

**METRO VANCOUVER HOUSING CORPORATION (MVHC)
BOARD OF DIRECTORS**

REGULAR BOARD MEETING

Friday, January 29, 2021

9:00 A.M.

28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia

[Membership and Votes](#)

A G E N D A¹

A. ADOPTION OF THE AGENDA

1. January 29, 2021 Regular Meeting Agenda

That the MVHC Board adopt the agenda for its regular meeting scheduled for January 29, 2021 as circulated.

B. ADOPTION OF THE MINUTES

1. November 27, 2020 Regular Meeting Minutes

That the MVHC Board adopt the minutes for its regular meeting held November 27, 2020 as circulated.

C. DELEGATIONS

D. INVITED PRESENTATIONS

E. CONSENT AGENDA

Note: Directors may adopt in one motion all recommendations appearing on the Consent Agenda or, prior to the vote, request an item be removed from the Consent Agenda for debate or discussion, voting in opposition to a recommendation, or declaring a conflict of interest with an item.

1. HOUSING COMMITTEE REPORTS

1.1 Metro Vancouver Housing Tenant Relocation Strategy

That the MVHC Board endorse the Metro Vancouver Housing Tenant Relocation Strategy as presented in the report dated January 4, 2021, titled "Metro Vancouver Housing Tenant Relocation Strategy".

¹ Note: Recommendation is shown under each item, where applicable. All Directors vote unless otherwise noted.

1.2 Metro Vancouver Housing – Approach to Integrated Childcare Facilities if Funding Support is Not Available

That the MVHC Board endorse the recommended approach to proceed with integrated childcare facilities as a priority amenity in new developments if external funding support is not available.

1.3 Managing Metro Vancouver Housing Energy and Greenhouse Gas Emissions – 2014 to 2018

That the MVHC Board receive for information the report dated October 14, 2020, titled “Managing Metro Vancouver Housing Energy and Greenhouse Gas Emissions – 2014 to 2018”.

F. ITEMS REMOVED FROM THE CONSENT AGENDA

G. REPORTS NOT INCLUDED IN CONSENT AGENDA

H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN

I. OTHER BUSINESS

J. BUSINESS ARISING FROM DELEGATIONS

K. RESOLUTION TO CLOSE MEETING

Note: The Board must state by resolution the basis under section 90 of the Community Charter on which the meeting is being closed. If a member wishes to add an item, the basis must be included below.

That the MVHC Board close its regular meeting scheduled for January 29, 2021 pursuant to the *Community Charter* provisions, Section 90 (1) (e) and (k) as follows:

“90 (1) A part of a board meeting may be closed to the public if the subject matter being considered relates to or is one or more of the following:

- (e) the acquisition, disposition or expropriation of land or improvements, if the board or committee considers that disclosure could reasonably be expected to harm the interests of the regional district; and
- (k) negotiations and related discussions respecting the proposed provision of a regional district service that are at their preliminary stages and that, in the view of the board or committee, could reasonably be expected to harm the interests of the regional district if they were held in public.”

L. RISE AND REPORT (Items Released from Closed Meeting)

M. ADJOURNMENT/CONCLUSION

That the MVHC Board adjourn/conclude its regular meeting of January 29, 2021.

**METRO VANCOUVER HOUSING CORPORATION
BOARD OF DIRECTORS**

Minutes of the Regular Meeting of the Metro Vancouver Housing Corporation (MVHC) Board of Directors held at 10:24 a.m. on Friday, November 27, 2020 in the 28th Floor Boardroom, 4730 Kingsway, Burnaby, British Columbia.

MEMBERS PRESENT:

Burnaby, Chair, Director Sav Dhaliwal
 North Vancouver City, Vice Chair Director
 Linda Buchanan*
 Anmore, Director John McEwen
 Belcarra, Director Carolina Clark
 Bowen Island, Director David Hocking*
 Burnaby, Director Pietro Calendino*
 Burnaby, Director Mike Hurley*
 Coquitlam, Director Craig Hodge*
 Coquitlam, Director Richard Stewart*
 Delta, Director George Harvie*
 Delta, Director Bruce McDonald*
 Electoral Area A, Director Jen McCutcheon*
 Langley City, Director Gayle Martin*
 Langley Township, Director Jack Froese*
 Langley Township, Director Kim Richter*
 Lions Bay, Director Ron McLaughlin
 Maple Ridge, Director Mike Morden*
 New Westminster, Director Jonathan Coté*
 North Vancouver District, Director Lisa Muri*
 Pitt Meadows, Director Bill Dingwall*

Port Coquitlam, Director Brad West*
 Port Moody, Director Rob Vagramov*
 Richmond, Director Malcolm Brodie*
 Richmond, Director Harold Steves*
 Surrey, Director Linda Annis*
 Surrey, Director Doug Elford*
 Surrey, Director Laurie Guerra*
 Surrey, Director Doug McCallum*
 Surrey, Director Mandeep Nagra*
 Surrey, Director Allison Patton*
 Tsawwassen, Director Ken Baird*
 Vancouver, Director Christine Boyle*
 Vancouver, Director Adriane Carr*
 Vancouver, Director Melissa De Genova*
 Vancouver, Director Lisa Dominato*
 Vancouver, Director Colleen Hardwick*
 Vancouver, Director Kennedy Stewart*
 Vancouver, Director Michael Wiebe*
 West Vancouver, Director Mary-Ann Booth*
 White Rock, Director Darryl Walker*

MEMBERS ABSENT:

None

STAFF PRESENT:

Jerry W. Dobrovoly, Chief Administrative Officer
 Lauren Cichon, Legislative Services Coordinator, Board and Information Services
 Chris Plagnol, Corporate Officer

*denotes electronic meeting participation as authorized by Section 3.6.2 of the *Procedure Bylaw*

A. ADOPTION OF THE AGENDA

1. November 27, 2020 Regular Meeting Agenda

It was MOVED and SECONDED

That the MVHC Board adopt the agenda for its regular meeting scheduled for November 27, 2020 as circulated.

CARRIED

B. ADOPTION OF THE MINUTES

1. October 30, 2020 Regular Meeting Minutes

It was MOVED and SECONDED

That the MVHC Board adopt the minutes for its regular meeting held October 30, 2020 as circulated.

CARRIED

C. DELEGATIONS

No items presented.

D. INVITED PRESENTATIONS

No items presented.

E. CONSENT AGENDA

It was MOVED and SECONDED

At the request of Directors, the following item was removed from the Consent Agenda for consideration under Section F. Items Removed from the Consent Agenda:

1.1 2020 Budget - Status of Reserves

CARRIED

F. ITEMS REMOVED FROM THE CONSENT AGENDA

1.1 2020 Budget - Status of Reserves

Report dated October 27, 2020, from Joe Sass, Director, Financial Planning and Operations, Financial Services, seeking MVHC Board approval additional reserve applications and transfers to those previously approved by the Board in November 1, 2019 and projecting the reserve balances of operating, discretionary and statutory reserves for 2020.

Main Motion

It was MOVED and SECONDED

That the MVHC Board approve the application and transfer of reserves related to the expenditures and provisions as set out in Schedule 1 of the report dated October 27, 2020 titled "2020 Budget - Status of Reserves".

A member requested this matter be postponed to the next board meeting so that staff can provide a presentation with background information on the reserves.

Deferral Motion

It was MOVED and SECONDED

That the MVRD Board defer consideration of the aforementioned motion to the next regular board meeting and request staff to provide a presentation with background information on the reserves at that same meeting.

DEFEATED

Question on the Main Motion

Question was then called on the Main Motion and it was

CARRIED

Director Richter voted in the negative.

- G. REPORTS NOT INCLUDED IN CONSENT AGENDA**
No items presented.
- H. MOTIONS FOR WHICH NOTICE HAS BEEN GIVEN**
No items presented.
- I. OTHER BUSINESS**
No items presented.
- J. BUSINESS ARISING FROM DELEGATIONS**
No items presented.
- K. RESOLUTION TO CLOSE MEETING**
No items presented.
- L. RISE AND REPORT (Items Released from Closed Meeting)**
No items presented.
- M. ADJOURNMENT/CONCLUSION**

It was MOVED and SECONDED

That the MVHC Board conclude its regular meeting of November 27, 2020.

CARRIED

(Time: 10:28 a.m.)

CERTIFIED CORRECT

Chris Plagnol, Corporate Officer

Sav Dhaliwal, Chair

To: Housing Committee

From: Jessica Hayes, Senior Planner, Regional Planning and Housing Services

Date: January 4, 2021 Meeting Date: January 13, 2021

Subject: **Metro Vancouver Housing Tenant Relocation Strategy**

RECOMMENDATION

That the MVHC Board endorse the Metro Vancouver Housing Tenant Relocation Strategy as presented in the report dated January 4, 2021, titled “Metro Vancouver Housing Tenant Relocation Strategy”.

EXECUTIVE SUMMARY

The *Metro Vancouver Housing 10-Year Plan* seeks to expand Metro Vancouver Housing’s (MVH) portfolio of affordable rental units through the strategic redevelopment of its existing housing sites. MVH aims to make a meaningful contribution to the region’s housing crisis through the provision of new affordable housing units while minimizing the impacts of relocation on existing tenants. The proposed Tenant Relocation Strategy includes the following provisions:

- detailed Tenant Relocation Plans for each project;
- one-on-one support for tenant households, including a minimum of three relocation offers;
- moving costs and compensation that meets or exceeds the requirements of municipal policies and the provincial *Residential Tenancy Act*;
- Right of First Refusal to a suitable replacement unit in the new building; and,
- below-market rents in interim and replacement housing units.

This report summarizes the proposed Tenant Relocation Strategy, and outlines MVH’s commitment to supporting tenants and meeting and exceeding the requirements of provincial legislation and local government policies.

PURPOSE

To seek Housing Committee and MVHC Board endorsement of the Metro Vancouver Housing Tenant Relocation Strategy.

BACKGROUND

In November 2019, the MVHC Board adopted the *Metro Vancouver Housing 10-Year Plan*, which provides a vision and framework to guide how MVH will provide, preserve, and expand its portfolio of affordable housing over the next decade. The plan recognizes the opportunity and need to increase Metro Vancouver Housing’s portfolio of affordable rental housing through the redevelopment of existing housing sites.

Tenant relocation is a critical component of the redevelopment process, and an increasing area of focus for MVH as it moves forward with various redevelopment projects. Currently, MVH does not

have an overarching strategy to guide its approach to tenant relocation and assistance, beyond what is required by the provincial *Residential Tenancy Act* (RTA) and municipal requirements, in instances where the local government has adopted a tenant relocation policy. A strategy to guide MVH's approach to tenant relocation will supplement the provisions outlined in the RTA and provide clear and consistent guidelines for tenant relocation and assistance where municipal policies are not in place.

LEGISLATIVE AND POLICY CONTEXT

The provincial *Residential Tenancy Act* (RTA) outlines the rights and responsibilities of tenants and landlords in British Columbia. The RTA outlines the minimum requirements that landlords must meet when tenants are required to relocate as a result of demolition, renovation, repair, or conversion of a rental unit. Section 49(6) of the RTA states that a landlord can give a tenant four months' notice to end a tenancy if they plan to undertake major construction or renovation that requires the unit to be empty.

The RTA requires that:

- A tenant who receives a notice to end a tenancy under Section 49(6) is entitled to receive from the landlord compensation that is the equivalent of one month's rent payable under the tenancy agreement; and,
- A tenant who receives a notice under section 49(6) is entitled to the right of first refusal to enter into a new tenancy agreement in the new or repaired rental unit.

To date, 12 Metro Vancouver jurisdictions have adopted municipal tenant relocation policies. Increasingly, local governments are recognizing that tenant relocation for non-profit/non-market housing requires a different approach than in market rental housing, and that the levels of compensation required in tenant relocation policies targeted at private market rental developers may pose a challenge to the viability and level of affordability of non-profit/non-market housing projects. For this reason, some municipalities have developed separate requirements for non-profit/non-market housing providers, or have exempted them from their tenant relocation policies.

The supports outlined as part of the Metro Vancouver Housing Tenant Relocation Strategy are not intended to replace requirements set out in the RTA or municipal policies, rather, they are intended to supplement the provisions outlined in the RTA, complement municipal tenant relocation policies, and provide a clear and consistent approach where municipal policies do not exist, or do not apply to MVH projects.

This Strategy is intended as a framework for MVH's approach to tenant relocation assistance and support; more detailed Tenant Relocation Plans will be created on a project-by-project basis, in accordance with applicable local government policies.

ELEMENTS OF PROPOSED STRATEGY

Staff have conducted a scan of non-profit and municipal tenant relocation policies to inform the development of the proposed Tenant Relocation Strategy, to ensure that MVH’s approach is aligned with municipal best practice and industry standards for the non-profit housing sector.

In addition, staff contracted the services of Shawnessy Luke Consulting, an external consultant specializing in non-profit tenant relocation services to advise and provide comment an earlier version of the Strategy. A legal review of the Strategy was also undertaken.

Table 1 summarizes each section of the proposed Metro Vancouver Housing Tenant Relocation Strategy, including the details of each category of tenant assistance, and the rationale for the provisions of the Strategy.

Table 1: Summary of Key Elements of the Metro Vancouver Housing Tenant Relocation Strategy

Section	Detail	Rationale
Tenant Relocation Plans	<ul style="list-style-type: none"> • Project-specific Tenant Relocation Plans outlining compensation and support based on municipal requirements and/or the MVH Tenant Relocation Strategy. • Tenant-facing Tenant Relocation Packages to communicate specific information regarding the relocation process and compensation/assistance available. 	<p>Given that MVH may be subject to municipal tenant relocation policies, project-specific Tenant Relocation Plans will allow MVH to follow the principles of its overarching Tenant Relocation Strategy, while also aligning with respective jurisdictions’ expectations and requirements.</p> <p>Clear communications about the process, including compensation and support, will be provided to all affected tenants via individualized Tenant Relocation Packages.</p>
Relocation Coordination	<ul style="list-style-type: none"> • One-on-one tenant meetings to determine housing needs. • Support for vulnerable tenants. • A minimum of three relocation offers, or in accordance with municipal tenant relocation policies. • Relocation support provided to tenants moving within and outside of the MVH portfolio. • Flexibility in terms of notice to end tenancy from tenants who are required to relocate (e.g. less than 30 days’ notice). 	<p>MVH will meet early with each household to find out about their specific needs and strive to meet tenants’ preferences to minimize the disruption of relocation (i.e., considering access to schools, transit, places of employment, health requirements, and other community connections).</p> <p>Vulnerable tenants, such as seniors, people with disabilities, or mental health issues may require additional and specific housing and supports.</p> <p>Municipal tenant relocation policies often stipulate a number of housing offers that must be presented to tenants. MVH will</p>

		<p>provide a minimum of three housing offers for relocation, and ensure that each tenant can receive the level of support required to find housing that meets their needs.</p>
<p>Moving Costs and Compensation</p>	<ul style="list-style-type: none"> • Moving costs in accordance with municipal tenant relocation policies, or reasonable costs for moving and utilities reconnection on a flat rate basis if an amount is not specified by the municipality. • Moving expenses for tenants moving within and outside of MVH portfolio, and when returning to a replacement unit in the new building (based on existing unit size). • One-month free rent compensation for all affected tenants (whether or not required by the RTA as per Four Month Notice to End Tenancy). • Transfer of security and/or pet deposits (including interest) to new MVH tenancy agreement upon request. 	<p>MVH will provide financial support for moving costs as outlined in municipal tenant relocation policies. Where no municipal policy exists, or moving costs are not specified, MVH will provide a flat rate amount (approximately 15% above prevailing industry rates) to each household to cover both moving and utilities reconnection.</p> <p>All affected tenants will also receive one-month free rent compensation. This compensation is already required by the RTA when tenants are issued a Four Month Notice to End Tenancy, however, MVH will provide the same compensation as an early relocation bonus to any tenant household that finds suitable alternative housing prior to receiving the Four Month Notice to End Tenancy.</p> <p>Legally, tenants are not required to move out prior to the issuance of a Four Month Notice to End Tenancy, but one of the benefits to residents relocating earlier or prior to the notice period is to spread out the quantity of residents relocating at one time (so as not to overwhelm MVH vacancies and/or the private rental market). Providing the one-month free rent to those who elect to move out early removes any possible disincentive for early move-out, and ensures that there is sufficient time to successfully relocate all tenants.</p> <p>MVH is also willing to transfer pet and/or security deposits to new MVH tenancy agreements, to minimize the financial impact on existing tenants.</p>

<p>Affordability</p>	<ul style="list-style-type: none"> • Interim housing for Rent-Geared-to-Income (RGI) tenants will not change (unless their income changes). • Interim housing for Low-End-of-Market (LEM) tenants are set based on the applicable unit and building (generally 10 to 20% below true market rental rates for comparable buildings (e.g., similar area, building age and amenities). • Rents for replacement units in new buildings set at below-market rates on a project-by-project basis. 	<p>Though some municipal tenant relocation policies require that interim and/or replacement rents be set at the tenant household’s existing rental rate, keeping LEM rents at existing rental rates for new buildings can have a significant impact on the financial viability of redevelopment projects.</p> <p>Given that MVH already sets rents based on income (for RGI tenants) and at below-market rates (for LEM tenants), MVH will make every effort to find interim housing options that are suitable and affordable for tenant household’s needs.</p> <p>Rents in replacement units will be set at below-market rates, and support MVH’s mandate to provide safe and affordable rental homes. This will help to maintain affordability for tenants while supporting financially viable redevelopment.</p>
<p>Right of First Refusal</p>	<ul style="list-style-type: none"> • Every reasonable effort to provide tenant households with the Right of First Refusal for a suitable replacement unit in the new building. • Right of First Refusal offered to all eligible tenants, regardless of whether they chose interim housing with MVH or elsewhere. • Tenants can elect to remain in their interim housing unit on a permanent basis if preferred. 	<p>MVH will aim to provide a unit mix in redevelopments that can accommodate all existing tenant households in addition to new tenants. Tenants will be contacted closer to occupancy of the new building, to determine if they would like to return, or remain in their interim housing unit.</p>
<p>Communication and Engagement</p>	<ul style="list-style-type: none"> • Early notice of intent to undertake redevelopment or major renovation requiring tenants to vacate, and ongoing communication throughout the process. • Notice of opportunities to engage on the new building design, including notification in writing. • Documentation and reporting processes. 	<p>MVH will provide early and ongoing tenant communication, including notifying tenants of the intent to redevelop or renovate the property (notices to end tenancies are not issued at this early stage).</p> <p>In addition, MVH will hold meetings with existing tenants as early in the development application process as possible, and explore opportunities to gather tenant ideas and feedback about the new building design.</p>

ALTERNATIVES

1. That the MVHC Board endorse the Metro Vancouver Housing Tenant Relocation Strategy as presented in Attachment 1 of the report dated January 4, 2021, titled “Metro Vancouver Housing Tenant Relocation Strategy”.
2. That the MVHC Board direct staff to amend the Metro Vancouver Housing Tenant Relocation Strategy as discussed by the Housing Committee at the January 13, 2021 Housing Committee meeting, assess any financial implications, and report back to the Housing Committee.
3. That the Housing Committee receive for information the report dated January 4, 2021, titled “Metro Vancouver Housing Tenant Relocation Strategy” and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

If Alternative 1 is approved, financial implications will vary for each redevelopment or major renovation project, depending on the number of tenants that are required to relocate, and any applicable municipal requirements. Costs relating to moving expenses and other compensation will be included in each project budget.

\$3,000 was allocated for external consultant review of the Tenant Relocation Strategy in the Board-approved 2020 Housing Planning and Policy budget.

CONCLUSION

This report outlines the support that MVH will provide to tenants who are required to relocate as a result of redevelopment or major renovation of its housing sites. Relocation assistance for tenants impacted by redevelopment or renovation is a critical component of these projects, for which no current framework exists. Staff recommend Alternative 1.

Attachment (42436914)

Metro Vancouver Housing Tenant Relocation Strategy

Reference

[Metro Vancouver Housing 10-Year Plan Metro Vancouver Housing 10-Year Plan](#)

42759538

Metro Vancouver Housing Tenant Relocation Strategy

The [Metro Vancouver Housing 10-Year Plan](#) (2019) provides a vision and framework to guide how Metro Vancouver Housing will **provide**, **preserve**, and **expand** its portfolio of affordable housing over the next decade. As one of the largest non-market housing providers in the region, Metro Vancouver Housing recognizes the opportunity and need to increase its portfolio of affordable rental housing across the region. One way to do this is through redevelopment of existing housing sites.

While no one wants to move, sometimes it is necessary to relocate tenants for redevelopment or major building renovation that requires units to be vacant. Metro Vancouver Housing will work closely with tenants and member jurisdictions to ensure that our tenants are fully supported in the event they need to relocate.

The Residential Tenancy Act (RTA) regulates all tenancy agreements in residential rental units in British Columbia, and sets minimum requirements that landlords must adhere to when ending a tenancy due to redevelopment or major building renovation that requires units to be vacant.

In addition to RTA requirements, many local governments have also adopted Tenant Relocation Policies, that sometimes involve different requirements for non-market housing providers.

The supports outlined in this strategy do not replace requirements set out in the RTA or municipal policies. They are intended to supplement the provisions outlined in the RTA, complement municipal Tenant Relocation Policies, and provide a clear and consistent approach where municipal policies do not exist.

GUIDING PRINCIPLES

- **Provide secure and equitable rehousing options** – Metro Vancouver Housing will provide secure rehousing options that are equitable and appropriate, based on individual housing needs.
- **Limit disruption and preserve community connections** – Metro Vancouver Housing will seek to minimize the disruption of relocation, and strive to meet tenants' preferences, considering access to schools, transit, places of employment, health requirements, and other community connections.
- **Provide coordination and support** – Metro Vancouver Housing will support tenants every step of the way with one-on-one coordination and support.
- **Maintain affordability** – Metro Vancouver Housing will seek to secure alternative housing that is affordable to tenants, based on their household income.
- **Ensure open and ongoing communication** – Metro Vancouver Housing will provide early notice of the intent to redevelop or renovate, and will ensure tenants are well informed with open and ongoing communication that is accessible for all tenants.

STRATEGIES

The following strategies provide a framework for Metro Vancouver Housing's approach to tenant relocation assistance and support where relocation is required as a result of redevelopment or major renovation that requires units to be vacant. Metro Vancouver Housing will work in cooperation with municipalities who have adopted tenant relocation policies or guidelines and will develop project-specific Tenant Relocation Plans in accordance with applicable local government policies.

1. Tenant Relocation Plans

- a) For each project requiring relocation, Metro Vancouver Housing will prepare a detailed Tenant Relocation Plan, clearly outlining specific information regarding the compensation and support that will be provided to each tenant household, in accordance with any municipal Tenant Relocation Policy and the Metro Vancouver Housing Tenant Relocation Strategy, as applicable.
- b) A Tenant Relocation Package will be created and provided to tenants once a formal project submission has been made to the applicable local government. The Tenant Relocation Package will include clear information outlining the process and timing for relocation, specific compensation and assistance that Metro Vancouver Housing will offer, and additional information about tenants' rights under the *Residential Tenancy Act*, municipal policies, and Metro Vancouver Housing policies.

2. Relocation Coordination and Support

- a) Metro Vancouver Housing will facilitate one-on-one meetings with each tenant household and will ensure that tenants are assisted throughout the process in a respectful, equitable, and effective manner.
 - i. Tenant households will be consulted regarding their moving requirements and preferences well in advance of relocation.
 - ii. Metro Vancouver Housing will consider the needs of vulnerable tenants (e.g. for seniors, people with disabilities or mental health issues) and will work with tenants to identify specific housing and support needs.
- b) Tenant households will be provided with a minimum of three offers for relocation; every reasonable effort will be made to match available units with household needs and preferences.
 - i. Offers of housing will be based on household composition.
 - ii. Offers of housing will reasonably accommodate medical requirements.
 - iii. Each tenant household will be provided with offers for relocation within Metro Vancouver Housing's portfolio based on availability and suitability, provided that they continue to meet Metro Vancouver Housing's Income and Asset Limits, as set out in the [Tenant Selection Policy](#). Tenants will have the opportunity to view these offers and confirm rental rates before making their relocation decision.
 - iv. Tenants who exceed Metro Vancouver Housing's Income and Asset Limits for Low-End-of-Market will be provided with information on three suitable housing options in the private rental market.

- c) Metro Vancouver Housing will support relocations within and outside of its own housing portfolio.
 - i. Metro Vancouver Housing will provide information on other non-profit housing options in the area that may meet the needs and preferences of tenants, as available.
 - ii. Metro Vancouver Housing will work with other non-profit housing providers to secure appropriate housing for tenants, where applicable.
 - iii. Metro Vancouver Housing will support eligible tenants who are not currently Rent-Geared-to-Income to register on the Housing Registry (administered by BC Housing).
 - iv. For tenants relocating outside Metro Vancouver Housing’s portfolio, Metro Vancouver Housing will provide landlord references.
- d) Once a redevelopment or major renovation project has been formally submitted to the applicable local government, Metro Vancouver Housing will offer flexibility in terms of standard notice to end tenancy from tenants required to relocate (i.e., will accept less than one month’s notice to end tenancy).

3. Moving Expenses and Compensation

- a) Once a redevelopment or major renovation project application has been formally submitted to the applicable local government, Metro Vancouver Housing will provide moving expenses to each tenant household (based on existing unit size) to cover reasonable costs for moving and utilities reconnection (e.g. hydro, telephone, internet) on a flat rate basis.
 - i. This compensation will apply to tenants who relocate within or outside of the Metro Vancouver Housing portfolio.
 - ii. Tenant households returning to a replacement unit in the new building will be provided the same moving assistance (based on existing unit size) upon their return.
- b) Once a redevelopment or major renovation project has been formally submitted to the applicable local government, Metro Vancouver Housing will offer compensation to all tenant households in line with what is required by the *Residential Tenancy Act*. Compensation will be allocated to tenant households following a move-out inspection.
 - i. The equivalent of one-month rent as compensation is required by the *Residential Tenancy Act* if tenancies are being ended with a Four Month Notice to End Tenancy for Demolition, Repair, or Conversion of Rental Unit.
 - ii. An early relocation bonus in the form of one-month rent will also be provided to tenant households who relocate before a Four Month Notice to End Tenancy for Demolition, Repair, or Conversion of Rental Unit is required.
- c) Tenant households in good standing may transfer security and/or pet deposits (including any interest accrued) to a new tenancy agreement when moving into interim units within the Metro Vancouver Housing portfolio and/or a replacement unit in the new building.

4. Affordability

- a) Metro Vancouver Housing will make every reasonable effort to ensure that affordability is maintained for existing tenants. In order to do so, tenants will need to provide information regarding income and household composition to enable Metro Vancouver Housing to provide offers for housing that best meets household needs.

- b) Existing Low-End-of-Market (LEM) tenant households that continue to meet Metro Vancouver Housing's Income and Asset Limits, as set out in the [Tenant Selection Policy](#), will be required to pay the rents that are applicable in their selected interim housing unit.
- c) Existing Rent-Geared-to-Income (RGI) tenant households that continue to meet Metro Vancouver Housing's Income and Asset Limits, as set out in the [Tenant Selection Policy](#), will be offered interim housing units within Metro Vancouver Housing's portfolio based on their gross annual household income.
- d) Rents for replacement units in new buildings will be set at below-market rates as determined by Metro Vancouver Housing on a project-by-project basis.

5. Right of First Refusal

- a) Metro Vancouver Housing will make every reasonable effort to provide tenant households with a Right of First Refusal for a suitable replacement unit in the new building, provided that they do not exceed Metro Vancouver Housing's Income and Asset Limits for Low-End-of-Market and remain eligible for Metro Vancouver Housing.
 - i. Offers for replacement units in the new building will be based on household composition.
 - ii. Tenant households who are required to relocate due to redevelopment will be offered the Right of First Refusal whether they choose interim housing within or outside of Metro Vancouver Housing's portfolio. Tenant households who secure interim housing outside of Metro Vancouver Housing's portfolio must ensure that up-to-date contact information is provided in order to receive the offer for Right of First Refusal.
- b) Tenant households who choose interim housing within Metro Vancouver Housing's portfolio can elect to remain in their interim housing unit instead if preferred.

6. Communication and Engagement

- a) Tenant households will be provided with notice of a redevelopment or major renovation project at the earliest opportunity (e.g. during the pre-application stage of a redevelopment project), and will receive ongoing communication regarding the redevelopment/renovation and tenant relocation process (e.g. via regular correspondence, in-person or virtual group and one-on-one meetings).
- b) Metro Vancouver Housing will meet one-on-one with tenant households to identify their housing needs and preferences, and will provide each tenant household with a Tenant Relocation Package outlining the compensation and support each household will receive, along with additional information and resources relevant to the relocation process.
- c) Tenants will have opportunities to share ideas and feedback on the design of new buildings (e.g. municipal consultation processes, tenant meetings, or surveys). Metro Vancouver Housing will provide tenant households with notice of these opportunities in writing.
- d) Metro Vancouver Housing will document tenant relocation processes, offers of housing, and compensation for reporting purposes.

To: Housing Committee

From: Laurel Cowan, Program Manager, Housing Planning and Policy, Regional Planning and Housing Services

Date: December 10, 2020 Meeting Date: January 13, 2021

Subject: **Metro Vancouver Housing – Approach to Integrated Childcare Facilities if Funding Support is Not Available**

RECOMMENDATION

That the MVHC Board endorse the recommended approach to proceed with integrated childcare facilities as a priority amenity in new developments if external funding support is not available.

EXECUTIVE SUMMARY

In 2020, staff was requested to explore opportunities to integrate childcare facilities in new Metro Vancouver Housing (MVH) developments, and to seek funding from the Childcare BC New Spaces Fund. MVH has identified opportunities for childcare facilities or in-home day-care units in five of its upcoming priority developments, and has applied for provincial funding support.

As a competitive program, childcare funding is not guaranteed. Given the cost of construction escalation, MVH is striving to keep projects moving ahead, and must confirm whether it will proceed with the childcare facilities with or without funding support. This report explores the capital and long-term financial implications of the proposed childcare facilities and finds the impacts are quite minimal. If MVH receives funding from the New Child Care Spaces Fund, this will lessen MVH's equity contributions, rather than covering essential capital costs to build the facilities. Staff recommend that MVH proceed with childcare facilities and in-home day-care units in its upcoming priority developments.

PURPOSE

To seek Housing Committee and MVHC Board endorsement of the recommendation to proceed with integrated childcare facilities or in-home daycare units proposed for new development projects, with or without external funding support.

BACKGROUND

Early in 2020, the Housing Committee requested that staff explore considerations for integrating child care facilities in new MVH developments, and to explore the possibility of seeking funding from the Childcare BC New Spaces Fund to cover the cost of integrated child care facilities. The *Metro Vancouver Housing 10-Year Plan*, also emphasizes the need for supporting family-oriented housing through the design of new buildings and provision of on-site amenities, such as integrated daycare.

In September, 2020, staff provided a report outlining considerations for integrating childcare into new MVH developments, including considerations for the types of childcare and efficiencies for group sizes and facilities, site context, integration with residential units, placement within the building, facility design, accessibility, and play areas. This report also suggests that childcare facilities should be leased to third-

party operators, as MVH’s mandate is solely focused on housing, and that facilities should generally be cost neutral to build and operate.

MVH identified opportunities for integrated childcare facilities in three of its new development projects and in-home day-care units in another two developments. To support the proposed childcare facilities in new developments, MVH (or in one case, the municipality), submitted funding applications to the New Child Care Spaces BC fund in November of 2020. This provincial fund can help support up to 100% of the capital costs, and help to outfit the space (e.g., furniture, storage, play equipment) so that it meets licensing requirements and is ready for operations. Funding decisions will be announced in February 2021.

Given the urgent need and the cost of construction escalation, MVH is seeking to keep development projects moving ahead. This will also support projects to be ready to respond to future funding calls and opportunities. However, this requires confirmation that MVH will proceed with the childcare facilities with or without external funding support. As the social benefits of affordable childcare associated with affordable family housing are quite clear, this report explores the financial implications of integrating childcare facilities in new MVH developments, including opportunity costs of space that would otherwise be used for residential units.

PROPOSED CHILDCARE FACILITIES

MVH has explored opportunities for childcare in the five of its new and redevelopment projects:

- New development (municipal land)
 - 119B Ave, Pitt Meadows – 7,700 sf space with 150 childcare spaces
 - 7388 Southwynde Ave, Burnaby – 3,700 sf space with 37 childcare spaces
 - 123 E 23rd St, North Vancouver – 6,000 sf space with 61-81 childcare spaces
- Redevelopment
 - Eastburn Square, Burnaby – in-home daycare unit with 8 childcare spaces
 - Heather Place B, Vancouver – in-home daycare unit with 8 childcare spaces

IMPLICATIONS

Capital Costs and Difference in Total Number of Units

Table 1 outlines differences in the capital costs and number of units that can be provided in each project with and without the childcare element. Capital costs represent the total construction costs, with or without funding support. As indicated, the additional capital cost and impact on the number of residential units is minimal, and varies by project depending on the building design and unit mix.

In cases where the addition of the childcare facility slightly reduces the number of units, there will be an opportunity cost of losing potential residential units. One consideration is that there will be fewer affordable homes provided; however, the childcare facility will also provide a much needed affordable community service. Staff analyzed the long-term financial impact of having fewer units and found the opportunity costs were also minimal. Revenue generated from the additional units would allow for a larger mortgage to be applied for with the monthly rents used to repay the monthly mortgage repayments for the life of the building. When additional appliance replacements, repairs and maintenance of the additional units are considered, the present value of the future operating surpluses are minimal.

Table 1. Project Capital Costs with and Without Childcare and Difference in Number of Units

Project	Capital Cost			Total Units		
	With Childcare	Without Childcare	Difference	With Childcare	Without Childcare	Difference
119B Ave, Pitt Meadows	\$45.87M	\$45.72M	+\$0.15M	122	128	(6)
7388 Southwynde, Burnaby	\$45.41M	\$45.43M	+\$0.02M	122	125	(3)
123 E 23 St, North Vancouver*	\$42.57M	\$39.64	+\$2.93M	95	89	+6
Eastburn Square, Burnaby (in-home daycare unit)	\$63.87M	\$63.87M	n/a	172	172	May impact unit mix but not overall units
Heather Place B, Vancouver (in-home daycare unit)	\$37.7M	\$37.7M		87	87	

**This concept is slightly different than the others in that the layout with childcare actually supports more units (with a slightly different unit mix). This is the main reason for a higher capital cost on this option.*

RECOMMENDATION

Staff will continue to explore mechanisms for external funding support and continue to assess financial and other implications of childcare amenities on a project-by-project basis. However, based on the analysis for these five new and redevelopment projects, staff recommend that MVH proceed with childcare facilities as it would with any other amenity space. This would mean building the space and providing interior finishes and equipment, but not capital purchases related to operations of the childcare space (e.g., transportation, unfixed furniture and play equipment). This will help the projects move forward with or without provincial funding, and allow future operators to apply for funding to ‘outfit’ the space as needed. If MVH receives funding from the New Child Care Spaces Fund, this will essentially lessen MVH’s equity contributions, rather than covering essential capital costs to build the facilities.

ALTERNATIVES

1. That the MVHC Board endorse the recommended approach to proceed with integrated childcare facilities as a priority amenity in new developments if external funding support is not available.
2. That the Housing Committee receive the report dated December 10, 2020, titled “Metro Vancouver Housing – Approach to Integrated Childcare Facilities if Funding Support is Not Available” and provide alternate direction to staff.

FINANCIAL IMPLICATIONS

As the capital costs approved by the MVHC Board for the five development projects noted in this report include the proposed childcare facilities, there are no further financial implications. If MVH receives funding from the New Child Care Spaces Fund, this will lessen MVH’s equity contributions, rather than covering essential capital costs to build the facilities. All work to develop this report was undertaken with existing staff resources within the Board approved 2020 budget.

CONCLUSION

Early in 2020, the Housing Committee directed staff to explore opportunities to integrate childcare facilities in new MVH developments, and to seek funding from the Childcare BC New Spaces Fund. MVH identified opportunities for childcare facilities or in-home day-care units in five of its new developments, and has applied for provincial funding support.

As a competitive program, childcare funding is not guaranteed. Given the cost of construction escalation, MVH is striving to keep projects moving ahead and must confirm whether it will proceed with the childcare facilities with or without funding support. This report explores the capital and long-term financial implications of the proposed childcare facilities and finds the impacts are quite minimal. If MVH receives funding from the New Child Care Spaces Fund, this will essentially lessen MVH's equity contributions, rather than covering essential capital costs to build the facilities. Staff recommend alternative one, that MVH proceed with childcare facilities in its upcoming development priorities.

42769930

To: Metro Vancouver Housing Committee

From: George Friedrich, Energy Management Engineer, Liquid Waste Services
Amy Thai, Environmental Technician II, Planning and Environment

Date: October 14, 2020 Meeting Date: January 13, 2021

Subject: **Managing Metro Vancouver Housing Energy and Greenhouse Gas Emissions – 2014 to 2018**

RECOMMENDATION

That the MVHC Board receive for information the report dated October 14, 2020, titled “Managing Metro Vancouver Housing Energy and Greenhouse Gas Emissions – 2014 to 2018”.

EXECUTIVE SUMMARY

This report follows publication of the report titled *Managing Metro Vancouver’s Corporate Energy and Greenhouse Gas Emissions (2014 to 2018)* that was received by Metro Vancouver Climate Action Committee at its September 18, 2020 meeting.

Metro Vancouver Housing uses energy to heat, light, and ventilate its portfolio of residential buildings, to manage solid waste generated at those buildings, and to operate its small fleet of vehicles. Energy use represents one of Metro Vancouver Housing’s largest operating costs and is the primary source of its greenhouse gas (GHG) emissions. For the period of 2014 through 2018, this report provides an update on Metro Vancouver Housing energy trends and actions to improve energy efficiency, support a transition to renewable energy, and achieve GHG emissions reductions, in the context of the *Metro Vancouver Housing 10-Year Plan*, the *Corporate Energy Management Policy*, *Climate 2050*, and new regional GHG reduction targets. Over the period reported, Metro Vancouver Housing has improved energy performance by 10%, has reduced energy costs by 2%, and has reduced GHG emissions related to energy use by 8%. This report also highlights potential challenges that staff have identified that could impede cost-effectively achieving the energy efficiency and GHG emissions reduction goals established in the *Metro Vancouver Housing 10-Year Plan*.

PURPOSE

To inform the Housing Committee and MVHC Board of trends in Metro Vancouver Housing’s energy use, energy costs, and greenhouse gas emissions from 2014 through 2018 and to provide highlights of Metro Vancouver Housing’s energy- and climate-related projects and initiatives completed over the same period.

BACKGROUND

At its meeting on March 29 2019, the Housing Committee received a report titled “Energy Management Update – Metro Vancouver Housing”. At that meeting, the Committee expressed interest in receiving periodic updates on Metro Vancouver energy management.

This report provides an overview of Metro Vancouver Housing’s energy use, cost, and GHG emissions trends as well as highlights of completed and ongoing Metro Vancouver projects and activities related to energy and GHG emissions management. The report will be updated on an annual basis to track Metro Vancouver Housing’s performance in managing energy and GHG emissions.

ENERGY AND GREENHOUSE GAS EMISSIONS MANAGEMENT

Metro Vancouver’s Energy Management Program was established in 2010 and its Corporate *Energy Management Policy* was adopted by the Board in 2014. Energy Management staff work closely with Metro Vancouver Housing to assist in realizing the policy objective of “continuously improving energy performance”.

Energy use is a significant operating cost for Metro Vancouver Housing, and effective energy management contributes to providing affordable housing in the region. In 2018, Metro Vancouver Housing set a target to reduce its 2019 GHG emissions from energy use in its buildings by 2% compared to 2018. Effective capital planning that includes an energy management lens is critical in achieving this goal.

The attached technical report provides additional detail related to the information summarized in this report and provides comparison of Metro Vancouver Housing’s performance to that of corporate Metro Vancouver (Attachment).

ENERGY USE, COST, AND GHG EMISSIONS TRENDS

In 2018, Metro Vancouver Housing accounted for 4% of total Metro Vancouver corporate energy use, 4% of energy costs, and 11% of energy-related GHG emissions. Metro Vancouver Housing is Metro Vancouver’s largest consumer of natural gas, and the GHG emissions associated with the operation of Metro Vancouver Housing buildings are predominantly driven by natural gas consumption. Additional detail is provided in Section 2 of the Attachment.

ENERGY KEY PERFORMANCE INDICATOR TRENDS

Metro Vancouver’s *Corporate Energy Management Policy* commits the organization to continuous improvement in energy performance. Because energy use is often driven by variables outside Metro Vancouver’s control, key performance indicators (KPIs) have been established for each of Metro Vancouver’s functions to monitor progress toward meeting the objective of continuous improvement. The factors that most influence the amount of energy Metro Vancouver Housing uses are a combination of total conditioned (heated and ventilated) floor space of the building portfolio and outdoor air temperature.

Metro Vancouver Housing investments in energy efficient mechanical equipment, appliances, lighting systems, and a building envelope improvement since 2014 have resulted in measurable improvements in energy performance KPIs. Additional natural gas savings have been realized through tenant energy awareness campaigns conducted at seven Metro Vancouver Housing sites. Compared to 2014, Metro Vancouver Housing’s 2018 KPIs improved by 10% for energy use, 2% for energy cost, and 8% for GHG emissions related to energy use. Additional detail is provided in Attachment 1.

CORPORATE POLICY IMPLEMENTATION AND INITIATIVE UPDATE

Metro Vancouver has developed a number of policies and undertaken initiatives aimed at improving energy efficiency to help manage operating costs and GHG emissions. This section provides an update on Metro Vancouver Housing's progress toward implementing these policies and participating in these initiatives. Policy context and additional detail is provided in Section 4 of Attachment 1.

Corporate Energy Management Policy Implementation / Housing 10-Year Plan

Metro Vancouver Housing set a target to reduce its 2019 GHG emissions from energy use in its buildings by 2% compared to 2018. The *Metro Vancouver Housing 10-Year Plan* outlines Metro Vancouver Housing's commitment to sustainability and includes the following targets for energy efficiency and GHG emissions reduction that align with *Climate 2050* objectives:

- Reduce GHG emissions in housing portfolio by 45% (from 2010 levels) by 2030 to work towards the region's goal of being carbon neutral by 2050; and
- Reduce energy consumption by 25% for ongoing major rehabilitations, such as building envelope upgrades, and for new construction (from 2015 National Energy Code for Buildings).

Metro Vancouver Housing has adopted decision processes based on life cycle cost analysis (including Metro Vancouver's carbon price) that favour energy-efficient, lower-carbon options.

Carbon Price Policy Implementation

When replacing mechanical equipment (space heating boilers, water heaters, ventilation systems, etc.) and lighting systems, Metro Vancouver Housing completes options analysis to inform decision making. The analysis considers life cycle costs and Metro Vancouver's corporate carbon price to rank the options in terms of net present value. Currently-available electric heat pump technology could replace natural gas use and reduce Metro Vancouver Housing GHG emissions from building energy use by more than 90%.

To date, the carbon price has strengthened the already-positive business case for high efficiency natural gas equipment but has not been successful in financially justifying investment in the lowest-carbon electric option. Metro Vancouver Housing's experience suggests that, with existing external financial incentives, a carbon price of approximately \$220 per tonne CO_{2e} would be required to generate a positive net present value for this type of investment. The current Metro Vancouver carbon price is \$150 per tonne CO_{2e}. Although transitioning from natural gas to electricity for facility thermal demands will significantly reduce GHG emissions related to these demands, electrification options tend to carry significantly higher capital, operations, and maintenance costs. Metro Vancouver Housing will require a means of funding these additional costs to make the transition away from natural gas financially sustainable.

Fleet Planning and Acquisition Policy

The Metro Vancouver Housing fleet increased in size by 18% (from 11 to 13 vehicles) from 2016 to 2018. While the Metro Vancouver Housing fleet is currently fueled solely by fossil fuels, work is underway by the corporate Fleet Management team for appropriate lower carbon and zero emission vehicles.

Climate 2050 Implementation

The *Climate 2050* Buildings Roadmap is applicable to Metro Vancouver Housing and will identify the goals, strategies, and actions to reduce greenhouse gas emissions from buildings by improving energy efficiency and switching to low carbon energy systems such as district energy, electric heat pumps, solar, geo-exchange, and/or renewable natural gas. A draft discussion paper for the Buildings issue area was received by the MVRD Board in October 2019, and engagement planned for 2020 based on this discussion paper will guide the development of the Buildings Roadmap. The first iteration of the Buildings Roadmap is expected to be completed in Q4 2020, and will inform continued climate action in this issue area by Metro Vancouver.

Sustainable Infrastructure and Buildings Policy Implementation

In 2019, work began to develop a Sustainable Infrastructure and Buildings Design Guide to facilitate and support the successful application of the policy to new infrastructure and building projects as well as significant retrofits to existing infrastructure and buildings. Metro Vancouver Housing staff will participate in the development of guidelines for multi-unit residential buildings.

ALTERNATIVES

This is an information report. No alternatives are presented.

FINANCIAL IMPLICATIONS

In 2018, Metro Vancouver Housing spent approximately \$1.1 million on energy. Energy unit rates (for electricity in particular) are expected to increase over time. A robust Energy Management Program – including processes to identify and implement energy savings opportunities in the operation, maintenance, and replacement of existing building stock and to ensure new building stock is designed with an energy-efficiency lens – helps Metro Vancouver Housing fulfill its mandate to provide affordable housing to the region by significantly mitigating escalating operating costs. Total estimated savings for Metro Vancouver Housing energy efficiency project completions from 2014 through 2018 are \$69,500/year.

Since 2016, FortisBC has contributed \$60,000 annually toward the salary of energy management staff focused on natural gas conservation and working almost exclusively with Metro Vancouver Housing. Beyond the salary contribution, this position has secured an additional \$234,557 in FortisBC and BC Housing incentive funding for Metro Vancouver Housing's energy efficiency improvement projects. BC Hydro also contributes to Metro Vancouver's Energy Management Program on a performance basis and in the form of salary contribution (up to \$91,000 annually) for one dedicated energy management staff focusing on electricity conservation across the organization, access to energy study funding, and access to capital incentives for energy-efficient equipment.

Metro Vancouver Housing has incorporated life cycle cost analysis into planning and processes as part of implementing the *Corporate Energy Management Policy* and the *Carbon Price Policy*. Use of Metro Vancouver's carbon price in life cycle cost analyses to inform project decisions may have implications on the capital costs and operating costs of future projects.

SUMMARY / CONCLUSION

In 2018, Metro Vancouver Housing spent over \$1.1 million on purchased energy and this energy use resulted in GHG emissions of 2,200 tonnes CO₂e. From 2014 through 2018, Metro Vancouver Housing invested in energy-efficient equipment that has reduced its weather-adjusted energy use by over 10%, weather-adjusted energy costs by 2%, and weather-adjusted GHG emissions from energy use by 8%. These projects have reduced annual energy costs by almost \$70,000 and annual GHG emissions by 280 tonnes CO₂e and have buffered Metro Vancouver Housing against the effects of energy rate increases.

In 2018, Metro Vancouver Housing set a target to reduce its 2019 GHG emissions from energy use in its buildings by 2% compared to 2018 and has established additional GHG and energy targets in the Metro Vancouver Housing 10-Year Plan. Metro Vancouver Housing has implemented a decision process based on options analyses that aims to identify asset investment opportunities with the lowest life cycle cost (incorporating Metro Vancouver's carbon price).

Over the next 10 years, Metro Vancouver Housing will be focused on new construction and major rehabilitation of existing housing stock. This presents a significant opportunity to shift from fossil fuel use towards lower- or zero-carbon energy alternatives, which aligns with the Board-adopted regional target of a carbon neutral region by 2050, as articulated in the *Climate 2050* strategy.

Attachment: (39515340)

Metro Vancouver Housing Annual Energy and Greenhouse Gas Emissions Management Report – 2014 to 2018

39515761

**Metro Vancouver Housing Corporation
Annual Energy and Greenhouse Gas Emissions
Management Report
2014 to 2018**

October 14, 2020

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1. INTRODUCTION

Metro Vancouver Housing Corporation (Metro Vancouver Housing) uses electricity to light, ventilate, and, in some cases, heat its buildings. It purchases and uses natural gas and steam for space heating and natural gas for domestic hot water heating. It operates a small fleet of vehicles and manages municipal solid waste generated at its sites. This report presents Metro Vancouver Housing trends in energy use, energy cost, and greenhouse gas (GHG) emissions related to energy use for the period of 2014 through 2018 and compares them against trends for the corporation of Metro Vancouver as a whole. The report also provides an update on progress that Metro Vancouver Housing has made in implementing Metro Vancouver policies related to energy management and GHG emissions management and the role Metro Vancouver Housing plays in participating in various energy- and climate-related corporate initiatives.

2. ENERGY USE, COST AND GHG EMISSIONS TRENDS

With the objectives of reducing corporate GHG emissions and helping to manage operating costs, Metro Vancouver's Corporate Energy Management Policy commits the organization to continuously improving the efficiency with which it produces and uses energy. This section summarizes overall trends for corporate Metro Vancouver's energy use, energy costs, and GHG emissions related to energy use. It then compares these corporate trends to those related specifically to Metro Vancouver Housing.

2.1 ENERGY UNIT COSTS

Energy costs play a significant role in the analyses and discussions that follow. Energy costs are driven by a combination of energy consumption – over which Metro Vancouver has a degree of control – and energy unit rates (\$/gigajoule (GJ)) over which Metro Vancouver has no control. Table 1 provides trends for aggregate energy unit rates (total cost divided by total energy use) for corporate Metro Vancouver and Metro Vancouver Housing from 2014 through 2018.

Table 1: Aggregate Energy Unit Rates

Metro Vancouver Aggregate Energy Unit Rates (\$/GJ)									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Electricity	\$ 23.01	\$ 23.98	\$ 26.21	\$ 26.58	\$ 25.20	4%	14%	16%	10%
Stationary Fuels	\$ 12.39	\$ 11.55	\$ 12.04	\$ 9.04	\$ 11.04	-7%	-3%	-27%	-11%
Steam	\$ 20.43	\$ 18.73	\$ 17.93	\$ 19.91	\$ 20.88	-8%	-12%	-3%	2%
Mobile Energy	\$ 36.27	\$ 26.22	\$ 30.25	\$ 32.61	\$ 32.90	-28%	-17%	-10%	-9%
Housing Aggregate Energy Unit Rates									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Electricity	\$ 29.38	\$ 31.49	\$ 32.85	\$ 34.10	\$ 34.98	7%	12%	16%	19%
Stationary Fuels	\$ 10.43	\$ 8.71	\$ 8.48	\$ 8.90	\$ 9.77	-16%	-19%	-15%	-6%
Steam	\$ 20.43	\$ 18.73	\$ 17.93	\$ 19.91	\$ 20.88	-8%	-12%	-3%	2%
Mobile Energy	\$ 36.50	\$ 31.76	\$ 29.08	\$ 33.95	\$ 35.39	-13%	-20%	-7%	-3%

Notes:

Decrease (change less than zero)

Increase (change greater than zero)

Since 2018, fossil fuel rates (Stationary Fuels, Steam, and Mobile Energy in Table 1) have generally fluctuated below 2014 levels for both corporate Metro Vancouver and Metro Vancouver Housing. Electricity rates generally increase year to year. Metro Vancouver’s three largest BC Hydro accounts are billed at a significantly lower energy rate than other accounts; Annacis Island Wastewater Treatment Plant (AIWWTP) is one of those three accounts. Although BC Hydro rates increase every year, the decrease in the corporate Metro Vancouver 2018 aggregate electricity rates compared to 2017 is a result of more electricity purchased (at the lower energy rate) by AIWWTP with the cogeneration engines out of service. Housing electricity unit rates increased steadily over the five-year period.

2.2 DEPARTMENTAL TRENDS

Figure 1 presents the distribution of 2018 energy use, energy costs, and GHG emissions from energy use amongst Metro Vancouver departments.

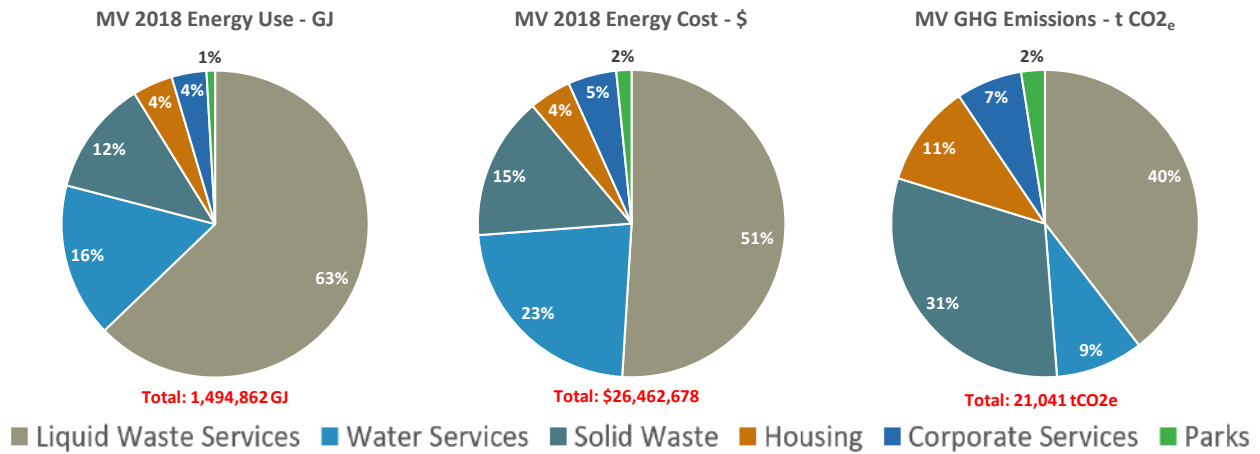


Figure 1: 2018 Departmental Energy Distribution

GHG emissions intensities are greatest for fossil fuels such as natural gas, diesel, gasoline, and propane. In contrast, grid electricity in British Columbia is hydroelectrically generated and therefore considered a clean, renewable source of energy. In 2018, Metro Vancouver Housing accounted for 4% of total Metro Vancouver corporate energy use, 4% of energy costs, and 11% of GHG emissions from energy use. Metro Vancouver Housing is Metro Vancouver’s largest departmental consumer of natural gas. Metro Vancouver Housing GHG emissions are predominantly driven by natural gas consumption. Figure 2 presents five-year departmental trends for energy use, energy cost, and GHG emissions from energy use.

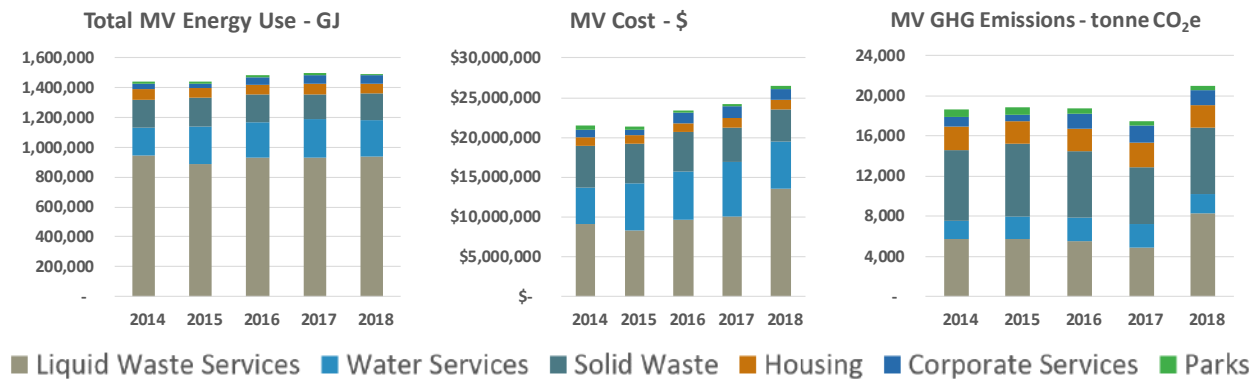


Figure 2: Five-Year Trends by Department

Table 2 summarizes the energy trends for corporate Metro Vancouver and Metro Vancouver Housing, showing percent changes for each metric compared to 2014. Trends for all Metro Vancouver departments are provided in Appendix A.

Table 2: Trends by Department

Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	1,442,301	1,442,212	1,486,436	1,498,215	1,494,862	-0.01%	3%	4%	4%
Total Cost (\$)	\$ 21,437,482	\$ 21,411,027	\$ 23,428,066	\$ 24,235,895	\$ 26,462,678	0%	9%	13%	23%
Total GHG Emissions (t CO2e)	18,623	18,810	18,742	17,439	21,041	1%	0.6%	-6%	13%
Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	66,969	63,376	63,517	67,531	63,404	-5%	-5%	0.8%	-5%
Total Cost (\$)	\$ 1,133,904	\$ 1,038,603	\$ 1,055,580	\$ 1,182,707	\$ 1,170,949	-8%	-7%	4%	3.3%
Total GHG Emissions (t CO2e)	2,362	2,245	2,243	2,424	2,272	-5%	-5%	3%	-4%

Notes:

Improvement / Favourable (change less than zero)

Degradation / Unfavourable (change greater than zero)

Since 2014, corporate Metro Vancouver has experienced an increase of approximately 4% since 2014 with costs increasing by 23% over the same period. In 2018, GHG emissions increased by 13% compared to 2014. This trend is due to significant increases in fossil fuel use by Liquid Waste Services (for residuals management) and Solid Waste Services (Metro Vancouver Waste to Energy Facility operation).

As seen in Table 2, Metro Vancouver Housing's performance exceeds that of corporate Metro Vancouver in aggregate for all metrics and across the entire period reported. These improvements are the result of investment in high-efficiency space heating, domestic hot water heating, lighting, and laundry appliances as will be detailed in later sections.

2.3 TRENDS BY ENERGY CLASS

Metro Vancouver classifies the energy it uses as either Stationary Energy or Mobile Energy. Stationary Energy is defined as energy used to power stationary equipment and includes purchased electricity, self-generated electricity, purchased natural gas, purchased steam, self-generated heat, and other purchased fuels (e.g. diesel, gasoline, propane). Mobile Energy is defined as energy sources used to power mobile vehicles/equipment and includes fossil fuels (e.g., diesel, gasoline, propane, natural gas, liquefied natural gas) and electricity.

Figure 3 shows the five-year total energy (Stationary and Mobile) use, cost, and GHG emissions trends for corporate Metro Vancouver and Metro Vancouver Housing. Accurate data is not yet available for electricity used for electric vehicles in the Metro Vancouver fleet, but will be reported when available.

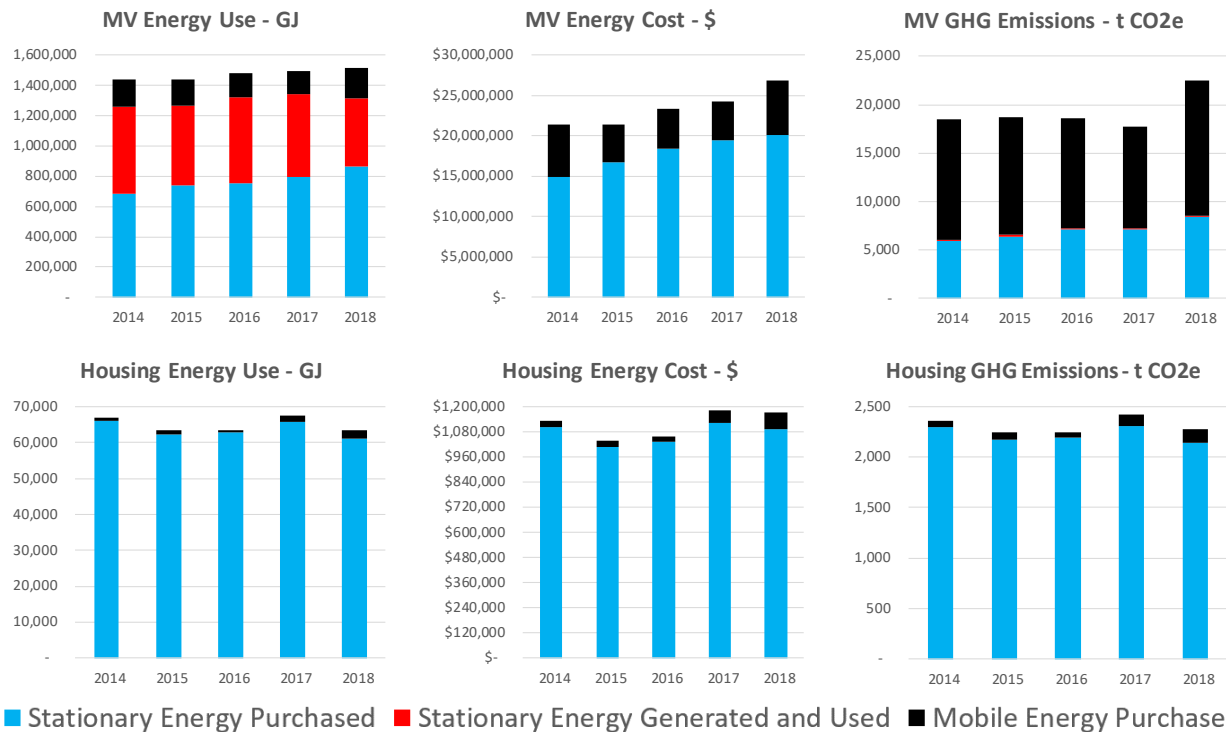


Figure 3: Stationary vs. Mobile Energy

Metro Vancouver Housing’s share of corporate energy use and energy costs is relatively small. However, Metro Vancouver Housing’s share of GHG emissions from stationary energy sources is significant. Table 3 summarizes the data presented in Figure 3 and provides percent changes for each variable compared to 2014. In 2018 collection and reporting began of vehicular fuel use data related to management of municipal solid waste generated at Metro Vancouver Housing sites.

Table 3: Stationary vs. Mobile Energy

Energy Used (GJ) - Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	683,640	743,265	757,031	795,786	866,886	9%	11%	16%	27%
Stationary Energy Generated and Used	577,165	520,830	564,776	546,885	445,701	-10%	-2%	-5%	-23%
Mobile Energy Purchased	179,486	176,043	162,151	149,766	206,384	-2%	-10%	-17%	15%
Total Energy Used	1,440,291	1,440,138	1,483,958	1,492,437	1,518,971	0%	3%	4%	5%
Energy Cost - Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	\$ 14,851,996	\$ 16,729,887	\$ 18,446,304	\$ 19,411,766	\$ 20,133,424	13%	24%	31%	36%
Stationary Energy Generated and Used	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
Mobile Energy Purchased	\$ 6,509,091	\$ 4,615,071	\$ 4,905,652	\$ 4,883,512	\$ 6,791,072	-29%	-25%	-25%	4%
Total Energy Used	\$ 21,361,087	\$ 21,344,959	\$ 23,351,956	\$ 24,295,278	\$ 26,924,496	0%	9%	14%	26%
GHG Emissions from Energy Use (t CO2e) - Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	5,895	6,391	7,119	7,088	8,400	8%	21%	20%	43%
Stationary Energy Generated and Used	167	151	160	156	120	-10%	-5%	-7%	-28%
Mobile Energy Purchased	12,424	12,127	11,293	10,470	13,958	-2%	-9%	-16%	12%
Total Energy Used	18,486	18,669	18,572	17,714	22,478	1%	0%	-4%	22%
Energy Used (GJ) - Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	66,081	62,383	62,794	65,770	61,131	-6%	-5%	-0.5%	-7%
Stationary Energy Generated and Used	-	-	-	-	-	-	-	-	-
Mobile Energy Purchased	888	992	723	1,760	2,273	12%	-19%	98%	156%
Total Energy Used	66,969	63,376	63,517	67,531	63,404	-5%	-5%	1%	-5%
Energy Cost - Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	\$ 1,101,503	\$ 1,007,083	\$ 1,034,552	\$ 1,122,955	\$ 1,090,514	-9%	-6%	2%	-1%
Stationary Energy Generated and Used	\$ -	\$ -	\$ -	\$ -	\$ -	-	-	-	-
Mobile Energy Purchased	\$ 32,401	\$ 31,520	\$ 21,028	\$ 59,751	\$ 80,435	-3%	-35%	84%	148%
Total Energy Used	\$ 1,133,904	\$ 1,038,603	\$ 1,055,580	\$ 1,182,707	\$ 1,170,949	-8%	-7%	4%	3.3%
GHG Emissions from Energy Use (t CO2e) - Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Stationary Energy Purchased	2,301	2,178	2,193	2,304	2,147	-5%	-5%	0%	-7%
Stationary Energy Generated and Used	-	-	-	-	-	-	-	-	-
Mobile Energy Purchased	60	67	50	120	125	12%	-18%	99%	107%
Total Energy Used	2,362	2,245	2,243	2,424	2,272	-5%	-5%	3%	-4%

Notes:

Improvement / Favourable (change less than zero)

Degradation / Unfavourable (change greater than zero)

Metro Vancouver Housing does not self-generate energy as do Liquid Waste Services and Water Services. Over the period reported, Metro Vancouver Housing has out-performed corporate Metro Vancouver trends for stationary energy use and total energy use. Fluctuations in Metro Vancouver Housing mobile energy indicators is driven by variable Metro Vancouver Housing fleet fuel consumption. Reporting of Housing solid waste management fuel data began in 2018, which contributed to the increases in mobile energy indicators seen in that year.

2.4 STATIONARY ENERGY TRENDS BY ENERGY TYPE

Metro Vancouver Housing uses electricity to light, ventilate, and, in some cases, heat its buildings. It uses natural gas and steam for space heating and natural gas for domestic hot water heating. For each of these energy sources, Table 4 details trends in use, cost, and GHG emissions from 2014 through 2018.

Table 4: Stationary Energy Drivers, Energy Use, Cost & GHG Emissions Trends

HOUSING - ENERGY DRIVERS, ENERGY USE, COST & GHG EMISSIONS TRENDS										
KPI DRIVERS						Percent Change Relative to 2014				
	2014	2015	2016	2017	2018	2015	2016	2017	2018	
Total Heating Degree Days (HDD)	2634	2497	2543	2925	2767	-5%	-3%	11%	5%	
Conditioned Floorspace (m2)	284768	284768	284768	284768	284768	0%	0%	0%	0%	
KPI Denominator [(m2/1000000)*HDD]	750	711	724	833	788	-5%	-3%	11%	5%	
ENERGY USED (GJ)						Percent Change Relative to 2014				
	2014	2015	2016	2017	2018	2015	2016	2017	2018	
Total Electricity Used	21,352	20,051	20,284	21,045	19,365	-6%	-5%	-1%	-9%	
Total Thermal Energy ⁺ Used	44,730	42,332	42,510	44,725	41,766	-5%	-5%	0%	-7%	
Total Mobile Energy Used	888	992	723	1,760	2,273	12%	-19%	98%	156%	
Total Energy ^{**} Used (GJ)	66,969	63,376	63,517	67,531	63,404	-5%	-5%	1%	-5%	
% Renewable Energy Use	31.9%	31.6%	31.9%	31.2%	30.5%	-1%	0%	-2%	-4%	
ENERGY COST (\$)						Percent Change Relative to 2014				
	2014	2015	2016	2017	2018	2015	2016	2017	2018	
Total Electricity Cost	\$ 627,379	\$ 631,425	\$ 666,292	\$ 717,570	\$ 677,370	1%	6%	14%	8%	
Total Thermal Energy ⁺ Cost	\$ 474,125	\$ 375,657	\$ 368,260	\$ 405,386	\$ 413,145	-21%	-22%	-14%	-13%	
Total Mobile Energy Cost	\$ 32,401	\$ 31,520	\$ 21,028	\$ 59,751	\$ 80,435	-3%	-35%	84%	148%	
Total Energy ^{**} Cost	\$ 1,133,904	\$ 1,038,603	\$ 1,055,580	\$ 1,182,707	\$ 1,170,949	-8%	-7%	4%	3%	
GHG EMISSIONS FROM ENERGY USED (tonne CO ₂ e)						Percent Change Relative to 2014				
	2014	2015	2016	2017	2018	2015	2016	2017	2018	
Total GHG Emissions from Electricity Use (tonne CO ₂ e)	59	56	60	62	57	-6%	1%	5%	-3%	
Total GHG Emissions from Thermal Energy ⁺ Use (tonne CO ₂ e)	2,242	2,122	2,133	2,241	2,090	-5%	-5%	0%	-7%	
Total GHG Emissions from Mobile Energy Use (tonne CO ₂ e)	60	67	50	120	125	12%	-18%	99%	107%	
Total GHG Emissions from Total Energy ^{**} Use (tonne CO ₂ e)	2,362	2,245	2,243	2,424	2,272	-5%	-5%	3%	-4%	

Notes

Thermal Energy⁺ = Natural Gas Purchased + Steam Purchased
 Total Energy^{**} = Electricity + Natural Gas + Steam + Mobile Energy
 Renewable Energy^{**} = energy derived from non-fossil sources

Electricity use has decreased by 9% since 2014 primarily as a result of lighting and laundry appliance efficiency improvements. Decreases in thermal energy use (natural gas and steam) are attributed primarily to one building envelope upgrade in 2016 along with several space heating boiler and domestic hot water heating system upgrades detailed in Section 5.1. Trends shown in Table 4 are variable as natural gas consumption and to a lesser degree electricity consumption are linked to outdoor air temperatures during the heating season, which are also variable. Mobile energy increases are the result of increased Metro Vancouver Housing fleet fuel use and the addition of solid waste management fuel reporting in 2018.

Metro Vancouver Housing electricity costs increased steadily over the period reported (8% increase in 2018 compared to 2014) but not as dramatically as electricity unit rates for the Housing portfolio (19% increase in 2018 compared to 2014 as shown in Table 1). Metro Vancouver Housing's energy efficiency investments have tempered the full impact of electricity rate increases.

Overall, GHG emissions from energy use have shown a downward trend over the period reported. This trend is primarily due to investments in energy-efficient natural gas space heating and domestic

hot water heating equipment, a building envelope upgrade, lighting efficiency upgrades, and laundry appliance efficiency improvements.

2.5 ENERGY KEY PERFORMANCE INDICATOR TRENDS

Metro Vancouver's Corporate Energy Management Policy commits the organization to continuous improvement in energy performance. Because energy use is often driven by variables outside Metro Vancouver's control, key performance indicators (KPIs) have been established for corporate Metro Vancouver and for each department to monitor progress toward meeting the continuous improvement objective. Metro Vancouver's energy performance driver is population; Metro Vancouver Housing's energy performance driver is a combination of total conditioned (heated and ventilated) floorspace of the portfolio and regional outdoor air temperature as quantified by annual heating degree days (HDD¹). As such, corporate Metro Vancouver KPIs are energy use per capita (GJ/capita), energy cost per capita (\$/capita), and GHG emissions from energy use per capita (kg CO₂e/capita). Metro Vancouver Housing KPIs are weather-adjusted energy use per square metre of conditioned floorspace (kJ/(m²*HDD)), weather-adjusted energy cost per square metre of conditioned floorspace (\$/(million m²*HDD)), and weather-adjusted GHG emissions from energy use per square metre of conditioned floorspace (g CO₂e/(m²*HDD)).

Figure 4 presents energy KPI trends for corporate Metro Vancouver and for Metro Vancouver Housing. KPI trends for all Metro Vancouver departments are provided in Appendix A.

¹ A heating degree day (HDD) is the recognized energy management metric used to quantify the energy required to heat a building. It is the number of degrees that a day's average temperature is below 18 °Celsius. Annual HDD is the summation of daily HDDs over the course of a year.

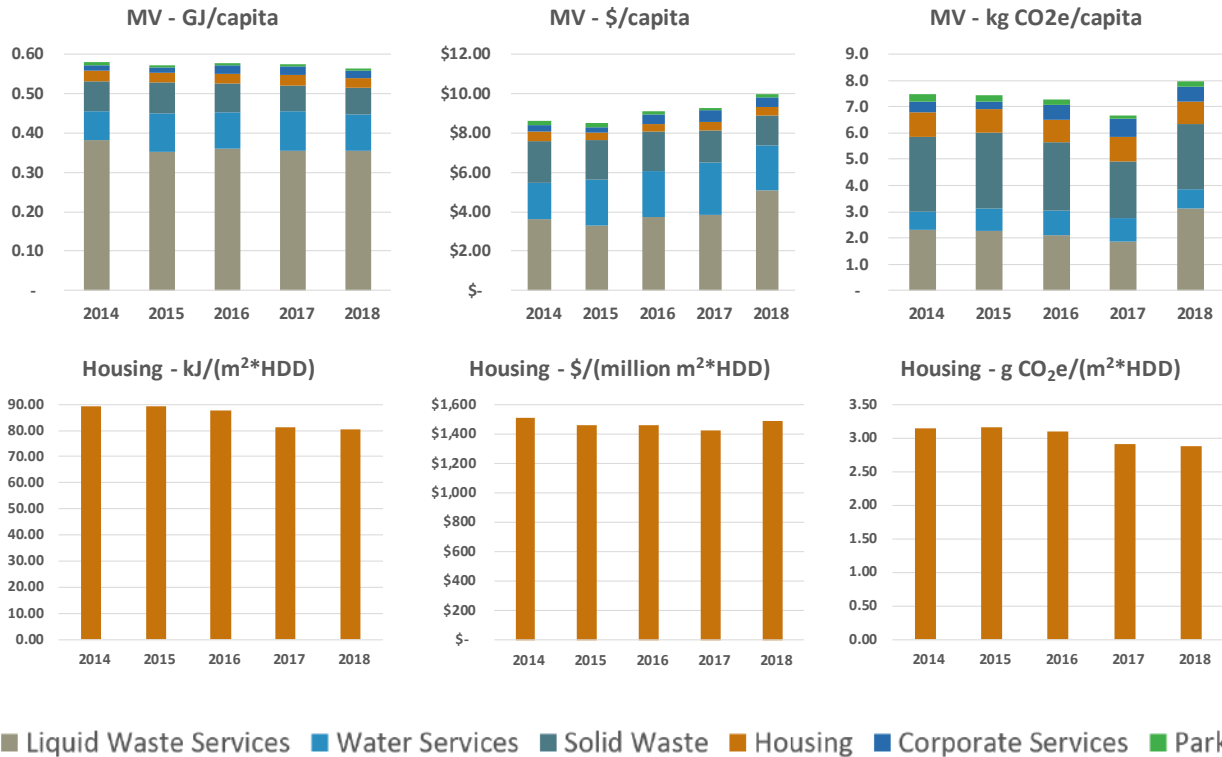


Figure 4: Energy KPI Trends

Table 5 summarizes the energy performance KPI trends presented in Figure 4 for corporate Metro Vancouver and Metro Vancouver Housing. Table 5 also provides percent changes for each metric (energy driver, energy use KPI, energy cost KPI, and GHG emissions from energy use KPI) compared to 2014.

Table 5: Energy Performance KPI Trends

Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Population	2,487,879	2,524,714	2,575,540	2,610,929	2,648,493	1%	4%	5%	6%
GJ/capita	0.580	0.571	0.577	0.574	0.564	-1%	-0.4%	-1%	-3%
\$/capita	\$ 8.62	\$ 8.48	\$ 9.10	\$ 9.28	\$ 9.99	-2%	6%	8%	16%
kg CO2e/capita	7.5	7.5	7.3	6.7	7.9	-0.5%	-3%	-11%	6%
Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Million m ² *HDD	750	711	724	833	788	-5%	-3%	11%	5%
kJ/(m ² *HDD)	89.28	89.13	87.71	81.07	80.47	-0.2%	-2%	-9%	-10%
\$/million m ² *HDD	\$ 1,512	\$ 1,461	\$ 1,458	\$ 1,420	\$ 1,486	-3%	-4%	-6%	-2%
g CO2e/(m ² *HDD)	3.15	3.16	3.10	2.91	2.88	0.3%	-2%	-8%	-8%

Notes:

Improvement / Favourable (change less than zero)

Degradation / Unfavourable (change greater than zero)

Data indicates that, with the exception of the 2015, energy and GHG emissions from energy use KPIs, Metro Vancouver Housing’s performance exceeds that of corporate Metro Vancouver in aggregate for all metrics and across the entire period reported. As previously discussed, these trends are a result of investment in energy-efficient mechanical equipment, laundry appliances, lighting systems, and a building envelope upgrade. Additional natural gas savings have been realized through tenant energy awareness campaigns conducted at seven Metro Vancouver Housing sites.

3. NON-ENERGY GHG EMISSIONS TRENDS

GHG emissions from energy are expected to be Metro Vancouver Housing’s largest source of emissions. An official inventory of non-energy emissions – such as from refrigerants – has not yet been completed for Metro Vancouver Housing.

4. CORPORATE POLICY IMPLEMENTATION AND INITIATIVE UPDATE

Since 2014, Metro Vancouver has developed a number of policies and initiatives aimed at managing energy costs and GHG emissions. This section provides an update on Metro Vancouver Housing’s progress toward implementing these policies and participating in these initiatives.

4.1 CORPORATE ENERGY MANAGEMENT POLICY

The *Corporate Energy Management Policy* was adopted by the Board in 2014. The policy articulates Metro Vancouver’s commitment to continuously improving energy efficiency in its operations, and to continuously improving the efficiency of energy production, generation, and recovery. It also

provides direction for staff to put processes in place to effectively manage energy following International Organization for Standardization (ISO) energy management practices. The following table provides a summary of progress Metro Vancouver Housing has made in implementing the *Corporate Energy Management Policy*.

Table 6: Corporate Energy Management Policy Implementation Status – Housing

Policy Directive	Status
<ul style="list-style-type: none"> Establish substantiated, realistic, and measurable targets that motivate continuous improvement and are consistent with other objectives. 	<ul style="list-style-type: none"> In 2018, Metro Vancouver Housing became the first department to set a GHG emissions reduction target which was published in its 2019 Work Plan. Both GHG emissions reduction targets and energy performance targets have been included in the Metro Vancouver Housing 10-Year Plan (discussed below).
<ul style="list-style-type: none"> Develop a strategic energy management planning process for achieving these targets using triple bottom line analysis methods. 	<ul style="list-style-type: none"> Energy Management staff have contributed to the Metro Vancouver Housing capital planning process, resulting in life cycle options analyses being carried out on all mechanical equipment upgrades. A strategic planning process that considers energy and GHG emissions has yet to be formalized.
<ul style="list-style-type: none"> Regularly monitor and report on progress toward meeting these targets using a corporate energy and GHG tracking system. 	<ul style="list-style-type: none"> Development of a system to regularly report energy and GHG emissions and to benchmark the portfolio is underway and expected to be implemented in 2020. Reporting against the established GHG emissions reduction target will be included in this reporting. Reporting against energy performance targets will be incorporated once those targets have been established. Annual reporting to the Housing Committee will continue.
<ul style="list-style-type: none"> Establish processes that continuously improve Energy Performance in planning, design, procurement, construction, operation, and maintenance of Metro Vancouver assets and services. 	<ul style="list-style-type: none"> As noted above, Energy Management staff participate in the Metro Vancouver Housing capital planning process including development of the Metro Vancouver Housing Unit Standards in 2018. Options analysis processes have been developed and are being carried out on all mechanical equipment upgrades to identify the most energy efficient and least GHG intensive solutions on a life cycle net present value basis. This process has yet to be formalized. Energy efficiency and GHG emissions impacts will be considered in development of guidelines for the Sustainable Infrastructure and Buildings Policy (discussed below). Metro Vancouver Housing is considering adopting BC Energy Step Code 4 (the second most energy-efficient level included in the standard) for new construction and Step Code 3 for major renovations.
<ul style="list-style-type: none"> Provide access to energy information and training for staff. 	<ul style="list-style-type: none"> A Corporate energy management communication strategy is under development. The reporting system described above will become an integral component of this strategy. Energy Management staff, together with the Tenant Programs and Services Group, have completed FortisBC-funded tenant energy awareness competitions at seven sites.

Policy Directive	Status
<ul style="list-style-type: none"> Empower staff to generate solutions that meet the objectives of this policy. 	<ul style="list-style-type: none"> A formal process for identifying training needs has not yet been initiated. Processes to empower staff to meet objectives of the policy have not yet been developed. Tenant energy awareness campaigns conducted at seven Metro Vancouver Housing sites.

4.2 METRO VANCOUVER HOUSING 10-YEAR PLAN

Metro Vancouver Housing has developed a 10-Year Plan to define how the organization will provide, preserve, and expand affordable housing in the region over the next decade. The Plan outlines Metro Vancouver Housing’s commitment to sustainability and includes the following targets for energy efficiency and GHG emissions reduction that align with Climate 2050 objectives:

- Reduce GHG emissions in housing portfolio by 45% (from 2010 levels) by 2030 to work towards the region’s goal of being carbon neutral by 2050.
- Reduce energy consumption by 25% for ongoing major rehabilitations, such as building envelope upgrades, and for new construction (from 2015 National Energy Code for Buildings).

4.3 CARBON PRICE POLICY

In June 2017, the MVRD Board approved Metro Vancouver’s Carbon Price Policy. The policy is being incorporated into life cycle cost assessments during Metro Vancouver’s capital planning processes, and in particular, into financial business casing tools used for options analyses that concern energy decisions.

High-efficiency equipment can deliver significant energy and cost savings and GHG emissions reductions over its operating life, even at a premium capital cost compared to less efficient equipment. Metro Vancouver Housing completes options analysis on all lighting and mechanical equipment (boilers, water heaters, ventilation systems, etc.) replacement projects to identify the option with the lowest life cycle net present value cost while factoring in Metro Vancouver’s Corporate Carbon Price.

Currently-available electric heat pump technology could replace natural gas use and reduce Metro Vancouver Housing GHG emissions from building energy use by more than 90%. To date, the Carbon Price has strengthened the already-positive business case for high efficiency natural gas equipment but has not been successful in financially justifying investment in the lowest-carbon (electric) option. Metro Vancouver Housing experience suggests that, with existing external financial incentives, a carbon price of approximately \$220/tonne CO₂e would be required to generate a positive business case for this type of investment. The current Metro Vancouver carbon price is \$150 per tonne CO₂e. Although transitioning from natural gas to electricity for facility thermal demands will significantly reduce GHG emissions related to these demands, electrification options tend to carry significantly

higher capital, operation, and maintenance costs. Metro Vancouver Housing will require a means of funding these additional costs to make the transition away from natural gas financially sustainable.

4.4 FLEET PLANNING AND ACQUISITION POLICY

In September 2016, the Metro Vancouver Board adopted the Fleet Planning and Acquisition Policy aimed at:

- Reducing overall size of fleet
- Rightsizing vehicles (transitioning to smaller, more fuel-efficient vehicles)
- Reducing overall km traveled
- Transitioning to lower-carbon vehicles (reducing GHG emissions per km traveled)

Implementation of the policy is the responsibility of Metro Vancouver Fleet Services. Table 7 compares trends in Metro Vancouver Housing fleet energy and GHG emissions performance indicators against those of the entire Metro Vancouver fleet for 2016 (the year the policy was adopted) through 2018.

Table 7: Fleet Energy and GHG Emissions Reduction Performance Trends

Metro Vancouver				Percent Change Relative to 2016	
	2016	2017	2018	2017	2018
Fleet Size (no. vehicles)	420	424	452	1%	8%
Percent Fuelled Solely from Fossil Sources	87.4%	85.6%	84.5%	-2%	-3%
Fossil Fuel Use (GJ)	39,953	38,623	37,790	-3%	-5%
Fossil Fuel Cost	1,224,968	1,332,922	1,467,473	9%	20%
GHG Emissions from Fossil Fuel Use (t CO ₂ e)	2,722	2,628	2,571	-3%	-6%
Housing				Percent Change Relative to 2016	
	2016	2017	2018	2017	2018
Fleet Size (no. vehicles)	11	12	13	9%	18%
Percent Fuelled Solely from Fossil Sources	100.0%	100.0%	100.0%	0.0%	0.0%
Fossil Fuel Use (GJ)	723	1,760	1,165	143%	61%
Fossil Fuel Cost	21,027	59,751	44,584	184%	112%
GHG Emissions from Fossil Fuel Use (t CO ₂ e)	50	120	79	142%	60%

Notes:

Improvement / Favourable (change less than zero)

Degradation / Unfavourable (change greater than zero)

The Metro Vancouver Housing fleet increased in size by 18% (from 11 to 13 vehicles) from 2016 to 2018. The entire Metro Vancouver Housing fleet remained fueled solely by fossil fuels. Metro Vancouver Housing fleet performance for most metrics reported above has degraded since 2014 primarily as a result of increasing the size of the fleet. Reliable mileage data that would allow the indicators shown in Table 7 to be normalized against distance traveled is not currently available. Fleet Services is working to improve mileage data collection to enable this type of tracking in the future.

4.5 SUSTAINABLE INFRASTRUCTURE AND BUILDINGS POLICY

In October 2018 the Metro Vancouver Board adopted the Sustainable Infrastructure and Buildings Policy. This policy aims to ensure that the wide range of projects undertaken by Metro Vancouver are consistent in their approach to sustainable design and construction. The Policy will compel design

teams to incorporate performance-based considerations for energy efficiency and greenhouse gas emissions, sustainable and efficient use of resources, and ecological health.

In 2019 work began to develop a Sustainable Infrastructure and Buildings Design Guide to facilitate and support the successful application of the Policy to new infrastructure and building projects as well as significant retrofits to existing infrastructure and buildings. The Design Guide will provide technical guidelines to be used by the Corporation's staff and consulting teams to assist in the delivery of high-performance, sustainable infrastructure and building projects. The Policy targets Leadership in Energy and Environmental Design (LEED) Gold and BC Energy Step Code Level 3 as minimum standards for Metro Vancouver Housing buildings. Metro Vancouver Housing staff will participate in the development of guidelines for multi-unit residential buildings.

4.6 CLIMATE 2050 BUILDINGS ROADMAP

In 2019, Metro Vancouver's Board adopted the *Climate 2050² Strategic Framework*, which aims to demonstrate bold leadership in responding to climate change by ensuring our infrastructure, ecosystems, and communities are resilient to the impacts of climate change, and by pursuing a carbon neutral region by 2050 with an interim target of reducing greenhouse gas emissions by 45% from 2010 levels by 2030. To implement this strategy, Metro Vancouver is currently developing a series of Roadmaps to outline specific actions to reduce greenhouse gas emissions. Metro Vancouver can set the path towards carbon neutrality, but it will not be able to achieve the targets on its own without significant cooperation, collaboration, and commitment from member jurisdictions, other orders of government, partner organizations, stakeholders, and the public. With its regional partners, Metro Vancouver is developing the first iterations of the Climate 2050 Roadmaps in 2019 and 2020.

The Buildings Roadmap is applicable to Metro Vancouver Housing and will identify the goals, strategies, and actions to reduce greenhouse gas emissions from buildings by improving energy efficiency and switching to low carbon energy systems such as district energy, electric heat pumps, solar, or renewable natural gas. Buildings can also be made more resilient to the impacts of climate change, and such adaptation actions can change the way buildings use energy. For example, passive building designs can make residents more resilient to utility grid disruptions and rising energy prices. In addition, decentralized energy systems can ensure that, following severe weather, essential services are not disrupted and communities receive the support they need to recover.

A draft discussion paper for the Buildings issue area was received by the MVRD Board in October 2019, and engagement planned for 2020 based on this discussion paper will guide the development of the Buildings Roadmap. The first iteration of the Buildings Roadmap is expected to be completed in Q4 2020, and will inform continued climate action in this issue area by Metro Vancouver.

² Climate 2050 Website: <http://www.metrovancouver.org/climate2050>

5. ENERGY- AND CLIMATE-RELATED PROJECTS

As a signatory to the B.C. Climate Action Charter, Metro Vancouver is committed to pursuing carbon neutrality. To help facilitate this goal, the *Corporate Climate Action Plan* was developed and presented to the GVRD Board in 2010. The objective of the Plan is to become a “carbon neutral corporation resilient to the impacts of climate change”. This objective is to be achieved through three strategies:

- Reducing energy consumption through efficiencies;
- Transitioning to renewable energy; and
- Maximizing energy recovery.

Aligning with these strategies, this section provides an update regarding energy- and climate-related projects that have been completed by Metro Vancouver Housing from 2014 through 2018.

5.1 ENERGY EFFICIENCY

Table 8 summarizes estimated annual energy savings for energy efficiency projects completed by each department from 2014 through 2018. Annual savings realized in each year perpetuate in subsequent years, summing to the Cumulative Savings shown in Table 8.

Table 8: Energy Efficiency Project Activities by Department

Completed Projects - Estimated Annual Savings (GJ)							
Year of Completion	Liquid Waste Services	Water Services	Solid Waste	Housing	Corporate Services	Parks	Metro Vancouver Total
2014 Savings (GJ)	772	2,703	-	-	-	-	3,475
2015 Savings (GJ)	12,600	190	-	-	-	-	12,790
2016 Savings (GJ)	4,579	623	-	2,801	-	358	8,361
2017 Savings (GJ)	1,836	538	-	1,435	-	-	3,810
2018 Savings (GJ)	2,187	1,688	-	2,115	-	-	5,990
Total Annual Savings (GJ)	21,974	5,743	-	6,351	-	358	34,426
Cumulative Savings (2014 through 2018, GJ)	73,856	18,911	-	13,388	-	1,074	107,229

Metro Vancouver Housing energy efficiency projects account for approximately 12% of total corporate Metro Vancouver annual savings for the period reported. Total estimated savings for Metro Vancouver Housing energy efficiency project completions are 6,350 GJ/year (\$69,500/year); cumulative savings since 2014 are estimated at 13,400 GJ (\$147,000).

For the period of 2014 through 2018, Table 9 details energy efficiency project completions and annual savings by project type. Over the period reported, Metro Vancouver Housing has received more than \$230,000 in incentive funding from FortisBC and BC Housing.

Table 9: Energy Efficiency Project Summary

Project Type	Project Description	Estimated Annual Savings		
		Energy (GJ)	Cost (\$)	GHG Emissions (tCO ₂ e)
Heating Boilers	15 boilers replaced across 3 sites	2,414	\$ 18,876	120
Domestic Hot Water Heaters	5 heaters replaced across 4 sites	1,025	\$ 8,012	51
Low Flow Energy Efficient Water Fixtures	Replacement of fixtures in all suites at 14 sites	1,735	\$ 13,571	86
Heat Reflectors	Reflectors installed in all suites at 3 sites	445	\$ 3,480	22
LED Lighting Upgrades	347 fixtures replaced across 5 sites	391	\$ 13,676	1.16
Laundry Equipment Upgrades	167 Machines replaced across 35 sites	341	\$ 11,929	1.01
Total		6,351	69,544	282

5.2 ENERGY RECOVERY

Metro Vancouver Housing did not undertake any energy recovery projects during the period reported. However, several opportunities for heat recovery have been identified (e.g. recovering heat from ventilation systems) and will be evaluated as part of the capital improvement options analysis process.

5.3 TRANSITION TO RENEWABLE ENERGY

Departmentally, Metro Vancouver Housing is corporate Metro Vancouver's largest consumer of non-renewable natural gas, which is used for space heating and hot water heating. In British Columbia, electricity is considered a clean, renewable source of energy. Transitioning from natural gas space heating to electric space heating using high-efficiency heat pumps in Metro Vancouver Housing buildings is seen as one of the most promising opportunities for Metro Vancouver Housing to transition to renewable energy. Unfortunately, even when factoring in Metro Vancouver's internal carbon price of \$150 per tonne of carbon dioxide equivalent emissions, business cases completed to date have shown that it is not yet financially viable to invest in electric heat pump technology. Improved financial incentives from BC Hydro, the Provincial Government, and/or Federal Government could tip the business case to the positive in the future. In the meantime, Metro Vancouver Housing will continue to evaluate how heat pump technology could play a role in achieving the GHG emissions reduction targets set out in Housing's 10-Year Plan. Metro Vancouver Housing's focus over the next 10 years will be on new construction and major rehabilitation, and this presents a significant opportunity to shift towards electrification to align with the targets of carbon neutrality in the Climate 2050 plan. Higher capital and operating costs for electric systems compared to high-efficiency natural gas systems are expected to make this transition financially challenging.

With respect to transitioning to lower-carbon fleet vehicles, the impacts of changes to the Metro Vancouver Housing fleet are discussed in Section 4.5.

6. SUMMARY

From 2014 through 2018, Metro Vancouver Housing invested in energy-efficient equipment and a building envelope upgrade that have reduced its weather-adjusted energy use by over 10%, weather-adjusted energy costs by 2%, and weather-adjusted GHG emissions from energy use by 8%. In its 2019

Annual Work Plan, Metro Vancouver Housing became the first Metro Vancouver department to set GHG emissions reduction targets and has included GHG emissions reduction and energy efficiency improvement targets in its 10-Year Plan (2019). Metro Vancouver Housing has collaborated to develop decision processes based on options analyses that aim to identify asset investment opportunities with the lowest life cycle net present value while incorporating Metro Vancouver's carbon price. Transitioning Metro Vancouver Housing's space heating and domestic hot water heating systems from fossil natural gas to electricity will be instrumental for Metro Vancouver Housing to meet its GHG emissions reduction goals. High costs for capital, operation, and maintenance of these electrical solutions are expected to pose a financial challenge for Metro Vancouver Housing.

APPENDIX A SUPPLEMENTAL DATA

Metro Vancouver Housing Corporation
Annual Energy and Greenhouse Gas Emissions Management Report
2014 to 2018

Table A1: Summary of Departmental Trends

Metro Vancouver									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	1,442,301	1,442,212	1,486,436	1,498,215	1,494,862	-0.01%	3%	4%	4%
Total Cost (\$)	\$ 21,437,482	\$ 21,411,027	\$ 23,428,066	\$ 24,235,895	\$ 26,462,678	0%	9%	13%	23%
Total GHG Emissions (t CO ₂ e)	18,623	18,810	18,742	17,439	21,041	1%	0.6%	-6%	13%
Population	2,487,879	2,524,714	2,575,540	2,610,929	2,648,493	1%	4%	5%	6%
GJ/capita	0.580	0.571	0.577	0.574	0.564	-1%	-0.4%	-1%	-3%
\$/capita	\$ 8.62	\$ 8.48	\$ 9.10	\$ 9.28	\$ 9.99	-2%	6%	8%	16%
kg CO ₂ e/capita	7.5	7.5	7.3	6.7	7.9	-0.5%	-3%	-11%	6%
Liquid Waste Services									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	947,374	885,533	927,861	929,560	938,832	-7%	-2%	-2%	-1%
Total Cost (\$)	\$ 9,075,054	\$ 8,264,923	\$ 9,638,522	\$ 9,986,935	\$ 13,490,288	-9%	6%	10%	49%
Total GHG Emissions (t CO ₂ e)	5,736	5,770	5,471	4,835	8,320	1%	-5%	-16%	45%
ML Collected & Treated	440,763	415,000	437,520	449,541	456,083	-6%	-1%	2%	3%
GJ/ML Collected & Treated	2.15	2.13	2.12	2.07	2.06	-1%	-1%	-4%	-4%
\$/ML	\$ 20.59	\$ 19.92	\$ 22.03	\$ 22.22	\$ 29.58	-3%	7%	8%	44%
kg CO ₂ e/ML	13.0	13.9	12.5	10.8	18.2	7%	-4%	-17%	40%
Water Services									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	182,367	250,479	238,541	258,465	242,946	37%	31%	42%	33%
Total Cost (\$)	\$ 4,578,678	\$ 5,933,789	\$ 6,022,223	\$ 6,922,103	\$ 6,038,796	30%	32%	51%	32%
Total GHG Emissions (t CO ₂ e)	1,784	2,168	2,394	2,400	1,939	22%	34%	35%	9%
ML Treated & Delivered	381,261	385,093	383,774	389,177	399,736	1%	1%	2%	5%
GJ/ML Treated & Delivered	0.48	0.65	0.62	0.66	0.61	36%	30%	39%	27%
\$/ML	\$ 12.01	\$ 15.41	\$ 15.69	\$ 17.79	\$ 15.11	28%	31%	48%	26%
kg CO ₂ e/ML	4.7	5.6	6.2	6.2	4.9	20%	33%	32%	4%
Solid Waste Services									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	192,026	197,721	189,144	169,980	181,379	3%	-2%	-11%	-6%
Total Cost (\$)	\$ 5,246,106	\$ 5,035,676	\$ 5,058,848	\$ 4,294,082	\$ 3,988,835	-4%	-4%	-18%	-24%
Total GHG Emissions (t CO ₂ e)	7,023	7,277	6,652	5,636	6,525	4%	-5%	-20%	-7%
Mass Disposed (tonnes)	542,477	539,926	557,495	590,002	590,805	0%	3%	9%	9%
GJ/tonne disposed	0.35	0.37	0.34	0.29	0.31	3%	-4%	-19%	-13%
\$/tonne disposed	\$ 9.67	\$ 9.33	\$ 9.07	\$ 7.28	\$ 6.75	-4%	-6.17%	-25%	-30%
kg CO ₂ e/tonne disposed	12.9	13.5	11.9	9.6	11.0	4%	-8%	-26%	-15%
Housing									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	66,969	63,376	63,517	67,531	63,404	-5%	-5%	0.8%	-5%
Total Cost (\$)	\$ 1,133,904	\$ 1,038,603	\$ 1,055,580	\$ 1,182,707	\$ 1,170,949	-8%	-7%	4%	3.3%
Total GHG Emissions (t CO ₂ e)	2,362	2,245	2,243	2,424	2,272	-5%	-5%	3%	-4%
Million m ² *HDD	750	711	724	833	788	-5%	-3%	11%	5%
kJ/(m ² *HDD)	89.28	89.13	87.71	81.07	80.47	-0.2%	-2%	-9%	-10%
\$/million m ² *HDD	\$ 1,512	\$ 1,461	\$ 1,458	\$ 1,420	\$ 1,486	-3%	-4%	-6%	-2%
g CO ₂ e/(m ² *HDD)	3.15	3.16	3.10	2.91	2.88	0.3%	-2%	-8%	-8%
Corporate Services									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	36,556	29,765	54,460	61,552	54,846	-19%	49%	68%	50%
Total Cost (\$)	\$ 872,617	\$ 679,349	\$ 1,277,304	\$ 1,522,402	\$ 1,348,803	-22%	46%	74%	55%
Total GHG Emissions (t CO ₂ e)	954	664	1,464	1,789	1,460	-30%	54%	88%	53%
Population	2,487,879	2,524,714	2,575,540	2,610,929	2,648,493	1%	4%	5%	6%
GJ/capita	0.01	0.01	0.02	0.02	0.02	-20%	44%	60%	41%
\$/capita	\$ 0.35	\$ 0.27	\$ 0.50	\$ 0.58	\$ 0.51	-23%	41%	66%	45%
kg CO ₂ e/capita	0.4	0.3	0.6	0.7	0.6	-31%	48%	79%	44%
Parks									
	Year					Percent Change Relative to 2014			
	2014	2015	2016	2017	2018	2015	2016	2017	2018
Total Energy Use (GJ)	17,008	15,338	12,912	11,127	13,454	-10%	-24%	-35%	-21%
Total Cost (\$)	\$ 531,123	\$ 458,686	\$ 375,589	\$ 327,666	\$ 425,006	-14%	-29%	-38%	-20%
Total GHG Emissions (t CO ₂ e)	766	686	517	355	525	-10%	-32%	-54%	-31%
Population	2,487,879	2,524,714	2,575,540	2,610,929	2,648,493	1%	4%	5%	6%
MJ/capita	6.84	6.08	5.01	4.26	5.08	-11%	-27%	-38%	-26%
\$/capita	\$ 0.21	\$ 0.18	\$ 0.15	\$ 0.13	\$ 0.16	-15%	-32%	-41%	-25%
kg CO ₂ e/capita	0.31	0.27	0.20	0.14	0.20	-12%	-35%	-56%	-36%

Notes:

Improvement / Favourable (change less than zero)

Degradation / Unfavourable (change greater than zero)