

**REPORT 19
27 OCTOBER 2021**

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| <p>1. RELEASE OF THE BETTER BUILDINGS OTTAWA STRATEGY AND
LAUNCH OF THE BENCHMARKING AND AUDITING PROGRAM</p> <p>DIFFUSION DE LA STRATÉGIE D'AMÉLIORATION DES BÂTIMENTS
D'OTTAWA ET LANCEMENT DU PROGRAMME D'ANALYSE
COMPARATIVE ET DE VÉRIFICATION</p> |
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COMMITTEE RECOMMENDATIONS

That Council:

- 1. Approve the Better Buildings Ottawa Strategy attached as Document 1 and summarized in this report;**
- 2. Approve and direct staff to launch the Benchmarking and Auditing Program, attached as Document 2 and summarized in this report;**
- 3. Direct the Council Sponsors Group to work with the Mayor to request the Government of Ontario to:**
 - a) Amend the province's Reporting of Energy Consumption and Water Use (O.Reg. 506/18) regulation to mandate industrial, commercial, institutional and multi-unit residential buildings of 1,850 m² (approximately 20,000 ft²) or larger and other building types to report their energy consumption and water use, and to expand the scope of the regulation to include energy, water and greenhouse gas emissions disclosure at the address level;**
 - b) Implement a net zero retrofit code;**
 - c) Provide authority for municipalities to mandate energy and emissions performance standards should the Government of Ontario not amend its Energy Consumption and Water Use regulation;**

- d) **Create grant and/or rebate programs to improve the business case for deep retrofits with longer paybacks for all building types; and**
 - e) **Demonstrate leadership through deep carbon retrofits in provincially-owned or leased buildings in Ottawa.**
- 4. Direct staff to report back to Council on the City's legislative authority and implementation plan to require the following for existing commercial, institutional and multi-unit residential buildings of 1,850 m² (approximately 20,000 ft²) or larger should the Government of Ontario not amend its Energy Consumption and Water Use regulation:**
 - a) **Mandatory annual energy, water, and greenhouse gas emission benchmarking and disclosure;**
 - b) **Mandatory energy and emissions audits and/or recommissioning reports, and retrofit plans; and**
 - c) **Mandatory emissions or energy performance targets.**
- 5. Direct the Council Sponsors Group to work with the Mayor to request the Government of Ontario to direct the Ontario Energy Board (OEB) and Independent Electricity System Operator (IESO) to:**
 - a) **Implement rate structure changes that favour electrification and fuel switching away from natural gas;**
 - b) **Fund electrical service upgrades that are required for Green House Gas (GHG) reduction purposes through the rate base;**
 - c) **Develop utility mechanisms to help support and invest in deep emissions retrofits; and**
 - d) **Continue retrofit cost reduction measures, such as performance-based rebates for improved energy and emission performance.**

- 6. Direct the Council Sponsors Group to work with the Mayor to request the Government of Canada to:**
- a) Release a model retrofit code that aligns with the targets set in the Paris Agreement;**
 - b) Set standards for low embodied carbon materials including concrete and steel and low global warming potential refrigerants;**
 - c) Continue its commitment to carbon pricing via the *Greenhouse Gas Pollution Pricing Act*;**
 - d) Create/expand grant programs and tax incentives to improve the business case for deep retrofits with long payback periods;**
 - e) Work with municipalities to ensure rebates and financing for deep emissions retrofits include providing a loan backstop for municipal retrofit financing programs for private buildings;**
 - f) Continue the enhancement of deep retrofit financing in collaboration with municipalities through the Canadian Infrastructure Bank; and**
 - g) Support the manufacturing and supply chains to increase availability of low embodied carbon materials for the building industry.**

DIRECTION TO STAFF

That staff be directed to study how the City's Bird-Safe Design Guidelines and related bird collision mitigation measures can be integrated with the Better Buildings Strategy and financial support framework. There is significant overlap between energy efficiency retrofits and bird-safe design changes, such as replacing existing windows/glass surfaces and lighting upgrades. There are

financial, environmental and wildlife conservation benefits and efficiencies achieved by integrating bird-safe design measures into a building retrofit.

RECOMMANDATIONS DU COMITÉ

Que le Conseil :

- 1. Approuve la Stratégie d'amélioration des bâtiments d'Ottawa, ci-jointe en tant que document 1 et résumée dans le présent rapport;**
- 2. Approuve le Programme d'analyse comparative et de vérification, ci-joint en tant que document 2 et résumé dans le présent rapport, et charger le personnel de son lancement;**
- 3. Charge le Groupe de conseillers parrains de collaborer avec le maire en vue d'adresser les demandes suivantes au gouvernement de l'Ontario :**
 - a) modifier la réglementation entourant les rapports sur la consommation d'énergie et l'utilisation de l'eau de la province (Règlement de l'Ontario 506/18) afin de contraindre les propriétaires de bâtiments industriels, commerciaux, institutionnels et polyvalents de 1 850 m² (environ 20 000 pi²) ou plus et d'autres types de bâtiment à fournir leur consommation d'énergie et d'eau, et d'élargir la portée de cette réglementation de manière à englober la déclaration pour chaque adresse des données sur l'énergie, l'eau et les émissions de gaz à effet de serre;**
 - b) mettre en place un code de modernisation à énergie nette zéro;**
 - c) donner aux municipalités le pouvoir d'établir des normes énergétiques et de rendement des émissions dans le cas où le gouvernement de l'Ontario ne modifierait pas sa**

- réglementation sur la consommation d'énergie et l'utilisation de l'eau;
- d) créer des programmes de subvention et/ou de remises d'impôt afin d'améliorer l'analyse de rentabilité des modernisations en profondeur, avec des périodes de recouvrement plus longues pour tous les types de bâtiment; et
 - e) faire preuve de leadership en apportant des modernisations en profondeur à faible émission de carbone aux bâtiments que la province possède ou loue à Ottawa.
4. Enjoigne au personnel de rendre compte au Conseil sur l'autorité législative de la Ville et le plan de mise en œuvre permettant d'exiger les conditions suivantes auprès des propriétaires de bâtiments commerciaux, institutionnels et polyvalents existants de 1 850 m² (environ 20 000 pi²) ou plus, dans le cas où le gouvernement de l'Ontario ne modifierait pas sa réglementation sur la consommation d'énergie et l'utilisation de l'eau :
- a) analyse comparative et déclaration obligatoires annuelles des données sur l'énergie, l'eau et les émissions de gaz à effet de serre;
 - b) obligation de vérifications énergétiques et de la production d'émissions et/ou de rapports d'optimisation des systèmes électromécaniques, et de plans de modernisation; et
 - c) obligation d'objectifs relatifs aux émissions ou au rendement énergétique.
5. Charge le Groupe de conseillers parrains de collaborer avec le maire en vue d'enjoindre au gouvernement de l'Ontario de demander ce qui suit à la Commission de l'énergie de l'Ontario et

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**à la Société indépendante d'exploitation du réseau d'électricité
(IESO) :**

- a) apporter des modifications à la structure tarifaire afin de favoriser l'électrification et le remplacement des combustibles comme le gaz naturel;**
 - b) financer des projets de mise à niveau des services électriques nécessaire pour réduire les émissions de GES grâce à la base tarifaire;**
 - c) doter les services publics de mécanismes pour étayer les travaux de modernisation énergétique en profondeur et y investir; et**
 - d) poursuivre l'application de mesures de réduction des coûts de modernisation, notamment des remises fondées sur le rendement de réduction énergétique et d'émissions.**
- 6. Charge le Groupe de conseillers parrains de collaborer avec le maire en vue d'adresser les demandes suivantes au gouvernement du Canada :**
- a) mettre en place un modèle de code de modernisation correspondant aux objectifs fixés lors de l'Accord de Paris;**
 - b) établir des normes relatives aux matières carbonées à faible énergie intrinsèque, notamment le béton et l'acier, et les réfrigérants à faible potentiel de réchauffement de la planète;**
 - c) poursuivre son engagement envers la tarification du carbone, par le biais de la Loi sur la tarification de la pollution causée par les gaz à effet de serre;**
 - d) créer ou élargir des programmes de subvention et/ou de remises d'impôt afin d'améliorer l'analyse de rentabilité des**

modernisations en profondeur, avec des périodes de recouvrement plus longues;

- e) collaborer avec les municipalités pour s'assurer que les remises et le financement des améliorations énergétiques substantielles soient assortis d'une garantie de prêt pour les programmes de financement de projets municipaux de modernisation des bâtiments privés;**
- f) poursuivre l'amélioration du financement des modernisations en profondeur, en collaboration avec les municipalités, par le biais de la Banque de l'infrastructure du Canada; et**
- g) soutenir la fabrication et les chaînes d'approvisionnement afin d'améliorer la disponibilité des matières carbonées à faible énergie intrinsèque pour l'industrie de la construction.**

INSTRUCTION AU PERSONNEL

Que l'on demande au personnel d'étudier de quelle façon les Lignes directrices en matière de conception sécuritaire pour les oiseaux et les mesures connexes d'atténuation des collisions d'oiseaux peuvent être intégrées à la Stratégie d'amélioration des bâtiments et au cadre de financement. Il y a d'importants chevauchements entre les rénovations écoénergétiques et la conception sécuritaire pour les oiseaux (remplacement des fenêtres et des surfaces de verre, amélioration de l'éclairage, etc.). La prise en compte des principes de conception sécuritaire pour les oiseaux lors de la rénovation d'un bâtiment présente de nombreux avantages sur les plans des finances, de l'environnement et de la conservation de la faune et se traduit par des gains d'efficacité.

DOCUMENTATION

1. Director's Report, Economic Development and Long Range Planning, Planning, Infrastructure and Economic Development Department, dated 6 October 2021 (ACS2021-PIE-EDP-0037).

Rapport du directeur, Développement Économique et Planification à long terme, Direction générale de la planification, de l'infrastructure et du développement économique, daté le 6 octobre 2021 (ACS2021-PIE-EDP-0037).

2. Extract of Draft Minutes, Standing Committee on Environmental Protection, Water and Waste Management, 19 October 2021.

Extrait de l'ébauche du procès-verbal, Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets, le 19 octobre 2021.

**STANDING COMMITTEE ON
ENVIRONMENTAL PROTECTION,
WATER AND WASTE MANAGEMENT**

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**COMITÉ PERMANENT DE LA
PROTECTION DE
L'ENVIRONNEMENT, DE L'EAU ET
DE LA GESTION DES DÉCHETS
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LE 27 OCTOBRE 2021**

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**Report to
Rapport au:**

**Standing Committee on Environmental Protection, Water and Waste Management
Comité permanent de la protection de l'environnement, de l'eau et de la gestion
des déchets**

19 October 2021 / 19 octobre 2021

**and Council
et au Conseil**

27 October 2021 / 27 octobre 2021

**Submitted on October 6, 2021
Soumis le 6 octobre 2021**

**Submitted by
Soumis par:
Don Herweyer**

Director / directeur

**Economic Development and Long Range Planning/ Développement Économique
et Planification à long terme, Planning, Infrastructure and Economic Development
Department / Direction générale de la planification, de l'infrastructure et du
développement économique**

Contact Person

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**Ward: CITY WIDE / À L'ÉCHELLE DE LA
VILLE**

File Number: ACS2021-PIE-EDP-0037

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SUBJECT: Release of the Better Buildings Ottawa Strategy and Launch of the Benchmarking and Auditing Program

OBJET: Diffusion de la Stratégie d'amélioration des bâtiments d'Ottawa et lancement du Programme d'analyse comparative et de vérification

REPORT RECOMMENDATIONS

That the Standing Committee on Environmental Protection, Water and Waste Management recommend that Council:

- 1. Approve the Better Buildings Ottawa Strategy attached as Document 1 and summarized in this report;**
- 2. Approve and direct staff to launch the Benchmarking and Auditing Program, attached as Document 2 and summarized in this report;**
- 3. Direct the Council Sponsors Group to work with the Mayor to request the Government of Ontario to:**
 - a) Amend the province's Reporting of Energy Consumption and Water Use (O.Reg. 506/18) regulation to mandate industrial, commercial, institutional and multi-unit residential buildings of 1,850 m² (approximately 20,000 ft²) or larger and other building types to report their energy consumption and water use, and to expand the scope of the regulation to include energy, water and greenhouse gas emissions disclosure at the address level;**
 - b) Implement a net zero retrofit code;**
 - c) Provide authority for municipalities to mandate energy and emissions performance standards should the Government of Ontario not amend its Energy Consumption and Water Use regulation;**
 - d) Create grant and/or rebate programs to improve the business case for deep retrofits with longer paybacks for all building types; and**
 - e) Demonstrate leadership through deep carbon retrofits in provincially-owned or leased buildings in Ottawa.**

- 4. Direct staff to report back to Council on the City's legislative authority and implementation plan to require the following for existing commercial, institutional and multi-unit residential buildings of 1,850 m² (approximately 20,000 ft²) or larger should the Government of Ontario not amend its Energy Consumption and Water Use regulation:
 - a) Mandatory annual energy, water, and greenhouse gas emission benchmarking and disclosure;**
 - b) Mandatory energy and emissions audits and/or recommissioning reports, and retrofit plans; and**
 - c) Mandatory emissions or energy performance targets.****
- 5. Direct the Council Sponsors Group to work with the Mayor to request the Government of Ontario to direct the Ontario Energy Board (OEB) and Independent Electricity System Operator (IESO) to:
 - a) Implement rate structure changes that favour electrification and fuel switching away from natural gas;**
 - b) Fund electrical service upgrades that are required for Green House Gas (GHG) reduction purposes through the rate base;**
 - c) Develop utility mechanisms to help support and invest in deep emissions retrofits; and**
 - d) Continue retrofit cost reduction measures, such as performance-based rebates for improved energy and emission performance.****
- 6. Direct the Council Sponsors Group to work with the Mayor to request the Government of Canada to:
 - a) Release a model retrofit code that aligns with the targets set in the Paris Agreement;**
 - b) Set standards for low embodied carbon materials including concrete and steel and low global warming potential refrigerants;****

- c) Continue its commitment to carbon pricing via the *Greenhouse Gas Pollution Pricing Act*;**
- d) Create/expand grant programs and tax incentives to improve the business case for deep retrofits with long payback periods;**
- e) Work with municipalities to ensure rebates and financing for deep emissions retrofits include providing a loan backstop for municipal retrofit financing programs for private buildings;**
- f) Continue the enhancement of deep retrofit financing in collaboration with municipalities through the Canadian Infrastructure Bank; and**
- g) Support the manufacturing and supply chains to increase availability of low embodied carbon materials for the building industry.**

RECOMMANDATIONS DU RAPPORT

Que le Comité permanent de la protection de l'environnement, de l'eau et de la gestion des déchets recommande ce qui suit au Conseil :

- 1. Approuver la Stratégie d'amélioration des bâtiments d'Ottawa, ci-jointe en tant que document 1 et résumée dans le présent rapport;**
- 2. Approuver le Programme d'analyse comparative et de vérification, ci-joint en tant que document 2 et résumé dans le présent rapport, et charger le personnel de son lancement;**
- 3. Charger le Groupe de conseillers parrains de collaborer avec le maire en vue d'adresser les demandes suivantes au gouvernement de l'Ontario :**
 - a) modifier la réglementation entourant les rapports sur la consommation d'énergie et l'utilisation de l'eau de la province (Règlement de l'Ontario 506/18) afin de contraindre les propriétaires de bâtiments industriels, commerciaux, institutionnels et polyvalents de 1 850 m² (environ 20 000 pi²) ou plus et d'autres types de bâtiment à fournir leur consommation d'énergie et d'eau, et d'élargir la portée de cette réglementation de manière à englober la déclaration pour**

chaque adresse des données sur l'énergie, l'eau et les émissions de gaz à effet de serre;

- b) mettre en place un code de modernisation à énergie nette zéro;
 - c) donner aux municipalités le pouvoir d'établir des normes énergétiques et de rendement des émissions dans le cas où le gouvernement de l'Ontario ne modifierait pas sa réglementation sur la consommation d'énergie et l'utilisation de l'eau;
 - d) créer des programmes de subvention et/ou de remises d'impôt afin d'améliorer l'analyse de rentabilité des modernisations en profondeur, avec des périodes de recouvrement plus longues pour tous les types de bâtiment; et
 - e) faire preuve de leadership en apportant des modernisations en profondeur à faible émission de carbone aux bâtiments que la province possède ou loue à Ottawa.
- 4. Enjoindre au personnel de rendre compte au Conseil sur l'autorité législative de la Ville et le plan de mise en œuvre permettant d'exiger les conditions suivantes auprès des propriétaires de bâtiments commerciaux, institutionnels et polyvalents existants de 1 850 m² (environ 20 000 pi²) ou plus, dans le cas où le gouvernement de l'Ontario ne modifierait pas sa réglementation sur la consommation d'énergie et l'utilisation de l'eau :**
- a) analyse comparative et déclarations obligatoires annuelles des données sur l'énergie, l'eau et les émissions de gaz à effet de serre;
 - b) obligation de vérifications énergétiques et de la production d'émissions et/ou de rapports d'optimisation des systèmes électromécaniques, et de plans de modernisation; et
 - c) obligation d'objectifs relatifs aux émissions ou au rendement énergétique.
- 5. Charger le Groupe de conseillers parrains de collaborer avec le maire en vue d'enjoindre au gouvernement de l'Ontario de demander ce qui suit à la**

**Commission de l'énergie de l'Ontario et à la Société indépendante
d'exploitation du réseau d'électricité (IESO) :**

- a) **apporter des modifications à la structure tarifaire afin de favoriser l'électrification et le remplacement des combustibles comme le gaz naturel;**
 - b) **financer des projets de mise à niveau des services électriques nécessaire pour réduire les émissions de GES grâce à la base tarifaire;**
 - c) **doter les services publics de mécanismes pour étayer les travaux de modernisation énergétique en profondeur et y investir; et**
 - d) **poursuivre l'application de mesures de réduction des coûts de modernisation, notamment des remises fondées sur le rendement de réduction énergétique et d'émissions.**
- 6. Charger le Groupe de conseillers parrains de collaborer avec le maire en vue d'adresser les demandes suivantes au gouvernement du Canada :**
- a) **mettre en place un modèle de code de modernisation correspondant aux objectifs fixés lors de l'Accord de Paris;**
 - b) **établir des normes relatives aux matières carbonées à faible énergie intrinsèque, notamment le béton et l'acier, et les réfrigérants à faible potentiel de réchauffement de la planète;**
 - c) **poursuivre son engagement envers la tarification du carbone, par le biais de la *Loi sur la tarification de la pollution causée par les gaz à effet de serre*;**
 - d) **créer ou élargir des programmes de subvention et/ou de remises d'impôt afin d'améliorer l'analyse de rentabilité des modernisations en profondeur, avec des périodes de recouvrement plus longues;**
 - e) **collaborer avec les municipalités pour s'assurer que les remises et le financement des améliorations énergétiques substantielles soient**

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assortis d'une garantie de prêt pour les programmes de financement de projets municipaux de modernisation des bâtiments privés;

f) poursuivre l'amélioration du financement des modernisations en profondeur, en collaboration avec les municipalités, par le biais de la Banque de l'infrastructure du Canada; et

g) soutenir la fabrication et les chaînes d'approvisionnement afin d'améliorer la disponibilité des matières carbonées à faible énergie intrinsèque pour l'industrie de la construction.

EXECUTIVE SUMMARY

This report responds to Council's direction to implement the 20 priority projects in the Energy Evolution Strategy. This report proposes a Strategy and an initial Program to accelerate the retrofits of large, private industrial, commercial, institutional, and multi-unit residential buildings.

This report and its attached documents include:

1. A description of the role of large building retrofits in meeting Ottawa's target to reduce greenhouse gas (GHG) emissions 100 per cent by 2050 and the opportunity for the municipality to catalyze those retrofits;
2. An overview of the Better Buildings Ottawa Strategy that outlines the various steps to transition these buildings to a low carbon future and the possible catalyst role for the City; and
3. An overview of the proposed Better Buildings Ottawa Benchmarking and Auditing Program, including eligibility criteria, application process, program delivery, budget, benefits, and steps to launch.

Key Insights from the Better Buildings Ottawa Strategy

- The Better Buildings Ottawa Strategy identifies how to encourage and regulate deep GHG reduction retrofits in commercial, institutional, and industrial (ICI) buildings as well as large multi-unit residential buildings (MURBs). This includes all buildings in Part 3 of the Ontario Building Code (referred to collectively as Part 3 buildings hereafter), excluding those

owned or operated by the City of Ottawa since they are dealt with under a separate Municipal Building Retrofit strategy.

- Existing Part 3 buildings are a large source of GHG emissions in Ottawa, contributing 22 per cent of the GHG emissions in 2019. Since most of these emissions are associated with space heating, effective emissions reduction programs for Ottawa focus on reducing and decarbonizing space heating in buildings.
- The Strategy calls for a 50 to 60 per cent energy reduction in Part 3 buildings over business as planned by 2040. This requires deep energy retrofits of almost all private buildings in Ottawa.
- Retrofits must reduce demand, mainly through building envelope upgrades, before fuel switching, to mitigate electricity cost increases and to ensure that the electrical grid has capacity to absorb the heating load.
- Retrofits alone will not achieve net zero. A clean electrical grid must accompany the building retrofits to achieve the GHG reduction targets.
- The cost of the needed retrofit actions represents a significant net investment for building owners and some of these measures do not pay back on their own. Financial supports are expected to be needed to enable market transformation.
- Analysis to date suggests that office buildings offer the greatest emissions reduction potential at the least cost, so a targeted program may stimulate activity in the office building sector without significant incentives.
- Multi-family residential buildings (MURBs) require more financial and capacity support to achieve the GHG reductions targets, making MURBs a clear priority sector to target with incentives.
- Based on experience from other jurisdictions, regulations are expected to be required to achieve the GHG reductions from buildings in the timeframe available; voluntary measures alone are not expected to be sufficient to drive the required pace of market transformation.

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- The City does not have all of the authorities needed to implement the Better Buildings Ottawa Strategy in full. Dialogue with the senior levels of government will be necessary and specific topics for discussion are recommended in this Report. The recommendations pertaining to senior levels of government in this report are aligned with those approved by the City of Toronto in their [Net Zero Existing Buildings Strategy](#).

Key Elements of the Benchmarking and Auditing Program

Given that municipalities are uniquely positioned to catalyze retrofits of private buildings through policies and programs, that benchmarking has proven to drive retrofits in other jurisdictions, and that thermal audits are showing promise as a useful tool worthy of demonstration, the benchmarking and auditing Program proposes to use subsidized thermal audits as a way to entice building owners to participate in the benchmarking and disclosure challenge.

Experience from leading jurisdictions has shown that benchmarking programs can improve energy efficiency by approximately 3 per cent per year. It has also been found to facilitate a maturation of the industry by creating a culture of awareness of emissions amongst building owners, tenants, and investors.

The Benchmarking and Auditing Program is proposed to be delivered through a combination of existing staff and external service delivery partners which will be procured through standard procurement channels. Funding is being sought from Federation of Canadian Municipalities (FCM) to augment the scope of the Program.

If approved, staff propose to launch the Benchmarking and Auditing Program in Q4 2021 for an initial term of one year. Extensions beyond that initial term are expected but will depend on success to date and funds available. Reporting to Council on the impact of the Program will be included in the annual Climate Change Master Update report.

Financial Implications

Recommendations 1 and 3 to 6: There are no direct financial implication.

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Recommendation 2: Estimated costs for the Benchmarking and Auditing Program are \$298,000. Estimates are for thermal scans, virtual audits, data analysis and capacity building services. Funds are available within 908880 Energy Evolution.

Public Consultation/Input

Stakeholders were provided opportunities to comment on this Strategy and Program in three formats: reviewing draft versions of documents, surveys, and through consultation meetings. Two surveys were conducted. The first was conducted between December 2020 and February 2021; the second between August and September 2021.

The Energy Evolution Buildings Technical Working Group was given a presentation and invited to provide feedback in January 2021. The Building Owners and Managers Association was given a presentation and invited to provide feedback in February 2021. A Commercial Building Retrofit Working Group was established in July 2021 to provide input on the Strategy and implementation plan.

RÉSUMÉ

Le présent rapport fait suite à la directive du Conseil de mettre en œuvre les 20 projets prioritaires de la stratégie Évolution énergétique. Il propose une stratégie et un programme initial visant à accélérer les travaux de modernisation des grands bâtiments industriels, commerciaux et institutionnels privés, ainsi que des immeubles résidentiels à logements multiples.

Le présent rapport et les documents qui y sont joints proposent ce qui suit :

1. Une description du rôle de la modernisation des grands bâtiments dans l'atteinte de l'objectif de la Ville d'Ottawa de réduire de *100 pour cent*, d'ici 2050, les émissions de gaz à effet de serre (GES), et de la possibilité pour la municipalité de catalyser ces rénovations;
2. Un aperçu de la Stratégie d'amélioration des bâtiments d'Ottawa, qui décrit les diverses étapes de transition de ces bâtiments vers un avenir faible en carbone et l'éventuel rôle de catalyseur de la Ville; et
3. Un aperçu du Programme d'analyse comparative et de vérification dans le cadre de la Stratégie d'amélioration des bâtiments d'Ottawa, notamment les critères

d'admissibilité, le processus de demande, la réalisation du programme, son budget, ses avantages et les étapes de sa mise en route.

Principales idées de la Stratégie d'amélioration des bâtiments d'Ottawa

- La Stratégie d'amélioration des bâtiments d'Ottawa a pour objet de déterminer comment encourager et réglementer les travaux de modernisation en profondeur destinés à réduire les émissions de GES des bâtiments commerciaux, institutionnels et industriels, ainsi que des grands immeubles résidentiels à logements multiples. Ces bâtiments comprennent ceux visés par la partie 3 *du Code du bâtiment de l'Ontario* (ci-après nommés bâtiments de la partie 3), sauf ceux que la Ville d'Ottawa possède ou exploite, car ils sont soumis à une stratégie distincte d'amélioration des bâtiments municipaux.
- Les bâtiments de la partie 3 existants représentent une source importante d'émissions de GES à Ottawa, ayant contribué à hauteur 22 pour cent aux émissions de GES en 2019. Puisque la plupart de ces émissions sont associées au chauffage des espaces de vie, les programmes de réduction des émissions efficaces pour Ottawa se focalisent sur la réduction et la décarbonisation du chauffage des espaces de vie dans les bâtiments.
- La Stratégie préconise une réduction énergétique de l'ordre de 50 à 60 pour cent dans les bâtiments de la partie 3, selon les prévisions allant jusqu'en 2040. Cet objectif requiert la rénovation énergétique en profondeur de presque tous les bâtiments privés d'Ottawa.
- Les travaux de modernisation doivent permettre une réduction de la demande, essentiellement grâce à la rénovation des enveloppes de bâtiment, avant le remplacement des combustibles, afin d'atténuer les hausses de coût de la consommation électrique et de s'assurer que le réseau électrique a la capacité d'absorber la charge calorifique.
- Les travaux de modernisation ne pourront pas à eux seuls permettre d'atteindre une énergie nette zéro. Un réseau électrique propre doit accompagner les projets de modernisation des bâtiments afin d'atteindre les objectifs de réduction de GES.

- Le coût des projets de modernisation nécessaires représente un investissement net important pour les propriétaires de bâtiment, et certaines des mesures appliquées ne sont pas rentables par elles-mêmes. Des programmes de soutien financier risquent d'être nécessaires pour favoriser une transformation du marché.
- Les analyses faites à ce jour suggèrent que les immeubles de bureaux offrent le plus grand potentiel de réduction d'émissions au plus faible coût, ce qui laisse penser qu'un programme ciblé pourrait stimuler l'activité dans le secteur des immeubles de bureaux sans incitatif important.
- Les immeubles résidentiels à logements multiples requièrent un plus grand soutien financier et de capacité pour parvenir aux objectifs de réduction d'émissions de GES, une situation qui rend prioritaire ce type d'immeuble pour les programmes incitatifs.
- Au vu de l'expérience observée dans d'autres administrations, il faudrait mettre en place une réglementation permettant une réduction des émissions de GES provenant des bâtiments dans le délai prévu; des mesures volontaires ne devraient pas, à elles seules, suffire pour donner le rythme requis pour une transformation du marché.
- La Ville ne détient pas tous les pouvoirs nécessaires pour mettre intégralement en œuvre la Stratégie d'amélioration des bâtiments d'Ottawa. Des échanges avec les paliers supérieurs du gouvernement seront nécessaires et des sujets de discussion en particulier sont recommandés dans le présent rapport. Les recommandations du présent rapport qui concernent les paliers supérieurs du gouvernement sont en adéquation avec celles approuvées par la Ville de Toronto dans sa [Stratégie sur les bâtiments existants à émissions nettes zéro](#).

Principaux éléments du Programme d'analyse comparative et de vérification

Compte tenu du fait que les municipalités occupent une position particulière pour catalyser les projets de modernisation de bâtiments privés par le biais de politiques et de programmes, que les analyses comparatives se sont avérées efficaces pour susciter de tels projets dans d'autres administrations et que les vérifications thermiques semblent des outils utiles dignes de mention, le Programme d'analyse comparative et

de vérification propose d'utiliser les vérifications thermiques subventionnées pour inciter les propriétaires de bâtiments à participer au défi d'analyse comparative et de déclaration des données.

L'expérience de ressorts territoriaux de premier plan a démontré que les programmes d'analyse comparative peuvent améliorer l'efficacité énergétique d'environ trois pour cent par année. Ces programmes favoriseraient en outre la maturation de l'industrie en créant une culture de la sensibilisation aux émissions chez les propriétaires, les locataires et les investisseurs.

Le Programme d'analyse comparative et de vérification serait mené de concert par des membres du personnel actuels et prestataires de services externes qui seront choisis par les voies d'approvisionnement habituelles. Des fonds seront demandés à la Fédération canadienne des municipalités (FCM) afin d'élargir la portée du programme.

Si le Programme d'analyse comparative et de vérification est approuvé, le personnel propose de le lancer au quatrième trimestre de 2021, pour un mandat initial d'une année. Des prolongations au-delà de ce premier mandat sont à prévoir, mais elles dépendront des succès obtenus et des fonds disponibles. Un rapport destiné au Conseil sur les répercussions du programme sera intégré au Compte rendu annuel du Plan directeur sur les changements climatiques.

Répercussions financières

Recommandations 1 et 3 à 6 : Aucune répercussion financière directe.

Recommandation 2 : Les coûts estimés du programme d'analyse comparative et de vérification sont de 298 000 dollars. Les estimations touchent des services d'analyses des sources de chaleur, de vérifications virtuelles, d'analyses de données et de renforcement des capacités. Le financement sera versé dans le cadre d'Évolution énergétique 908880.

Consultation et commentaires du public

Les parties prenantes ont eu l'occasion de fournir leurs commentaires sur la Stratégie et le Programme de trois façons : en examinant des versions provisoires des documents, par des sondages et au cours de réunions de consultation. Deux sondages ont été

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menés, le premier de décembre 2020 à février 2021 et le second en août et septembre 2021.

Le groupe de travail technique sur les bâtiments Évolution énergétique a assisté à une présentation et a été invité à fournir ses commentaires en janvier 2021. La Building Owners and Managers Association a assisté à une présentation et a été invitée à donner son avis en février 2021. Un groupe de travail sur l'amélioration des bâtiments commerciaux a été mis sur pied en juillet 2021 pour donner son avis sur la Stratégie et le plan de mise en œuvre.

BACKGROUND

Council Direction

In April 2019, Council declared a [climate emergency](#) and directed staff to:

- Develop climate change mitigation and adaptation priorities for next five years (2019-2024) to embed climate change considerations across all elements of City.
- Establish a Council Sponsors Group comprised of representatives from the Standing Committee on Environmental Protection, Water and Waste Management, Planning Committee, Transportation Committee, Transit Commission, the Ottawa Board of Health, and the Councilor Liaison of the Environmental Stewardship Advisory Committee business; and
- Work with senior levels of government to accelerate ambition and action to meet the urgency of climate change and provide additional resources for municipalities and the public to reduce their greenhouse gas emissions and build resiliency to climate impacts.

In January 2020, Council approved the Climate Change Master Plan ([ACS2019-PIE-EDP-0053](#)) and set a new target to reduce community greenhouse gas (GHG) emissions 100 per cent by 2050. The Better Buildings Ottawa Strategy helps advance two of the eight priority actions: implementing Energy Evolution and encouraging community action through education, incentives, support, and advocacy to senior levels of government.

The Climate Change Master Plan also provided delegated authority to the Council Sponsors Group on Climate Change to provide the Mayor with a list of priority areas

and activities, which are consistent with the Council-approved Climate Change Master Plan, to allow the Mayor to advocate with the provincial and federal governments on program funding, co-delivery opportunities and related policy and regulatory supports necessary to implement the Climate Change Master Plan priority projects, as appropriate.

In October 2020, Council approved the Energy Evolution Strategy ([ACS2020-PIE-EDP-0036](#)). The Commercial Building Retrofit Accelerator Program (now called the Better Buildings Ottawa Strategy) was one of 20 Energy Evolution projects to meet Ottawa's greenhouse gas reduction targets, so this report is the fulfillment of Council's direction.

Relevant Context

In September 2021, the Federation of Canadian Municipalities is in the final review stage and it is looking likely that they will provide a \$175,000 grant to through their Green Municipal Fund feasibility study grant program.

The International Panel on Climate Change has announced a code red for humanity with regards to the urgency to reduce greenhouse gas emissions to irreversible climate change¹.

In November 2021, Canada will attend the 26th Conference of the Parties (COP) to make commitments regarding climate change mitigation and greenhouse gas reductions. In September, the City announced, with several other large employers, that it has signed the Race to Zero.

As a result of these activities, awareness for the urgency of greenhouse gas reductions is at a high. This context provides an opportune time to launch Better Buildings Ottawa Strategy and Benchmarking and Auditing Program.

DISCUSSION

Rationale

According to the Intergovernmental Panel on Climate Change (IPCC) "rapid, far reaching and unprecedented changes in all aspects of society" are required to avoid

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<https://www.un.org/press/en/2021/sgsm20847.doc.htm#:~:text=Today's%20IPCC%20Working%20Group%201,of%20people%20at%20immediate%20risk.>

catastrophic impacts associated with climate change”². A code red was announced in August 2021 regarding the urgency of rapid emissions reductions³.

The buildings sector is currently the largest contributing sector to greenhouse gas (GHG) emissions in Ottawa and the largest energy consumer. Part 3 buildings alone contributed 22 per cent of Ottawa’s emissions in 2019. As shown in Figure 1, most of these emissions are associated with space heating, therefore effective emissions reduction programs for Ottawa should focus on reducing and electrifying space heating loads in buildings.

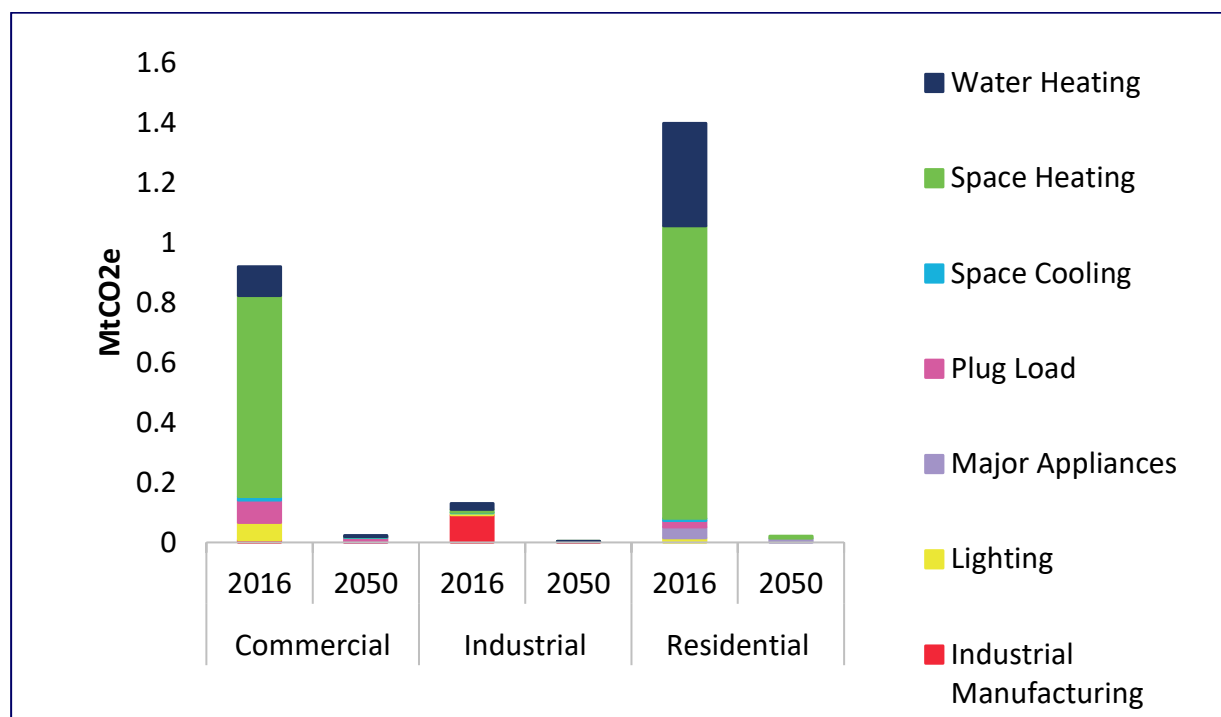


Figure 1 Existing Building GHGs by Fuel and Energy End Use

² IPCC Press Release. Summary for Policymakers of IPCC Special Report on Global Warming of 1.5°C approved by governments. October 8, 2018.
https://www.ipcc.ch/site/assets/uploads/2018/11/pr_181008_P48_spm_en.pdf

³

<https://www.un.org/press/en/2021/sgsm20847.doc.htm#:~:text=Today's%20IPCC%20Working%20Group%20of%20people%20at%20immediate%20risk.>

Integrated emissions modeling done through Energy Evolution shows that the Part 3 building stock must be transformed the following ways over the next 30 years to achieve the necessary GHG reductions:

By 2030:

- Retrofit 27% of all small commercial buildings; achieve thermal savings of 60%; electrical savings of 30%.
- Retrofit 27% of the existing large institutional, commercial, and industrial building stock with average savings of 50% (combined thermal and electrical)
- Conservation efforts precede fuel switching to devices such as heat pumps or zero emission district energy.
- Install 44,322 heat pumps in apartments (72% air/28% ground)
- 38% of ICI floor space is served by heat pumps
- 41% of water heating load served by electric water heaters

By 2040:

- Retrofit 98% of small commercial buildings to achieve thermal savings of 60%; electrical savings of 30%
- Retrofit 95% of the large MURB and ICI building stock with average savings of 50% (combined thermal and electrical)
- Install 82,728 heat pumps in apartments (72% air/28% ground)

By 2050:

- 73% of ICI building heat load served by heat pumps by 2050
- 63% of water heating load served by electric water heaters by 2050.

These targets require a retrofit rate of almost 5% of buildings per year. To date, retrofit rates in Ottawa have been less than 1% per year. Furthermore, some of the retrofit measures required to achieve zero emissions do not have financial returns on

investment. Therefore, significant market transformation will be needed to accelerate this shift.

Financial analysis completed through Energy Evolution identified that \$1.9 billion in incremental investment is needed to achieve these retrofit measures community-wide if a revolving loan fund can be set up to reinvest savings into further reductions. The overall net benefit will be \$3 billion by the end of the life of the assets. Due to the scale of the investments, the ownership structure, and the other competing priorities for municipal investments, it is expected that the vast majority of this capital in retrofits will be private investments. There is, however, a role for municipalities to play in catalyzing these investments and driving down the costs to residents while optimizing GHG reductions from the investments.

Recommendation #1: Approve the Better Buildings Ottawa Strategy attached as Document 1 and summarized in this report

Strategy Overview

The Better Buildings Ottawa Strategy identifies roles for the municipality in achieving the GHG reduction targets from private commercial, institutional, and industrial (ICI) buildings as well as large multi-unit residential buildings (MURBs) in Ottawa, called Part 3 buildings as defined in the Ontario Building Code. It excludes those owned or operated by the City of Ottawa since they are dealt with under a separate Municipal Building Retrofit strategy. This Better Buildings Ottawa Strategy focuses on both reducing heating demand as well as fuel switching to maximize the carbon and financial returns.

This Strategy is based on the theory of market transformation, which involves strategically intervening into a given market to change its overall direction. While market transformations can occur without the direct intervention of governments, the City of Ottawa is faced with a very short timeline to reduce a significant volume of emissions from the building sector.

The approach for the development of this Strategy is to:

- Promote a no-regrets approach by reducing heating and electricity loads first;
- Prioritize a transition to zero-carbon fuel sources;

- Address energy poverty through comprehensive planning; and
- Leverage third-party funds for energy retrofits.

The Strategy proposes five key elements to accelerate the uptake of retrofits:

1. Benchmarking and Disclosure
2. Marketing and Education and Training
3. Coordinating and Supporting Accelerated Retrofits
4. Energy Retrofit Standards and other Regulations
5. Senior Government Engagement

Benchmarking and Disclosure

Benchmarking and public disclosure of building energy and water consumption has proven fundamental in jurisdiction with mature retrofit economies because it sets baselines, diagnoses performance, improves emissions awareness for owners and occupants, provides insights for policy makers, and enables tracking of progress. Experience from leading jurisdictions has shown that benchmarking programs can improve energy efficiency by approximately 3 per cent per year. It has also been found to facilitate a maturation of the industry by creating a culture of awareness of emissions amongst building owners, tenants, and investors.

Marketing and Education and Training

Marketing, education, and training are foundational components to overcome knowledge, capacity, and motivation barriers. Training can help ensure that the quantity and quality of the labour force is not a barrier to success of the Strategy. Providing information and incentives when a renovation is being planned, major equipment is being replaced, or asset management plans are being developed is more likely to result in uptake.

Coordinating and Supporting Accelerated Retrofits

By collaborating and coordinating buildings undergoing retrofits, economies of scale can help secure lower cost equipment and/or financing for all. Municipal financing programs,

such as a Local Improvement Charges or Community Improvement Plans, will explore ways to maximize this potential of amalgamation. For certain measures, incentives will be required to make them financially attractive enough for mass uptake.

Energy Retrofit Standards and other Regulations

Given that uptake of voluntary programs is expected to be insufficient to meet Council's approved GHG reduction, mandatory energy performance will likely be required. Staff will explore options, work within legislative authorities, and follow the effectiveness of what other jurisdictions implement. The three regulations identified are mandating benchmarking and disclosure, energy audits, and emissions performance standards.

Senior Government Engagement

There are several market signals and responsibilities that lie outside of the City's control which could significantly affect the success of the Strategy. By both collaborating with other municipalities and leveraging its position as the capital of Canada, the City can engage with senior levels of government to accelerate our collective level of ambition.

The Strategy takes the approach of first introducing voluntary programs and policies in the near-term (2022-2024), followed by mandatory requirements in the medium (2025-2029) to long-term (2030+). Lessons learned from the implementation of voluntary programs, along with consultations with internal and external stakeholders, will inform the implementation plans for any mandatory requirements.

Recommendation #2: Approve and direct staff to launch the Benchmarking and Auditing Program, attached as Document 2 and summarized in this report

The first Program proposed to implement this Strategy is a Benchmarking and Auditing Program, which aims to address elements 1 and 2 of the Strategy.

Role of Benchmarking and Audits in Retrofits

Experience shows that collecting and reporting on building performance is a foundational step that alone can lead to annualized savings of between 2 and 3 per cent. Studies have also shown that energy-efficient buildings have 10 per cent higher

occupancy rates, 10 per cent higher premiums on rents, and 25 per cent higher sales prices when compared to less efficient buildings⁴.

Benchmarking programs influence the real estate market, enabling energy to be considered in property valuations, which then rewards superior performance. When measures are included in the asset valuation, the financial benefit and risk are reduced, which in turn reduces the need for incentives.

Benchmarking and Auditing in Canada to Date

In Ontario, public sector buildings already are required to publicly disclose their energy consumption. Private buildings with a gross floor area of 100,000 square feet or more are required to report energy and water data on an annual basis through a program called ENERGY STAR® Portfolio Manager®. This requirement will be extended to 50,000 square foot buildings in 2023. Province-wide, the Energy and Water Reporting and Benchmarking (EWRB) regulation applies to 18,000 buildings to date, with 990 in Ottawa. Only aggregate data is disclosed publicly, which reduces the opportunity for awareness, industry maturation, and market transformation.

The percentage of regulated buildings that complied with the regulation was 51 per cent Province-wide and 49 per cent in Ottawa in 2018. This was significantly lower than compliance rate in the City of Toronto, which achieved 78 per cent. The higher City of Toronto compliance rate are the result of a City-implemented education and outreach campaign. It demonstrates the opportunity for increased success with similar efforts, as proposed in this Program.

The cost for a building to comply with the EWRB requirement is estimated at \$300 annually⁶. Experience from other jurisdictions across North America shows that the average building of 50,000 to 100,000 square feet achieves annual savings of between \$1,000 and \$1,500 per building after only one year of benchmarking, paying the cost back 3 to 5 times. A threshold of 20,000 square feet has been selected by Edmonton and Calgary as the threshold whereby buildings are encouraged to voluntarily benchmark and disclose at the address level.

⁴ IMT *Energy Benchmarking and Transparency Benefits* https://www.imt.org/wp-content/uploads/2018/02/IMTBenefitsofBenchmarking_Online_June2015.pdf

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Audits following the American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE) II methodology have been incentivized through utility programs for many years. Many buildings have received these audits in the past ten years. These audits mainly focus on mechanical equipment and electrical use in a building; they rarely provide details on the building envelope upgrade opportunities. Energy Evolution identified that buildings need to improve their envelope as a first step in the retrofit journey to achieve the system wide energy conservation that will be needed to realize the GHG reduction targets. As such, the Program proposes to provide audits that focus on thermal envelope opportunities as an overlooked step in the retrofit journey.

Ottawa's Proposed Benchmarking and Auditing Program Overview

A benchmarking and disclosure program for Part 3 buildings 20,000 square feet and more is recommended for Ottawa; buildings of that size have sufficient energy savings opportunities to offset the cost of benchmarking at this size. It is recommended that a voluntary program be introduced in 2021 and the converted to mandatory in a few years, unless the Province amends its Energy and Water Reporting and Benchmarking program to include smaller buildings, to disclose energy performance at the address level, and to ensure participation.

The Better Buildings Ottawa Benchmarking and Auditing Program is based on lessons learned from similar municipal programs across North America and is leveraging existing platforms, the Canada Green Building's Disclosure Challenge and Natural Resources Canada's Energy Star Portfolio Manager. Canada Green Building Council has built a voluntary, automated mapping of energy benchmarking data through their Disclosure Challenge to provide a visual image of Part 3 buildings and enable comparison between buildings of similar types and uses. The Program proposes to leverage the Disclosure Challenge online tool for ease of comparison between buildings locally and across the Country.

To incent participation in the benchmarking, the Program proposes to offer virtual energy audits for participants and thermal scans for target neighbourhoods. It will also provide thermal audits to five buildings with significant opportunities to improve their building envelope. It will further support building owners through tailored capacity building workshops, peer learning opportunities, case studies and tours.

Federation of Canadian Municipalities' Green Municipal Fund

The Federation of Canadian Municipalities (FCM) is anticipated to award the City of Ottawa a Green Municipal Fund feasibility study grant valued at \$175,000 to support the Better Buildings Ottawa Benchmarking and Auditing Program. Staff are working with FCM, relevant federal departments, and the other municipal practitioners to share learnings and experience to improve the success rates of similar programs across Canada.

Program Delivery

The Program will be delivered by City staff with support from service providers including Canada Green Building Council, the Building Owners and Managers Association, and an energy auditing firm.

Eligibility

Voluntary participation is proposed. It will be owner-initiated and available to any owner of a building greater than 1,850 m² (approximately 20,000ft²) in Ottawa that meets the following eligibility requirements:

- Sign a consent form
- Disclose at least the previous year's energy and water consumption

Budget

The maximum FCM grant contribution to any pilot program is 50 per cent of eligible costs. The City is required to contribute 50 per cent of all program costs through matching contributions.

To fulfill the City's matching requirements, \$122,900 has been committed from the CCR budget (of a total of \$440,000 earmarked for these initiatives) in addition to \$53,398 in existing staff time over the first year of the program.

In-kind contributions from collaborators are expected to be \$30,000.

Pilot Neighbourhoods

Any eligible building in Ottawa will be welcome to participate in the Benchmarking and Auditing Program. Given that office buildings are the most numerous building typology of those eligible for the program and given that Ottawa's two main commercial districts occur in Centretown and Kanata North, these two neighbourhoods have been selected as the priority neighbourhoods for this pilot program. This will also leverage Hydro Ottawa conservation programs which target those neighbourhoods. Street view thermal scanning of these neighbourhoods will be used to identify which buildings can benefit most from thermal improvements and encourage building owners to participate.

Equity and Inclusion - Strategy

As individual policies and programs recommended in the Strategy undergo detailed design, a more thorough equity analysis will be conducted to ensure equity-deserving groups are supported as buildings are transitioned to net zero.

The Strategy recognizes that the considerable costs of the building improvements needed to achieve our ambitious emissions reduction targets are most directly borne by building owners. The main challenge in the residential sector is to prevent or minimize these costs being passed down to tenants, which could exacerbate housing affordability challenges. These affordability challenges are often felt most by Ottawa's equity-deserving groups.

Approximately 34 per cent of Ottawa's residents are renters. There are 104,000 units in apartments in Ottawa, which make up a large part of the city's rental stock. Benefits to social equity can be realized by focusing support programs on social housing, low-income neighbourhoods, and rental apartment buildings that provide foundational housing and need repair and upgrade.

Consideration should also be given to affordability concerns in the commercial buildings sector, where local business owners may face increased costs of building upgrades that will impact their bottom line.

Efforts have been made to analyze and quantify, where possible, the potential co-benefits that can be achieved, identify where potential negative impacts may arise, and provide recommendations for limiting them. With the right approach and involvement of

the right stakeholder groups, the implementation of the Better Buildings Ottawa Strategy can achieve numerous co-benefits and result in improvements to equity

Equity and Inclusion - Program

The process of realizing energy conservation and emissions reductions in buildings can improve quality of life for diverse communities within Ottawa. Indicators include improvements in health, economic prosperity, and socially equity. To ensure that the program supports those who are most vulnerable to energy poverty, the Program will prioritize thermal scans of buildings that demonstrate the most need for building envelope improvements.

Benefits

The following benefits are expected with the launch of a Better Buildings Ottawa Strategy and Program:

- GHG reductions;
- Job creation in the contractor, trades, and renovators' sectors;
- Improved health outcomes from more comfortable, healthier, and more quiet buildings; and
- More resilient building stock to extreme weather events.

Health benefits are most greatly felt in multi-unit residential buildings (MURB), as better insulated and airtight walls and windows, improvements to ventilation, and upgraded heating and cooling systems can improve comfort, air quality, and overall living conditions for residents. Improved resilience to more extreme weather events can be achieved with enhanced envelope performance (e.g., homes stay cooler or warmer for longer without energy). Fuel switching to heat pumps can provide active cooling where before there may have been none, and onsite solar PV coupled with battery storage can provide back-up power, all contributing to more resilient buildings.

Envelope upgrades of buildings provides significant local economic activity, including localized job creation. The Benchmarking and Auditing Program is expected to stimulate significant local investments. Retrofits quantified through this program are expected to average \$5.4 million per building based on the Energy Evolution modeling. Typically,

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buildings implement the measures over many years, so if 25 per cent of the measures are implemented over three years in 75 participating buildings, this represents \$101 million in investments.

GHG and Energy Reductions

Given the projected cost per kilotonne of CO₂ emissions in commercial buildings, this represents 79 ktCO₂ emissions reductions per year. In energy terms, that represents 3,334 GJs of savings annually. It is also expected that 10% of participating buildings will add a 100kW solar array on the roof, representing 2700 GJs of additional solar energy per year.

Job Creation

Reducing energy consumption and promoting the use of renewable energy is already credited with the creation of new green jobs in manufacturing, construction, and trades. Retrofitting buildings increases the demand for various low-carbon and renewable energy technologies while also generating a demand for workers who can perform building upgrades, such as adding insulation, installing building automation systems, or replacing mechanical systems. One study estimated that 30 job-years of employment will be created for every \$1M invested in energy efficiency⁵.

The job creation potential associated with renewable energy is equally well established. Canada's clean energy sector is growing faster than the rest of the country's economy (4.8 per cent versus 3.6 per cent annually between 2010 and 2017), while also attracting tens of billions of dollars in investment every year. It's a large and growing employer, accounting for 298,000 jobs in Canada in 2017 which is equal to direct employment in the real estate sector.⁶ Building retrofits have been identified by the federal government as a part of the national economic recovery effort.

The retrofits targeted in the Better Buildings Ottawa Strategy are projected to result in 8,899 person years of employment over the next 20 years, most of which would be local contractors⁷.

⁵ Dunsky Energy Consulting "The Economic Impact of Improved Energy Efficiency in Canada" 2018.

⁶ Clean Energy Canada. (2019). Missing the Bigger Picture: Tracking the Energy Revolution 2019.

Accessed on Nov 18, 2019 from <https://cleanenergycanada.org/report/missing-the-bigger-picture/>

⁷ City of Ottawa. (2020). Energy Evolution Strategy.

This Program is a first step towards realizing that job creation which would also maximize the benefit to building owners from other incentive programs such as utility rebate programs and low-cost financing offered through Canada Infrastructure Bank. The Program is expected to stimulate retrofits resulting in 544 person years of employment during the term and another 1,632 as retrofits are completed.

Better Buildings

Retrofits have the potential to improve health outcomes from more comfortable, healthier, and quieter buildings that are more resilient to power outages⁸. Ottawans are already spending \$2.9 billion on building renovations annually. By steering these renovations towards energy saving, these funds will result in healthier, more valuable, and more efficient buildings. A 2019 Edmonton study found that energy efficiency measures increased the speed and resale value of buildings. High efficiency heating equipment increased the value by 2.4 per cent, insulation by 6.7 per cent, efficient windows by 5.1 per cent, and renewable energy by 2.7 per cent⁹. The price premiums found in this study are within the range of values found in literature more generally.

More Resilient Building Stock to Extreme Weather Events

Although the Better Buildings Ottawa Strategy and Benchmarking and Auditing Program is primarily targeted at reducing energy consumption and improving energy efficiency, it will support the uptake of building adaptation improvements such as insulation, weatherproofing, air conditioning, and permeable surfaces. These measures can make buildings more resilient to such weather impacts as hotter and drier summers and extreme weather events. The City's on-going climate vulnerability and risk assessment will continue to assess ways in which Ottawa's buildings can be made more resilient.

Risks

There are risks to implementing the Better Buildings Ottawa Strategy. These are outlined below:

⁸ Clean Air Partnership "Accelerating Home Energy Efficiency Retrofits Through Local Improvement Charge Programs: A Toolkit for Municipalities" 2020. Accessed on Jun 22, 2020 from <https://www.cleanairpartnership.org/wp-content/uploads/2020/05/FINAL-LIC-TOOLKIT-Accelerating-Home-Energy-Efficiency-Retrofits-Through-LIC-Programs-2020-1.pdf>

⁹ <https://homes.changeformclimate.ca/wp-content/uploads/2019/08/City-of-Edmonton-Hedonic-Price-Analysis-Energy-Efficiency-Final.pdf?5f4561&5f4561>

- Lack of authority for mandatory requirements - mandatory emissions performance targets have not been implemented by Ontario municipalities previously and, although authority appears to be granted under the Municipal Act, implementation of such a regulation may face considerable enforcement hurdles. However, such a requirement is expected to be ultimately necessary to realize the targets. To mitigate this risk, comprehensive consultation with stakeholders is recommended.
- Budget pressure risk for the administration and enforcement of mandatory requirements - mandatory requirements would result in new responsibilities for the City in terms of administration of the requirements and their enforcement. Resourcing and cost implications for the City will be evaluated as part of future reports to Council on mandatory requirements.

There are risks specific to implementing the Benchmarking and Auditing program. These risks and their mitigation measures are detailed below:

- Contractor performance risk – mitigated through careful selection of service providers, requirement for errors and omissions insurance, and the right to inspect documents;
- City liability risk – mitigated through consent forms; and
- Participation uptake risk - mitigated by the grant funds.

Because of the steps proposed to mitigate these risks, staff recommend receiving the Better Buildings Ottawa Strategy, approving the Benchmarking and Auditing Program, and launching the Better Buildings Ottawa Benchmarking and Auditing Program in Q4 2021.

Next Steps

Q4 2021: Program Launch

- Sign delivery contracts and terms with funders
- Implement new City processes, systems, and resources to support the program
- Launch website, marketing, and outreach

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- Recruit participants
- Launch contractor training
- Finalize service agreement(s) with delivery partners

Q1 2022 – Q3 2024: Program Delivery and Strategy Implementation Planning

- Adjustments as necessary to respond to uptake rates and feedback from participants
- Provide annual updates to Council via the CCMP status update reports
- Update report(s) to Council and FCM as needed
- Report back to Council with proposals for further programs and policies to implement the Better Buildings Ottawa Strategy, as per the Recommendations in this Report.

Q4 2024:

- Program Impact Analysis Report
- Final Grant Disbursements
- Report to Council
- Program Extension (if approved by Council)

Recommendation #3: Request the Government of Ontario to:

- a) Amend the province's Reporting of Energy Consumption and Water Use (O.Reg. 506/18) regulation to mandate industrial, commercial, institutional, and multi-unit residential buildings of 1,850 m² (approximately 20,000 ft²) or larger and other building types to report their energy consumption and water use, and to expand the scope of the regulation to include energy, water, and greenhouse gas emissions disclosure at the address level.**

Staff recommend that the Council Sponsor's Group request that the Province expand the EWRB program to smaller buildings, enforce it, and add mandatory disclosure of

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EWRB data at the address level. This would save the City from having to recreate such a program and implement it themselves. It will ultimately ensure that transparent property data is available to the market.

b) Implement a net zero retrofit code.

Staff recommend that the Council Sponsor's Group request that the Province implement a retrofit code in line with pending federal emissions reduction targets. Such a code may also include regular recommissioning requirements, which may prevent the City from needing to implement such requirements (as per recommendation 4).

c) Provide authority for municipalities to mandate energy and emissions performance standards, if necessary.

The need to affect change in the comprehensive manner to meet the City's GHG targets may not be matched by the authorities and resources the City currently has at its disposal. Staff recommend working with other municipalities to galvanize any necessary policy changes at the provincial level. The City of Toronto has approved similar requests to the province so there is an opportunity to align efforts.

d) Create grant and/or rebate programs to improve the business case for deep retrofits with longer paybacks for all building types.

Some retrofit measures will require incentives to make them financially attractive and push them along the market transformation curve. Staff recommend that the Council Sponsor's Group request that the Province offer more rebates and ease access to existing programs.

e) Demonstrate leadership through deep carbon retrofits in provincially owned or leased buildings.

Through the Municipal Renovation and Retrofit Program, the City aims to decarbonize its buildings by 2040 as a demonstration. Staff recommend that the Council Sponsor's Group request that the Province do the same with their buildings to demonstrate leadership and support market transformation.

Recommendation #4: Direct staff to report back to Council on the City's legislative authority and implementation plan to require the following for existing commercial, institutional and multi-unit residential buildings of 1,850 m²

(approximately 20,000 ft²) or larger should the Government of Ontario not amend its Energy Consumption and Water Use regulation:

a) Mandatory annual energy, water, and greenhouse gas emission benchmarking and disclosure

When requirements to benchmark and disclose energy and emissions data are coupled with a requirement to disclose that information to the public at key decision-making points, tenants and future buyers can make a more informed choice when deciding to lease, rent, or purchase a space. Disclosure also helps new owners plan for future retrofits. Experience has shown that displaying energy ratings of efficient buildings generally has a positive impact on property sale prices.

Staff will report back on:

- the necessary authorities and appropriate regulatory channels to implement mandatory benchmarking and disclosure requirements;
- approaches to enforcement of mandatory requirements;
- expected resourcing and cost implications for the City; and
- projected equity and affordability concerns and mitigation strategies for negative impacts.

b) Mandatory energy and emissions audits and/or recommissioning reports, and retrofit plans

Energy audits and recommissioning exercises help to pinpoint specific areas of improvement in building systems and operations and encourage a planned approach to retrofits. They identify inefficient equipment and systems and recommend upgrades or operational improvements to achieve energy savings, reduce emissions, and improve occupant comfort. Resultant actions from energy audits and recommissioning yield an average energy savings of around 5 per cent but much higher is possible if deeper measures are implemented.

The actions identified in energy audits and recommissioning reports can inform asset management plans (capital plans or building condition assessment reports) that identify the timing of building improvements based on lifecycle replacements. Most Part 3

buildings already follow a regular process for asset management planning, however, without a mandatory requirement, these asset management plans will not align with the City's GHG reduction targets. Such a requirement would confirm that building owners are aware of what is required to meet upcoming emissions performance targets and integrate those requirements into capital planning processes so they can be properly anticipated and accounted for.

In the absence of existing equivalent mandatory requirements at other levels of government, by 2025, staff recommend developing an implementation plan for mandatory energy audit or recommissioning requirement. ASHRAE Level II energy audits are the industry standard for capital planning purposes and would be the recommended methodology for these audits. Then, the City should require integration of energy audit and recommissioning recommendations into asset management plans. The requirement could initially apply to large buildings (e.g., >4,6450 m²) and subsequently be rolled-out to smaller buildings.

c) Mandatory emissions or energy performance targets

Establishing emissions performance targets is an increasingly common way of driving deep emissions reductions in buildings. Vancouver, New York City, St Louis, Washington DC, and Washington State have exemplary programs that have successfully transitioned performance targets from voluntary to mandatory compliance to drive the deep retrofits at scale. These jurisdictions use verifiable building energy data to determine actual building emissions performance rather than relying on modelled performance.

Emissions performance targets with set requirements for compliance offer expanded clarity as to the necessary levels of emissions performance for a particular building sector and directly motivate deep retrofit action where voluntary measures do not. Emissions performance targets allow building owners the flexibility to determine the most cost-effective and appropriate means of improving emissions performance in their buildings.

It is important to note that Ottawa may not currently have the authority needed to implement mandatory emissions performance targets and may need to engage with the Government of Ontario to be able to pursue this approach (as per recommendation 6).

Mandatory emissions performance targets for low-income housing should be carefully considered, in particular as it relates to the potential to impose considerable costs on homeowners and renters and negatively impact housing affordability. For these types of buildings, alternative compliance pathways, such as prescriptive retrofit measures instead of strict emissions performance requirements, and affordability mitigation strategies, such as above guidelines rent increase limits, should be investigated thoroughly.

Preliminary emissions performance targets are being modelled for each major building type using the best data and analysis available at this time and will suggest the best starting point for voluntary emissions performance targets. Once established, mandatory emissions performance targets should continue to be reviewed and updated at regular intervals, using the latest available data.

Recommendation #5: Request the Government of Ontario to direct the Ontario Energy Board (OEB) and Independent Electricity System Operator (IESO) to:

- a) Implement rate structure changes that favour electrification and fuel switching away from natural gas.**

Electrical rate structure changes can be adopted to favour electrification and fuel switching away from natural gas. For example, specific rates for heat pump users can be used to improve the business case for fuel switching from natural gas to heat pumps in buildings.

- b) Fund electrical service upgrades that are required for GHG reduction purposes through the rate base.**

The cost to increase an electrical service to accommodate GHG reductions through fuel switching can be cost prohibitive to individual buildings. It is recommended that the electric utilities fund these service entry upgrades in whole or in part by the rate base where they are required for GHG reduction purposes such as for the installation of heat pumps, electric boilers, or electric vehicle chargers.

- c) Develop utility mechanisms to help support and invest in deep emissions retrofits.**

Innovative procurement mechanisms have been used by utilities to enable and accelerate deep emissions retrofits. One such procurement model that has proven successful in the United States is known as the Measured Energy Efficiency Transaction Structure. It is recommended that the IESO and OEB review and implement similar procurement mechanisms to overcome common barriers to deep energy retrofits.

d) Continue retrofit cost reduction measures, such as performance-based rebates for improved energy and emission performance.

The IESO and OEB have offered various rebates and incentives for energy conservation. Expanding these programs is recommended, in particular for technologies that need support to be cost effective and for building owners who face particular barriers to retrofitting as well as for substitution from gas to electricity powered equipment. GHG reductions have been discussed as objectives in recent OEB directives¹⁰; programs should therefore include GHG reductions targets.

Recommendation #6: Direct staff to request the Government of Canada to:

a) Release a retrofit code that align with the targets set in the Paris Agreement.

Staff recommend that the Council Sponsor's Group request that the Federal Government continue its commitment to developing Canada's National Model Building Codes, including benchmarking and labelling, and to providing additional financial support for retrofits.

b) Continue its commitment to carbon pricing via the *Greenhouse Gas Pollution Pricing Act*.

Carbon pricing is a key metric in driving market transformation. The federal government's proposed \$170 per tonne of CO₂e is projected to be significant enough to signal a market shift. Staff recommend that the Council Sponsor's Group express their support for enshrining this proposed carbon tax into legislation and continue to assess

¹⁰ EB-2019-0003, OEB Letter Post-2020 Natural Gas Demand Side Management Framework (December 1, 2020), p. 3

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what price signal is required to accelerate market transformation to meeting the targets of the Paris Agreement.

c) Create/expand grant programs and tax incentives to improve the business case for deep retrofits with long payback periods.

Some retrofit measures will require incentives to make them financially attractive and push them along the market transformation curve. Staff recommend that the Council Sponsor's Group request that the Federal Government offer more rebates and ease access to existing programs.

d) Work with municipalities to ensure rebates and financing for deep emissions retrofits include providing a loan backstop for municipal retrofit financing programs for private buildings.

Because of both their close connections to building owners and their legislative authority to tie repayment obligations to property tax bills, municipalities are uniquely positioned to offer financing for deep retrofits to existing building owners. However, the scale of investment projected to retrofit existing buildings to meet the GHG targets is beyond what municipalities can manage unilaterally. Staff recommend that the Council Sponsor's Group request that the federal government backstop municipal retrofit financing programs to de-risk the programs for municipalities and to help keep interest rates low for building owners.

e) Continue its enhancement of deep retrofit financing in collaboration with municipalities through the Canadian Infrastructure Bank.

The Canada Infrastructure Bank has been set up to provide innovative financing for building retrofits, among other infrastructure needs. Although it is new, it appears to be a unique and valuable service. By working in tandem with municipalities, the Canada Infrastructure Bank could be a valuable source of capital and low interest financing for retrofits. Staff recommend that the Council Sponsor's Group encourage the federal government to continue to expand upon the services provided by the Canada Infrastructure Bank and continue to explore how to collaborate with municipalities to achieve mass uptake of deep retrofits in private buildings.

f) Set standards for low embodied carbon materials including concrete and steel and low global warming potential refrigerants.

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It is well understood that embodied carbon, called scope three emissions under international protocols, can more than overshadow the benefits of GHG emissions reductions made through retrofits if due consideration is not paid. Based on the experience of leaders in this field including the Federal Treasury Board, it has been documented that the majority of scope three emissions in existing buildings are attributed to concrete, steel, and refrigerants used in foam insulation and heat pumps. Setting low embodied carbon standards for these materials is a role that the federal government can play. To date, standards have been introduced for low global warming potential refrigerants under the Montreal Protocol. This is a good first step and should be strengthened. Concrete and steel have low embodied carbon alternatives and a federal standard would help shift the market towards the use of these better alternatives.

g) Support the manufacturing and supply chains to increase availability of low embodied carbon materials for the building industry.

More often than not, low embodied carbon materials are more expensive than their conventional equivalent. The federal government has an opportunity to reduce these costs and to create an industry in the manufacturing and supply of low or negative embodied carbon building materials. Staff recommend that the Council Sponsor's Group encourage the federal government to support manufacturing and supply chains of these products to make them cost competitive with their conventional counterparts.

RURAL IMPLICATIONS

The program will be eligible to owners of buildings greater than 1,850 m² (approximately 20,000ft²) in Ottawa.

CONSULTATION

The Better Buildings Ottawa Strategy was developed with input from city staff, convened as a sub-committee of the Energy Evolution Interdepartmental Working Group. This sub-committee included representatives from BEEM, Legal, Economic Development, Revenue Services, Water, and Planning, Infrastructure and Economic Development.

The Better Buildings Ottawa Benchmarking and Auditing Program is based on lessons learned from similar municipal programs across North America and consultation with

internal and external stakeholders. The program is leveraging existing platforms, the Canada Green Building's Disclosure Challenge and Natural Resources Canada's Energy Star Portfolio Manager.

A Working Group was established to provide detailed input to the Strategy and Program design by practitioners. The Working Group includes the following members:

- Bentall Kennedy
- BGIS
- BOMA Ottawa
- Envari
- Canada Green Building Council
- Hydro Ottawa
- Board of Trade Sustainability Committee
- JL Richards
- Osgoode Properties
- Ottawa Climate Action Fund
- Ottawa Community Housing
- Posterity Group

External stakeholder consultation included meetings and a survey with the Energy Evolution Building Retrofit Sub Committee. Industry consultations were undertaken with the Building Owners and Managers Association Ottawa Chapter, the Heating, Refrigeration and the Air Conditioning Institute of Canada, the North American Insulation Manufacturers Association, the Ottawa Climate Action Fund, Hydro Ottawa, and large property owners.

Public engagement included a survey through Engage Ottawa in August and September 2021, which received 47 responses as summarized in Document 1.

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Respondents showed general support and alignment with the directions of both the Strategy and the Program, which aligns with the recommendations of this Report.

The purpose of engagement was to:

- Gather high level feedback on the proposed Strategy and Program;
- Identify barriers building owners may have in undertaking retrofits;
- Raise awareness of the program and encourage interested building owners to participate; and
- Identify regulatory challenges at senior levels of government.

The engagement targeted:

- Building owners;
- Property managers;
- Building occupants; and
- Service providers.

COMMENTS BY THE WARD COUNCILLORS

This is a city-wide report – not applicable.

LEGAL IMPLICATIONS

There are no legal impediments to Committee and Council's approval of the recommendations of this Report.

RISK MANAGEMENT IMPLICATIONS

There are risks to implementing the Better Buildings Ottawa Strategy. These are outlined below:

- Lack of authority for mandatory requirements - mandatory emissions performance targets may exceed the current authority of the City; however, they will be necessary to realizing the targets. To mitigate this risk, engaging the Government of Ontario in the near-term is recommended.

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- Budget pressure risk for enforcement of mandatory requirements - mandatory requirements would result in new responsibilities and costs for City administrators. Resourcing and cost implications for the City will be evaluated as part of future reports to Council on mandatory requirements.

There are risks specific to implementing the Benchmarking and Auditing program. These risks and their mitigation measures are detailed below:

- Contractor performance risk – mitigated through careful selection of service providers, requirement for errors and omissions insurance, and the right to inspect documents;
- City liability risk – mitigated through consent forms; and
- Participation uptake risk - mitigated by the grant funds.

ASSET MANAGEMENT IMPLICATIONS

There are no asset management implications associated with the recommendations of this report.

FINANCIAL IMPLICATIONS

Recommendations 1 and 3 to 6: There are no direct financial implication.

Recommendation 2: Estimated costs for the Benchmarking and Auditing Program are \$298,000. Estimates are for thermal scans, virtual audits, data analysis and capacity building services. Funds are available within 908880 Energy Evolution.

ACCESSIBILITY IMPACTS

As individual policies and programs recommended in the Strategy undergo detailed design, especially where multi-unit residential buildings are involved, a more thorough consultation and analysis will be conducted with the AAC to ensure tenants with disabilities and other equity-deserving groups are supported as buildings are transitioned to net zero. Benefits to social equity can be realized by focusing support programs on social housing, low-income neighbourhoods, and rental apartment buildings that provide foundational housing and are in need of repair and upgrade.

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Efforts have been made to analyze and quantify, where possible, the potential co-benefits that can be achieved, identify where potential negative impacts may arise, such as the cost being passed onto the tenants, and provide recommendations for limiting them.

Program staff will also ensure training and procurement as required within sections 5, 7 and 14 of the AODA Integrated Accessibility Regulations are met. This will ensure that all contractors working on the program understand the rights of tenants with disabilities and that the project website is compliant with the WCAG 2.0 AA requirements.

With the right approach and involvement of the right stakeholder groups, the implementation of the Better Buildings Ottawa Strategy can achieve numerous co-benefits and result in improvements to equity. The process of realizing energy conservation and emissions reductions in buildings can improve quality of life for residents with disabilities. To ensure that the program supports those who are most vulnerable to energy poverty, the Program will prioritize thermal scans of buildings that demonstrate the most need for building envelope improvements.

ENVIRONMENTAL IMPLICATIONS

The Better Home Loan Program directly contributes to the Environmental Stewardship strategic outcome to grow and protect a healthy, beautiful, and vibrant city that can adapt to change within the City's 2019-2022 Strategic Plan.

CLIMATE IMPLICATIONS

In January 2020, Council unanimously approved the Climate Change Master Plan, which is the overarching framework for how Ottawa will mitigate and adapt to climate change over the coming decades. It set short, mid, and long-term targets to reduce community GHG emissions by 100 per cent by 2050 and corporate emissions by 100 per cent by 2040.

The Climate Change Master Plan is supported by two key strategies:

- **Energy Evolution: Ottawa's Community Energy Transition Strategy:** Received by Council in October 2020, this strategy is the framework for how Ottawa can achieve its GHG reduction targets.

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- **Climate Resiliency Strategy:** Still under development, this strategy will assess how Ottawa is vulnerable to climate change and identify strategies to mitigate the greatest risks.

In 2019, Part 3 buildings accounted for roughly 22 per cent of total emissions in Ottawa, and Energy Evolution identified retrofitting Part 3 buildings as one of the top actions to take to achieving Ottawa's GHG targets. A total of 20 projects were identified through Energy Evolution to accelerate action and investment, one of which is the Better Buildings Ottawa Strategy.

The proposed program is projected to enable GHG emission reductions of 79 ktCO₂ emissions reductions per year during the project term or 3,318 ktCO₂ over the life of those investments. In energy terms, that represents 3,334 GJs of savings annually, or 200,040 GJ over the life of the investments. It is also expected that 10% of participating buildings will add a 100kW solar array on the roof, representing 2,700 GJs of additional solar energy per year or 162,000 GJ over the investment life.

Although the Better Buildings Ottawa Strategy and Program is primarily targeted at reducing energy consumption and improving energy efficiency, it will support the uptake of building adaptation improvements such as insulation, weatherproofing, air conditioning, and permeable surfaces. These measures can make buildings more resilient to such weather impacts as hotter and drier summers and extreme weather events. The City's on-going climate vulnerability and risk assessment will continue to assess ways in which Ottawa's buildings can be made more resilient.

TECHNOLOGY IMPLICATIONS

There are no technology implications as part of this report. Technological solutions may be a factor in the implementation of the proposed program.

TERM OF COUNCIL PRIORITIES

This work aligns with the 2019-2022 Term of Council Priorities, Environmental Stewardship, to grow and protect a healthy, beautiful, and vibrant city that can adapt to change.

SUPPORTING DOCUMENTATION

Document 1 Better Buildings Ottawa Strategy

**STANDING COMMITTEE ON
ENVIRONMENTAL PROTECTION,
WATER AND WASTE MANAGEMENT**

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**COMITÉ PERMANENT DE LA
PROTECTION DE
L'ENVIRONNEMENT, DE L'EAU ET
DE LA GESTION DES DÉCHETS
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Document 2 Better Buildings Ottawa Benchmarking and Auditing Program

DISPOSITION

Planning, Infrastructure and Economic Development will coordinate the Strategy and Program.