:

- Buildings (offices, recreation centres, library, etc.)
- Fleet (vehicles and equipment)
- Water and wastewater facilities (pumping stations)
- New in 2024: Solid waste (from all Town-owned waste receptacles)
- New in 2024: Public lighting (streetlight, parks, trails, Town-owned parking lots)

Town GHG emission reductions surpassed the previous ECDMP goals, through the successful implementation of measures and operational changes

The overall goal in the 2019 ECDMP was to reduce electricity consumption by 10.5 per cent, natural gas consumption by 9.7 per cent, and GHG emissions by 15.9 percent from the 2018 baseline by the end of 2023. In that timeframe, the Town decreased electricity consumption by 2 per cent and natural gas consumption by 27 per cent. This resulted in an overall reduction in GHG emissions of 20 per cent, surpassing the goal of 16 percent.

Several factors impacted energy consumption during this time: COVID-19 facility closures and re-opening, weather impacting heating and cooling demand, acquisition of new Town facilities (Yonge Street properties and Sports Dome), major construction at

Town facilities (Aurora Cultural Centre and the Library) and impacts from energy conservation measures.

A list of projects and initiatives that were completed is found in Attachment 2 - List of completed projects (2019-2023).

The plan takes a strategic 25-year horizon planning approach with actions designed to ensure it is implemented in a way that is impactful, cost effective, and meets the needs of the Town

Working towards net-zero by 2050, the plan outlines a three staged approach, reflected in the short, medium and long term planning outlook.

Short-term (2025-2030): The following list of energy conservation measures are recommended in the short term, which focus on any remaining energy efficiency projects and continuing fleet decarbonization, details found in the report:

- Retrofit any remaining lights to LED
- Retrofit any remaining water fixtures to low-flow
- Optimize building controls once Building Automation Systems (BAS) upgrades are completed (planned in 2024)
- Investigate and install pool covers at recreation facilities
- Replace boiler at the Library with a high efficiency alternative
- Implement optimum HVAC scheduling at Senior Centre
- Decarbonize light-duty By-Law vehicles
- Continue to decarbonize the ice resurface vehicles at recreational facilities
- Decarbonize Parks equipment (such as lawn mowers and tractors)
- Investigate opportunities to convert sports field lighting fixtures to LED

Also, the following strategic measures are recommended:

- Continue with the implementation of the Green Fleet Action Plan
- Support employee training
- Continue with building performance monitoring and extend to other areas
- Investigate and develop a sustainable building standard
- Investigate and develop a Carbon Offset Strategy and Policy
- Perform feasibility studies on low-carbon building systems (such as heat pumps, low-e ceilings, increasing roof insulation, etc.) and inform capital budget planning

- Perform feasibility studies on low-carbon fleet technologies and assessing infrastructure needs and upgrades
- Initiate implementation of projects identified from the feasibility studies
- Develop a waste audit and reduction plan for Town facilities and public areas
- Perform regular ASHRAE Level 3 energy audits at Town facilities

Through the short-term implementation, the following impacts are estimated by 2029:

- Electricity consumption reduced by 8 per cent
- Natural gas consumption reduced by 11 per cent
- Propane consumption reduced by 100 per cent
- Ethanol 10 consumption reduced by 10 per cent
- Biodiesel 5 consumption reduced by 8 per cent
- Annual utility costs reduced by 8 per cent

Energy consumption is trending down under this plan, however, overall GHG emissions are going to remain stagnant from 2022 to 2029 due to the projected increase in grid carbon intensity in Ontario. This value, which is the amount of carbon emissions per unit of electricity generated in Ontario, is expected to go up due to the increased use of natural gas power plants needed in this time while nuclear power plants are going offline for refurbishment. It is anticipated that a GHG reduction of 20 per cent from 2018 by 2029 can be achieved.

Medium-term (2030-2035) and long-term (2035-2050): the focus of the medium and long-term plan is based on the outcomes of the feasibility studies during the 2025-2030 period. During the 2030-2050 timeframe, the following measures are anticipated:

- Fuel switching equipment to low-carbon fuel or renewable energy systems
- Electrification of remaining equipment and building systems
- Expansion of on-site renewable energy systems to offset energy use
- Consider purchasing carbon offsets to meet emissions targets
- Performing regular energy and waste audits to inform capital planning

Through the implementation of the short, medium and long term measures, GHG emissions are expected to decrease by 42 per cent compared to the 2018 baseline by 2035, and 62 per cent reduction by 2050. While the measures are significant, they do not reach the net-zero emission reduction target by 2050 under this ECDMP iteration. Remaining emission sources by 2050 come from heavy-duty fleet fuel, due to lack of feasible low-carbon technologies, and from electricity use, due to the emissions found in the grid.

Future changes in federal and provincial policies, electrical grid decarbonization and technological advances could assist in closing the gap to meeting long-term targets.

A high-level cost estimation to implement the plan was developed to help inform future capital budget planning and decision-making processes

The cost to implement the 2024 ECDMP is \$3.96 million (Table 2) over the next five-year period. Though a cost estimation for the medium and long-term horizon (2030-2050) was performed under the 2024 ECDMP, the plan does not seek funding for projects or initiatives beyond the five-year period. The outcomes of the feasibility studies in the short-term will inform future budget planning for 2030 and beyond.

Table 2: Cost Summary for the 2024 ECDMP for the Short Term (2025-2030)

Measure	Description	Short-Term (0 to 5 years)	Grant Funding Opportunity
Studies			
Net-Zero Pathway Feasibility Study - Facilities	Perform a low-carbon systems feasibility study for Town facilities, such as low-e ceiling, heat pump technology, renewable energy systems etc.	\$250,000	FCM: GHG reduction pathway
Fleet Electrification Feasibility Study	Investigate the feasibility of fleet electrification by assessing the needs of Operations and the capacity of the building infrastructure. Upgrade electrical service as needed to install additional EV charging stations and vehicle replacement costs.	\$250,000	FCM: Municipal Fleet Electrification
Waste audit and waste reduction plan	Perform regular waste audits to identify sources of waste and develop a Waste Reduction Plan	\$50,000	FCM: Waste reduction and diversion
Energy audits	Perform energy audits for Town facilities on a regular cycle to inform capital planning process (every 5 years). The last energy audit was performed in 2018 and will be updated through this study.	\$254,500	FCM: GHG reduction pathway
TOTAL ECDMP (studies)		\$ 804,500	
Capital Projects			
Facilities - retrofits	Measures include: lighting and climate controls measures, pool covers, and boiler replacement.	\$289,019	
Fleet decarbonization	Replace remaining ice resurfacers with electric options, electrification of light duty vehicles and equipment.	\$2,850,000	FCM: Municipal Fleet Electrification
TOTAL ECDMP (Capital projects)		\$ 3,139,019	

Measure	Description	Short-Term (0 to 5 years)	Grant Funding Opportunity
Total ECDMP Recommendations (Studies and Capital)		\$ 3,943,519	
Operating Budget (annual)			
Employee training and capacity building	To support staff training on new technologies, operational measures and other capacity building needs.	\$15,000	
Energy performance monitoring	Monitor each asset's energy consumption to verify that assets are meeting the targets from implementing ECMs.	\$7,000	
TOTAL ECDMP (Operating Budget)		\$22,000	

Advisory Committee Review

A memorandum (Report No. PDS24-049) and Consultant presentation of the draft 2024 ECDMP was brought forth at the Environmental Advisory Committee (EAC) meeting on April 15, 2024. The EAC is in support of the proposed plan and the recommended phasing strategy. A memorandum (Report No. PDS24-052) and full draft 2024 ECDMP was brought to the EAC on May 13, 2024 for any further comment and feedback.

Table 3 lists the EAC comments and considerations into the 2024 ECDMP.

Table 3: EAC Comment Summary

Comments	Responses
Clarifications on the implementation of the Dog Waste Diversion project at Town parks, including volume of waste being collected, as well as the need for public education on impacts of pet waste bag littering.	The comment was passed to Operations for consideration.
Grid electricity security concerns with the electrification process.	The plan includes other on-site renewable sources to reduce grid dependency.
The Town should assess other alternative energy sources, such as waste-heat recovery.	The plan was revised to include other renewable energy sources.
The need for a Town employee shift in habits to conserve energy.	The plan includes staff training and the development of a steering committee.
Staff to investigate occupancy comfort and lighting control at the Town Hall, as well as temperature levels in the Atrium area.	The Town Hall LED lighting retrofit is completed on the first and second floors, including lighting controls. They are set on an optimized occupancy schedule. The third floor lighting retrofits are part of the Town Hall refresh. Funding is available under the approved 2024 Budget for the retrofit but has been put on hold until the

Comments	Responses
	Accommodation Study is complete. The Building Automation System is set on an optimized schedule. Temperature zoning for each office space is not feasible based on the building's current design. Town staff have investigated solutions to minimize the heat transfer from the Atrium windows, and no feasible solutions has been found that maintains the integrity of the infrastructure. The last energy audit was performed in 2018 and implementation of the recommendations is nearing completion. Under the 2024 ECDMP, updated energy audits are recommended which will identify any remaining opportunities for energy conservation.
Existing Town targets are not aggressive enough, and do not align with best practices of net-zero emissions by 2050.	The plan was revised to set net-zero carbon emissions by 2050.
Clarification on how newly acquired Town assets (or major construction) impact the Town's GHG emissions. Consideration for a new building standard such as Passive House, Net-Zero Buildings, etc.	The plan was revised to include the feedback. Impacts of new assets on the Town's GHG emissions was added to the plan. A recommendation for a new Town building design standard is included.
Town should access grants for project implementation (such as FCM).	The plan includes grant opportunities.
The Committee agreed and emphasized the importance that purchasing carbon offsets should be a last resort measure to reach carbon reduction targets.	Added recommendation to develop a town carbon offset purchasing policy to address and/or minimize risks with the reliance on and/or purchasing offset.
The percent GHG increases since 2018 seems high for lighting and water/wastewater.	It was explained that the increase in use has to do with expected population growth but that overall, the increase in GHG emissions is actually very small.
The plan should include benchmarking against other jurisdictions.	The annual energy data submission under the O. Reg. 23/25 includes benchmarking of facility performance with all Ontario municipalities.
Measure and verification of retrofits is important.	Measurement and verification will be included in the scope of work for retrofit projects.
Support was provided for the short, medium and long term targets as a tool to support the plan implementation.	n/a
Concerns regarding the risk of climate action not getting approval through the Town's budget approval process.	Climate action for the short term will be funded through the Town's budget approval process, with the possibility of financial support from external funding.
Transparency being important for tracking progress in the implementing, especially to the public.	The plan fulfills the requirements for the PCP Milestone 1-3, and as part of the PCP commitment, an annual progress report on the status of the plan is required. Any progress reports will be shared to Council and the public.

Legal Considerations

The 2024 ECDMP was prepared in compliance with Ontario Regulation 23/25: Broader Public Sector Energy Reporting and Conservation Demand Management Plans (O.Reg. 25/23). O. Reg. 25/23 requires municipalities to report on municipality-owned buildings energy consumption annually, to develop and implement a conservation demand management plan, and to update their plans every five years. The Town completed its first ECDMP in 2014 and updated it in 2019.

Financial Implications

If the proposed 2024 Energy Conservation and Demand Management Plan is endorsed by Council, the proposed total of \$3,943,519 in capital and \$22,000 in operating costs will be considered as part of the development of the 2025 budget. Of note, the Town's current 2024 10-year capital plan does already include a portion of these proposed initiatives.

Funding sources for these proposed initiatives will be finalized as part of the budget process and will likely result in being funded from tax levy or tax funded reserves. Staff will strive to minimize the financial impact of this action plan by pursuing grant revenue opportunities.

Communications Considerations

In accordance with the O. Reg 23/25, the 2024 ECDMP, once endorsed, will be available for the public to view online on the Town's Website and a physical copy will be made available at the Town Hall. The Town will promote the new plan through its social media platforms and a media release. An annual progress report of the ECDMP will be provided to Council in a staff report and shared on the Town's website for the public to view.

Climate Change Considerations

The 2024 ECDMP creates a roadmap to achieving the Town's corporate greenhouse gas emission targets of net-zero emissions by 2050. Outcomes from the plan support divisional efforts to reducing GHG emissions by providing municipal best practices, energy conservation measures for each division, and support budget cycle activities for the next five-years while informing the 10-year budget and beyond.

The 2024 ECDMP fulfills the Council commitments to the Partner for Climate Protection (PCP) for its corporate emissions, as well as its requirements under the O. Reg. 23/25.

In the short-term, the 2024 ECDMP increases the Town's climate resiliency, by reducing energy demand from the electrical grid through reduced energy demand. The plan increases dependency on electricity in the medium-term which could make the Town more vulnerable to negative impacts of climate change (such as blackouts), but risks are offset through the increased use of renewable energy systems, such as waste-recovery heat systems, solar thermal systems or geothermal heating.

Link to Strategic Plan

This plan supports the Strategic Plan goal of supporting environmental stewardship and sustainability through the promotion and advancement green initiatives and the encouragement of stewardship of Aurora's natural resources.

Alternative(s) to the Recommendation

None.

Conclusions

The 2024 ECDMP initiates a vision towards net-zero GHG emissions by 2050 for Town corporate emissions. The plan reviews past success, best practices, updates the GHG emission inventory, sets reduction targets and outlines a GHG reduction plan to 2050.

Achieving net-zero emission by 2050 requires concerted efforts in change management, ensuring seamless transitions towards greener practices. Deep engagement of stakeholders, including working groups with regular touchpoints, will be instrumental in fostering ownership and support.

Attachments

Attachment 1 – Draft 2024 Energy Conservation and Demand Management Plan (ECDMP)

Attachment 2 - List of completed projects (2019-2023)

Attachment 3 – Presentation of the 2024 Energy Conservation and Demand Management Plan (ECDMP)

Previous Reports

PDS23-115, Memorandum Energy Conservation and Demand Management Plan Renewal, September 18, 2023; and,

PDS23-146, Memorandum Energy Conservation and Demand Management Plan (ECDMP) Project Update, December 11, 2023.

PDS24-049, Memorandum 2024 Energy Conservation and Demand Management Plan Draft Report Presentation, April 15, 2024.

PDS24-052, Memorandum 2024 Energy Conservation and Demand Management Plan draft report, May 13, 2024.

Pre-submission Review

Agenda Management Team review on May 16, 2024

Approvals

Approved by Marco Ramunno, Director, Planning and Development Services

Approved by Doug Nadorozny, Chief Administrative Officer