Committee of the Whole (1) Report

DATE: Tuesday, September 10, 2024 **WARD(S):** ALL

TITLE: PROPOSED 2024 MUNICIPAL ENERGY PLAN

FROM:
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ACTION: DECISION

Purpose

To seek Council endorsement of the Proposed 2024 Municipal Energy Plan.

Report Highlights

- Staff was directed to update the 2016 Municipal Energy Plan.
- The City has set targets to limit greenhouse gas (GHG) emissions to 2-3 tonnes per person by 2030 and achieve net-zero emissions by 2050 at the latest.
- The Proposed 2024 Municipal Energy Plan (the Plan) provides strategies and actions, informed by engagement, to reach the City's climate goals.
- Plan implementation is projected to create a net return of over $6 billion and the equivalent of an annual average of 2,285 additional full-time jobs across Vaughan by 2050.
- Plan implementation can reduce the risk of cancer and other illnesses and improve mental health in Vaughan.
- The Plan includes a carbon budget tool that would integrate GHG emissions with City decision-making and make Vaughan a leader in climate action.
- City staff is actively pursuing many other forms of climate action.

Recommendations

1. That the Proposed 2024 Municipal Energy Plan be endorsed;
2. That staff be directed to implement the actions contained within the Plan; and

3. That staff be directed to work with Communications, Marketing and Engagement to promote the Plan

Background

Vaughan is already experiencing the impacts of climate change, including temperature rise, significant flooding, heatwaves, and decreased air quality

The mean temperature in Vaughan increased by more than 1°C between 1950 and 2022. Vaughan has experienced significant flooding, numerous heat waves, and air quality issues from forest fires in other parts of the province. These climate hazards are projected to increase in severity over the coming years and decades. More extreme weather events will accompany these changes, including more intense rain and snowfall events, flash floods, high winds, and hurricanes.

Based on the current trajectory, climate change will continue to impact Vaughan with projected increases in precipitation, drought, and temperature

Data from the Climate Atlas of Canada predicts an increase in yearly precipitation and heavy rain days which could lead to floods. As well, the precipitation increases are expected in the winter and spring, which could lead to more mixed precipitation events due to temperatures hovering around 0ºC. Meanwhile, summer precipitation is slated to decrease which could lead to drought. By 2050, mean annual temperature is projected to rise by another 2ºC, and the number of extremely hot days (greater than 30°C) are expected to increase from 57 in 2013 to 97 days. Additionally, by 2050, average heatwave length is expected to double to 6 days, compared to 2013, increasing the risk of adverse health impacts, environmental concerns, and crop failures.

In June 2019, Mayor and Members of Council unanimously passed a Members' Resolution to declare a climate emergency in Vaughan

The Climate Change Emergency Declaration was made in response to the Intergovernmental Panel on Climate Change's (IPCC) warning of the intensifying climate emergency. It recognizes the IPCC's assessment that urgent and transformative action needs to occur between now and 2030 to limit the average global temperature increase to 1.5°C, with aggressive actions required to meet net-zero emissions by 2050. The stated purpose of the declaration is to name and deepen Vaughan's commitment to protect the economy, environment, and community from the impacts of climate change.

The City set the targets of reaching 2 to 3 tonnes of greenhouse gas (GHG) emissions per person by 2030 and net-zero emissions by 2050

To meet these goals, Vaughan will need to eliminate 0.86 megatonnes of CO2 equivalent emissions (MtCO2e) by 2030 and 2.6 MtCO2e by 2050. Of these totals, most emissions will come from energy consumption in buildings with the stock of residential

buildings emitting more than commercial and institutional buildings, and Vaughan's industrial buildings emitting the least. The transportation sector is projected to be the second largest GHG emitter over this time frame followed by the waste sector.

It is projected that most community GHG emissions will come from natural gas consumption followed by grid-powered electricity use, diesel, and lastly, gasoline. Natural gas will make up the largest portion of emissions due to its use in buildings. Gasoline based emissions are projected to steadily decline as electric vehicles become more commonly utilized.

The Climate Change Emergency Declaration underlined the importance of updating the 2016 Municipal Energy Plan (MEP) to meet the City's climate targets

Vaughan's MEP is a strategic planning document and action framework that outlines how the City and community can increase energy efficiency, reduce GHG emissions and limit economic risks associated with transitioning to a low-carbon community.

Sustainability Solutions Group (SSG) was retained to update the 2016 MEP and provide official plan policy recommendations through the Municipal Energy Plan Revision (MEPR)

SSG provided the necessary project management, data analysis, and technical expertise to undertake the MEPR process in collaboration with Policy Planning and Special Programs staff. In addition to updating the City's 2016 MEP to reach Vaughan's climate goals, SSG was tasked with providing climate change and sustainability policy recommendations for the City's Official Plan Review to ensure integration between the two processes.

The MEPR was well-integrated with the Vaughan Official Plan Review (OPR)

The City's Official Plan and Municipal Energy Plan are linked, with both influencing key aspects of one another. The MEPR was designed to be well-integrated with the OPR process. As such, SSG reviewed OPR deliverables such as the Climate Change Adaptation and Resiliency Framework and other background papers, as well as forecast data for integration with the MEPR. SSG reviewed the OPR Policy Directions Report and provided policy recommendations to be considered in the updated Official Plan. In addition, community feedback received through the OPR process on climate change and sustainability matters has been closely considered as part of the MEPR as detailed later in this report.

The MEPR was rooted in extensive data collection, analysis and modelling

Staff coordinated with internal City departments, as well as York Region, Alectra, Enbridge, the Municipal Property Assessment Corporation, and Kalibrate Group to

collect the necessary data for the subsequent modelling and analysis. This included data related to demographics and economics, buildings and properties, land use, energy, transportation, wastewater, solid waste, industrial processes, agriculture, water and forestry.

Analysis was undertaken to model and understand recent and planned energy use and emissions in Vaughan

The baseline inventory was developed using the best available data to illuminate the nature of recent energy-use and the resulting community GHG emission patterns and sources. The business-as-planned scenario was then modelled using data, policy information, and informed assumptions. This scenario illustrates the City's expected emissions levels if Vaughan continues with current policies and practices and assumes no additional policy or climate action intervention.

The MEPR was guided by engagement with internal and external technical experts

A technical advisory committee (TAC) was formed at the onset of the project that included representation from many City departments, Vaughan Public Libraries, Toronto and Region Conservation Authority, York Region, Enbridge, and Alectra. Engagement efforts included intensive workshops, circulation of deliverables and additional meetings as necessary. TAC members received information on the MEPR process and climate action planning, and provided input into the modelling assumptions, low-carbon actions, and Implementation Framework.

The public was engaged through a project survey and contest, interactive public workshops, pop-up booths, and a project webpage and email

An online survey was launched to identify opportunities and challenges in updating and implementing the Plan. Two interactive community workshops were held to gain insights into what actions the City and its community members should take to increase energy efficiency, reduce emissions, and mitigate climate change. The survey was incentivized by a contest to win 3-month fitness memberships and single-use activity passes provided by Vaughan's Recreation staff.

Engagement also included pop-up booths at Vaughan's Concerts in the Park event series where Environmental Sustainability staff raised community awareness about the MEPR, provided themed art activities for children, and answered questions and received feedback about climate change and sustainability. Community members were directed to the project webpage: vaughan.ca/MEP to learn more and to submit feedback to mep@vaughan.ca. Engagement efforts were designed, promoted and advertised in

collaboration with Communications, Marketing and Engagement staff to maximize both reach and effectiveness.

The public provided insights into what the City can do to support climate action
The following recommendations were commonly heard through engagement:

- Leverage and expand financial, employment, and transit support for all.
- Adopt an equity lens to ensure climate actions are developed to support equity-seeking and vulnerable community members.
- Encourage sustainable building design, mixed-use and compact development and invest in active transportation.
- Work to raise the community's awareness of climate change and climate actions by providing education on these topics.

More information is available in the ancillary Engagement Plan and Summary Report included as Attachment 4.

The MEPR integrated relevant community feedback from intensive engagement efforts undertaken as part of the OPR
Given the interrelatedness of the two processes, the MEPR was designed to piggyback on OPR engagement efforts to create efficiencies, eliminate redundancy, and reduce community engagement fatigue. The OPR process included intensive community engagement including several meetings, workshops, webinars and events. Relevant feedback collected is summarized as follows:

- Explore opportunities to lower energy consumption in both industry and buildings, including the use of alternative energy sources like solar.
- Support initiatives that allow for energy savings and emissions reductions.
- Increase preparedness for climate emergencies to build resiliency.
- Invest in electric vehicle and electric bicycle infrastructure.
- Improve waste management and recycling policies and practices.
- Continue to address and plan for a changing climate.

Building industry feedback was collected through the review process and engagement efforts from other City projects
The Project Team held a workshop with BILD – York Chapter to inform members of the building industry about the project and provide the opportunity to share insights on the low-carbon actions and options for implementing those actions. The review process also integrated valuable feedback on climate change and sustainability matters gathered

through several workshops with BILD – York Chapter undertaken as part of 2023 Sustainability Metrics Program update process and the ongoing Vaughan OPR process.

Previous Reports/Authority

Related Council materials can be accessed via the following links:

Member's Resolution, June 4, 2019 – Council passed a Member's Resolution to declare a climate emergency and lists actions for climate change mitigation and adaptation.

Council meeting extract, March 22, 2016 – A presentation of the draft 2016 MEP was brought to Working Session and comments were incorporated into the final 2016 MEP.

Analysis and Options

The 2024 Proposed Municipal Energy Plan (the Plan) identifies key actions the City and community can take to reach Vaughan's climate goals

The Plan, included as Attachment 1, consists of the main document, implementation framework and accompanying carbon budget tool. The Plan sets a pathway to reduce per-capita GHG emissions by approximately half by 2030, and to reach the target of net-zero GHG emissions by 2050, while respecting the needs of those who live, work and play in Vaughan. The Plan also considers the role of the City in driving and supporting action, and identifies how citizens, businesses and stakeholders can participate in transitioning Vaughan to a low-carbon community.

The Plan will implement the following priorities previously set by Council in Green Directions Vaughan, the community sustainability plan:

- Goal 1, Objective 1.2: To promote the reduction of community greenhouse gas emissions in the City of Vaughan.
- Goal 2, Objective 2.1: To ensure a climate resilient City and build capacity for local action on climate change.
- Goal 2, Objective 2.3: To create a city with sustainable built form that is compact, resilient and designed to promote citizen health.

A carbon budget is an important tool to consider GHG emissions in decision-making processes and meet climate targets

In 2017, the C40 Cities Climate Leadership Group (C40) published a report in which they assessed the contribution of the C40 cities to the COP21 Paris Agreement's aspirations of limiting global temperature rise to 1.5 or well below 2.0 degrees Celsius. For each city, the report identified GHG emissions reduction pathways and potential actions to achieve these pathways. These city-specific pathways were referred to as

carbon budgets and were an effective way to communicate the urgency of the required emission reductions and became a tool for incorporating GHG emissions into their decision-making processes.

Carbon budgets are driven by emission limits or targets. A ceiling on carbon emissions is established with reference to scientific targets and modelling, and strategies for staying within that ceiling or budget are then developed. A carbon budget is both a mechanism for setting a target and a management system for embedding the consideration of GHG emissions throughout an organization. A carbon budget allows municipalities to make decisions to avoid significant GHG emissions before they are committed to. This proactive approach represents a shift in traditional municipal climate change planning which typically entails trying to mitigate GHG emissions associated with initiatives and projects after they are already operational.

Adopting a carbon budget would make the City a leader in Canadian municipal climate action

In adopting a carbon budget, Vaughan would join a short list of Canadian municipalities taking the lead on this form of climate action. To date, Calgary, Durham, Edmonton, Halifax, Montreal and Whitby have implemented some form of a carbon budget. The City of Toronto is currently working to do the same. Globally, the City of Oslo was the first municipality to adopt a carbon budget having done so in 2017.

The Plan includes a cumulative carbon budget that is broken down into an annual carbon budget

The cumulative carbon budget represents the cumulative emissions for Vaughan between now and 2050. It seeks to align the city's total emissions with its fair share of the remaining global carbon budget that limits warming to 1.5°C.

The annual carbon budget is based on the targeted GHG emissions for a particular year. It is aligned with the cumulative carbon budget and would be integrated with Vaughan's financial budgeting process.

Vaughan will miss its climate goals if it continues on its business-as-planned (BAP) pathway

The BAP pathway shows that although emissions per person are expected to decrease significantly under current policies and practices, increased population and employment in Vaughan will outstrip per person emissions. If the City is to continue along a BAP pathway, overall emissions will decrease by only 23% by 2050, relative to the 2016 baseline. This means further action beyond a BAP pathway must be taken to reach net-zero emissions by 2050.

Vaughan's climate goals are largely attainable under the low-carbon pathway presented in the Plan

The low-carbon pathway is a projected future state in which the amount of carbon emissions is significantly reduced compared to a BAP pathway to mitigate the effects of climate change. This scenario can be achieved through a combination of measures such as increasing the use of clean energy sources, improving energy efficiency, and reducing overall fossil fuel consumption. Implementing Vaughan's low-carbon pathway would reduce per person GHG emissions to 3.3 tonnes per person by 2030 and 0.3 tonnes per person by 2050.

These figures are slightly above the targets of 2 to 3 tCO2e per person by 2030 and net-zero emissions by 2050. This projected gap stems from only including in the low-carbon pathway what is feasible in Vaughan. For example, in the modelling, it is not assumed that everyone will retire gas-powered vehicles within a certain time frame because of the burden it would have on individuals with low or fixed incomes. The pathway also considers that renewable energy sources within Vaughan are limited. In the low-carbon scenario, renewable energy is placed on rooftops and parking lots. However, no ground-based wind and solar farms are located within Vaughan due to the city's rapid urbanization and the importance of leaving natural areas intact.

In both cases, these challenges have the potential to diminish through external factors. Future Provincial and Federal electric vehicle subsidies and rebates could help to speed up the retiring of gas-powered vehicles. Meanwhile, the expansion of power purchase agreements can help to increase the supply of clean electricity to Vaughan's grid.

Vaughan can take action in six key areas to reach its climate goals

Most of Vaughan's emissions are produced by the buildings, transportation and waste sectors. Action in the following areas, or low-carbon pillars, can reduce emissions and implement the Plan's low-carbon pathway: (1) retrofitting buildings; (2) building net-zero new construction; (3) generating renewable energy; (4) reducing vehicle emissions; (5) increasing active transportation and transit use; and (6) reducing waste emissions.

Implementing the Plan can lead to reduced risk of cancer and cardiovascular, endocrine, respiratory, cardiopulmonary, and mental health illnesses in Vaughan

Combusting fossil fuels for energy use releases air pollutants and can create ground-level ozone. These pollutants are breathed in during regular daily activities and can negatively impact human health. Retrofitting existing buildings can also reduce indoor air pollutants, reduce mold and dampness, and improve the thermal comfort of

buildings. These changes can lead to improvements in human health by reducing the risk of several diseases.

The expansion of Vaughan's active transportation network can also lead to positive health outcomes for its residents. Evidence shows increased active transportation and routine physical exercise can lead to improvements in mental health. Increased walking and biking are significant ways to improve a community's physical health.

The local economy would also benefit from implementing the low-carbon scenario. Retrofitting buildings, installing renewable energy, and expanding the construction of active transportation networks all help to create jobs that can be held locally. Decreased utility and fuel costs can also reduce household and business costs, which offsets capital investments in low-carbon assets over time.

In addition to the Plan, the City is actively pursuing additional forms of climate action

- Under Green Directions Vaughan (GDV), milestones are being tracked for the sustainability actions within the GDV. To date, 30 actions are complete, 35 actions are in progress and five actions have not yet begun. In December 2023, data was collected from City departments and York Region to update the 24 quantitative indicators outlined in the GDV.
- Vaughan is an active participant in the Mayors' Megawatt Challenge, a network of municipalities that take part in benchmarking and assessment reports, and energy and water reporting. The initiative also has energy efficiency challenges such as the Community Centre Challenge and Town Hall Challenge.
- The Climate Change Adaptation and Resilience Framework (CCARF) was finalized in August 2022. A Vulnerability and Risk Assessment was completed as a component of the CCARF. Both the assessment and the CCARF provided recommendations for the Official Plan Review.
- A Local Improvement Charges Study to enable energy efficiency retrofits in private buildings was completed and approved by Council. Staff is exploring implementation options for a City-managed energy retrofit program.
- In May 2022, Council approved the updated Sustainability Metrics Program (SMP) which features threshold scores and minimum sustainability performance levels that must be achieved for new developments in Vaughan. The SMP and threshold performance levels are aligned with partner municipalities to ensure a level playing field and streamlined process for all development across the cities of Richmond Hill, Markham, Brampton, and Vaughan.

- In collaboration with the ClimateWise Business Network, Vaughan has improved compliance with and reporting to Ontario Regulation 506/18, Energy and Water Reporting and Benchmarking (EWRB) in the commercial sector.
- In 2022, the City was presented with the Mayor's Energy Challenge Advocate Award for demonstrating climate leadership by conducting a survey with commercial building owners, developing intelligence on the sector as well as awareness of the EWRB program, and also including participation in the EWRB as a reporting metric in Vaughan's Climate Emergency Declaration.
- The City continues to implement the Sustainable Neighborhood Action Program (SNAP) in the Thornhill area in partnership with the Toronto and Region Conservation Authority (TRCA) and local resident groups. In June 2023, the City and the TRCA entered into a new Service Level Agreement to continue implementation of the climate resiliency projects identified in the Action Plan.
- Climate resiliency is becoming an increasingly strong component of work in the Parks, Forestry and Horticulture department. Environmental Sustainability staff provided comment on the recently published Urban Forest Management Plan and sit on the Greenspace Strategic Plan Technical Advisory Committee. Our two departments partnered on a tree planting event in 2023 and will do so again on two more tree planting events in the fall of 2024.

Meeting Vaughan's climate goals requires action from the City, the public, the building community and other stakeholders

The Plan presents specific actions to be undertaken by the community, in addition to those to be undertaken by the City, that consider feedback received to-date. Policy Planning and Special Programs staff will work with Communications, Marketing and Engagement and other departments to further promote, educate, and implement these actions in collaboration with members of the public, the building industry, and other stakeholders.

A net return of over $6 billion across Vaughan by 2050 is projected to be generated by implementing the Proposed 2024 MEP

This expected net return for the low-carbon pathway is larger than the business-as-planned scenario. It is based on revenue generation, and savings in operations, maintenance, and energy costs. Financial modelling was completed by SSG as part of their work on the MEPR.

The equivalent average of 2,285 additional full-time jobs would be created annually between 2024 and 2050 in the low-carbon scenario

This is modelled as 59,423 person-years of employment above what would be created in the business-as-planned scenario. Retrofitting buildings, installing renewable energy, building net-zero new construction, increasing transit use and expanding the construction of active transportation networks all help to create local job opportunities.

Financial Impact

Funding for Plan implementation is available through the Ministry of Energy and other mechanisms

Environmental Sustainability staff can apply for $25,000 in funding available through the Provincial Municipal Energy Plan program. The Plan's Implementation Framework provides high level guidance for the funding mechanisms and amounts necessary to support the six key actions. The Implementation Framework also details funding opportunities and potential stakeholders, collaborators and partners who will take on some of the financial obligations. Staff will continue to assess the financial impacts of Plan implementation and report back as necessary.

The carbon budget would be integrated with the City's financial budgeting and decision-making processes

If adopted and successfully implemented, all capital budget project line items would include a column indicating the anticipated GHG emissions that would be considered when deciding whether or not to pursue a particular capital project.

Broader Regional Impacts/Considerations

The MEPR aligns the City with York Region's climate targets as detailed in the Region's Climate Change Action Plan, and more specifically with York Region's goal of achieving net-zero emissions by 2050. Further, York Region's Priority Action Areas of resilient communities and infrastructure, low-carbon living, and supporting an equitable transition also align with details within the six low-carbon pillars in the MEPR. Effective climate action is also consistent with York Region's Official Plan and its report entitled "Renewing York Region's Vision: Strong, Caring, Safe Communities".

Vaughan would become part of a growing trend of Canadian municipalities pursuing innovative climate action in the form of a carbon budget. Staff can share this accomplishment and encourage others to take part through our continued role in the Joint York Region and Local Municipal Climate Change Meeting Group, and the Clean Air Council's Energy Managers Community of Practice Working Group, and Roundtable.

Operational Impact

Effective climate leadership will require action across all City departments

Staff from various City departments were engaged throughout the MEPR and on the Implementation Framework and carbon budget, as many actions involve internal departments. Staff were circulated on deliverables for comment and were made aware of their roles. Further, implementation of the carbon budget will provide an additional layer of information and analysis to capital budget decisions and long-term decision making in the City. Policy Planning and Special Programs staff will train other departments on the implementation tools and provide support.

Conclusion

Council endorsement of the Proposed 2024 Municipal Energy Plan (the Plan) is necessary to reach the City's climate goals, create a low-carbon economy and resilient city, and mitigate the climate crisis. Implementation of the Plan is projected to create a net return of over $6 billion across Vaughan and an average of 2,285 full-time jobs will be created annually above the business-as-planned scenario by 2050. Implementation can also reduce the risk of cancer and other illnesses and improve mental health in Vaughan.

Integration of the carbon budget in City decision-making processes will not only help the City accurately and accountably track its progress in reaching its climate targets but will also make Vaughan a role model in municipal sustainability. Limiting the worst effects of climate change is still possible if Vaughan continues to demonstrate leadership, and join and inspire others in pursuing bold climate action.

For more information, please contact Will Baigent, Energy and Climate Change Specialist at ext. 3789.

Attachments

1. City of Vaughan Municipal Energy Plan Revision, Sustainable Solutions Group, June 2024.
2. City of Vaughan Carbon Budget, Sustainable Solutions Group, June 2024.
3. City of Vaughan Municipal Energy Plan Presentation, Sustainable Solutions Group, June 2024.
4. City of Vaughan Municipal Energy Plan Ancillary Report: Engagement Plan and Summary, Sustainable Solutions Group, June 2024.

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