ENVIRONMENT COMMITTEE

HIS WORSHIP, THE MAYOR
AND COUNCILLORS

SUBJECT: CITY ENERGY STRATEGY

RECOMMENDATION:

1. THAT Council approve the City Energy Strategy, as outlined in Section 4 of the report.

REPORT

The Environment Committee, at its meeting held on 2020 June 24, received and adopted the *attached* report seeking Council approval of the City's Energy Strategy. The Strategy supports the Climate Action Framework by providing a phased approach, action list, and decision criteria for future projects to facilitate the energy transition within corporate operations and achievement of corporate carbon neutrality by 2040 (ahead of the 2050 carbon neutral community target).

Respectfully submitted,

Councillor J. Keithley
Chair

Councillor C. Jordan
Vice Chair

Copied to:	City Manager Director Corporate Services Director Engineering Director Finance Director Parks, Recreation and Cultural Services Director Public Safety and Community Services City Solicitor

City of Burnaby

Item .....
Meeting .....June 24, 2020

COMMITTEE REPORT

TO:	CHAIR AND MEMBERS ENVIRONMENT COMMITTEE	**DATE:**	2020 June 12
FROM:	DIRECTOR CORPORATE SERVICES	FILE:	33000 02

SUBJECT: CITY ENERGY STRATEGY

PURPOSE: To seek Committee and Council approval of the City's Energy Strategy.

RECOMMENDATION:

1. **THAT** the Committee recommend Council to approve the City Energy Strategy as outlined in Section 4 of this report.

REPORT

1.0 INTRODUCTION

Burnaby City Council declared a Climate Emergency on September 9, 2019, committing the community as a whole to an energy transition away from fossil fuels. At the same time, Council adopted updated community-wide carbon reduction targets: a 45% carbon emission reduction by 2030, a 75% reduction by 2040, and carbon neutral by or before 2050. Staff were directed to provide Council with a Climate Action Framework detailing action to meet the targets.

In support of the Climate Action Framework, and to demonstrate leadership on the climate file, the City is also advancing a City Energy Strategy. The purpose is to guide the energy transition in corporate operations through a corporate commitment to climate action, with a feasible and implementable Strategy that commits the City of Burnaby to meet the carbon neutral climate target across corporate operations by 2040. The Strategy includes a vision for the City's energy system; principles and decision-criteria to guide energy decisions going forward; a commitment to a carbon neutral target date for City operations; and, four Big Moves with associated actions to set the transition pathway.

The City Energy Strategy was developed by a cross-departmental staff team through a series of meetings focused on vision, principles, decision-criteria, targets and actions. Additional staff meetings developed the Green Fleet and Green Equipment actions in more detail. Larger staff workshops on Facilities and Fleet also provided input into the Strategy, to ensure feasibility and pro-active implementation.

Through implementation of the City Energy Strategy, Burnaby will adopt practices and technologies that highlight the energy transition within corporate operations, enabling Burnaby to achieve corporate carbon neutrality ahead of the community target.

2.0 POLICY SECTION

The City Energy Strategy is aligned with the City of Burnaby's Corporate Strategic Plan by supporting the following goals and sub-goals of the Plan:

Goal

- A Connected Community
  - Partnership – Work collaboratively with businesses, educational institutions, associations, other communities and governments.

- A Healthy Community
  - Healthy environment – Enhance our environmental health, resilience and sustainability.

- A Dynamic Community
  - City facilities and infrastructure – Build and maintain infrastructure that meets the needs of our growing community.

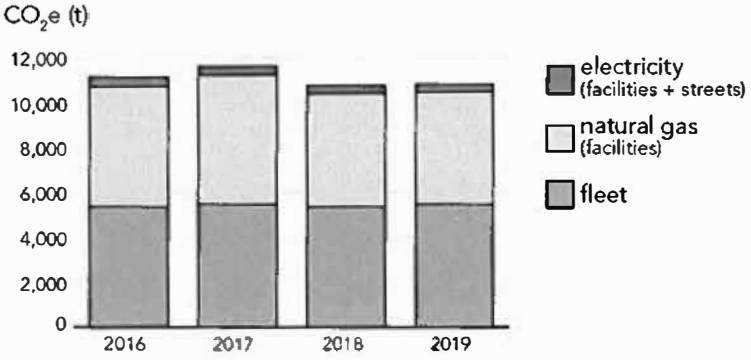
- A Thriving Organization
  - Financial viability – Maintain a financially sustainable City for the provision, renewal and enhancement of City services, facilities and assets.
  - Technology and innovation – Support technology development and innovation to empower staff and to advance community objectives.

3.0 BURNABY'S ENERGY USE AND CARBON EMISSIONS

Burnaby began reporting on corporate emissions to the province for the 2016 year. Corporate emissions, not including offsets from organic waste diversion, have remained relatively stable from 2016 through 2019, at fewer than 12,000 tonnes annually.

Burnaby's corporate emissions are split relatively evenly between Fleet and Facilities natural gas, as shown below. Grid electricity used in buildings and lighting (street and traffic lights) accounts for only a small percentage of the emissions, owing to BC's low-carbon electrical supply.

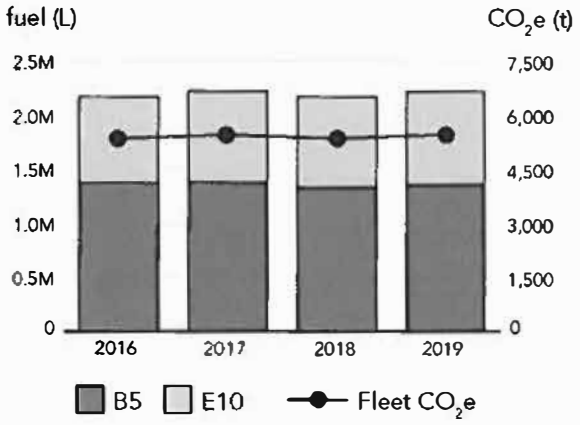
Corporate Emissions (2016-2019)



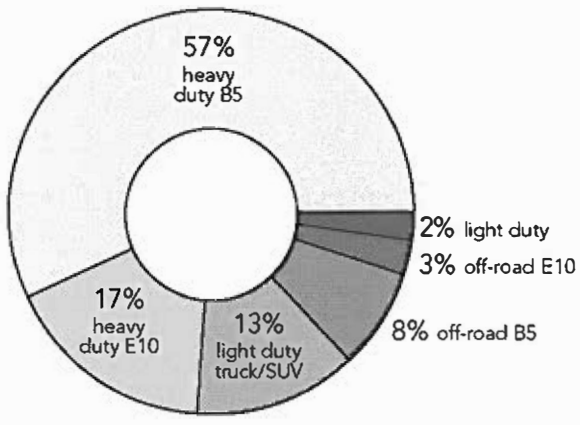
3.1 Fleet

In fleet, the City began using 10% ethanol (gasoline mix) and 5% biodiesel in 2010, which was more than the mandated BC Low Carbon Fuel Standard of 5% ethanol and 4% biodiesel at the time. Fleet also moved to purchase energy efficient vehicles where appropriate, particularly light-duty cars and trucks. A new Fuel Management System, in place as of 2016, and improved vehicle telematics, have enabled improved fuel and vehicle performance tracking. Some equipment, such as mowers at the golf courses, has been transitioned to electric, although the majority of Parks and Engineering equipment currently uses diesel or gas to operate.

Fleet Fuel Use and Emissions (2016-2019)



Fleet Emissions by Source (2019)



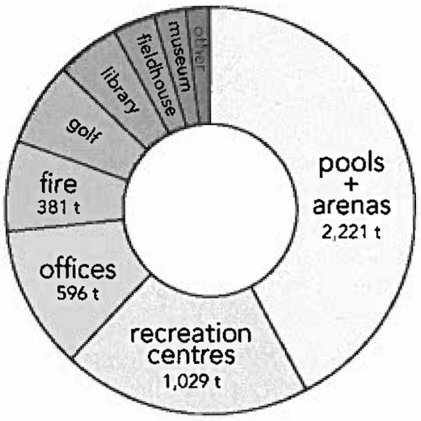
Between 2016 and 2019, Fleet fuel use and carbon emission has remained relatively constant. The majority of Fleet emissions come from heavy-duty diesel vehicles, such as those used in solid waste and recycling collection. Heavy-duty and light-duty E10 gasoline trucks comprise the next largest emissions source, while off-road vehicles and equipment,

both gas and diesel, comprise just over 10%. Light-duty vehicles, such as passenger cars, produce the fewest Fleet emissions.

3.2 Facilities

The City of Burnaby has 54 major sites and over 100 minor sites, with several new and replacement projects in planning, design or construction. Currently, more than 80 natural gas accounts provide space and hot water heating at city facilities, as well as some auxiliary uses such as cooking. Pools, arenas and recreation centres in general produce the most emissions, followed by the offices and the golf courses. Fewer than 20 buildings are "heavy" natural gas users, responsible for more than 65% of total facility carbon emission.

Facility Emissions by Source (2019)



The City has previously undertaken considerable work on building energy optimization, beginning in 2004-2006 with retrofits to 49 facilities. This early work resulted in a verified reduction of more than 1200 tCO2e annually.[1] On-going building optimization has continued to provide energy efficiency and GHG reductions through the BC Hydro Strategic Energy Management Planning program (SEMP), in place since 2010, which focuses on energy conservation and cost savings for both electricity and natural gas. Through this program, facilities continue to transition to more efficient heating, hot water and lighting systems.

Recently, the focus has been the transition to LED lights: in 2017-2018, LED conversions in 10 facilities led to estimated electrical savings of more than 700,000 kWh annually. LED conversions at 19 facilities in 2019 resulted in savings of more than 750,000 kWh. Additionally, high-efficiency boiler replacements have reduced natural gas usage and associated GHG emissions. Building recommissioning has also reduced energy use and carbon emission, such as at Edmonds Community Centre, where the 2018 recommissioning program reduced natural gas and electrical use by 32% and 5% respectively.[2] Annual carbon emission reductions from these retrofits are smaller than the initial "big lift" following the 2004-2006 program, due in part to the small carbon emission reductions achieved through electrical energy efficiency (BC's grid electricity is already low-carbon), and diminishing returns on investment once "big reductions" have been achieved. Fuel switching from natural gas to electricity, and, in the future, to a limited

[1] "Year Six Period Energy and Operation Savings Report." Submitted by Honeywell to the City of Burnaby, November 2012. Measurement & verification was undertaken at 33 of the most energy intensive buildings, with total savings of $3,265,040 and 7,842 tonnes CO2e over 6 years of measurement and verification. Key retrofits included: improved lighting systems; pool covers; building weather stripping and sealing; power factor correction; boiler replacements; sensors and flush controls to reduce water consumption; low-e ceilings; and building automation.

[2] As compared to 2017; data from the City of Burnaby, Strategic Energy Management Plan 2019.

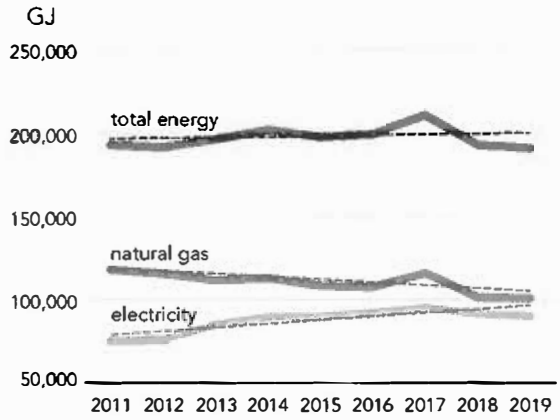
supply of renewable natural gas, will be required to achieve carbon neutrality in existing facilities.

3.2.1 New Facilities – Energy Efficiency and Renewable Energy

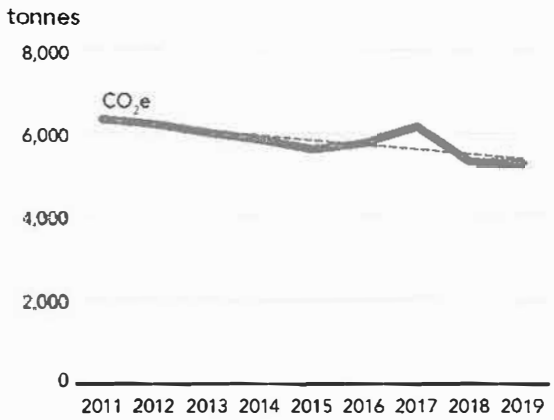
New civic facilities built over the past 15 years have incorporated energy efficiency and renewable energy systems. For example, the Tommy Douglas Library, built in 2009, makes use of geothermal (ground-source) heating, eliminating the need for natural gas while providing adequate heating throughout the library. In 2013, the Bonsor pool was retrofitted with solar thermal (hot water) heating.

Reducing natural gas demand at facilities has enabled the addition of new facilities, such as the Edmonds Recreation Centre in 2013, without increasing carbon emission. In fact, carbon emissions in Burnaby's facilities trend downwards 2011-2019 due to efficiency upgrades, increased electrification and a decrease in natural gas usage, even as the City brought new facilities online. Electricity use and total energy consumption increased marginally over the same time period, levelling off or declining in the past two years.

Facility Energy Consumption (2011-2019)



Facility Carbon Pollution (2011-2019)



The current downward trend line in facility emissions is unlikely to reach the City's climate emergency target of carbon neutral, particularly as the much of the "low-hanging" fruit has already been completed, and several new facilities are due to come online over the next decade. Continued building optimization as well as heating and hot water system electrification in existing facilities will be required through 2040 to meet the City's carbon neutral commitment. New facilities that are not zero emissions in their operations will add to the on-going transition challenge, or add demand for limited renewable natural gas.

3.3 LED Street Light Project

In 2019, the City of Burnaby completed conversion of all streetlights to LED, becoming the first municipality in Metro Vancouver to do so. The conversion of 11,600 streetlights reduces energy consumption by approximately 60 percent and saves the City

approximately $750,000 a year in energy costs. The move is also expected to save $900,000 in maintenance costs over 20 years. Conversion of the streetlights cost $4.8M, which will be recovered in six years. In terms of climate, reducing electrical use results in small GHG savings due to BC's low-carbon hydro-electricity; however, the LED conversion demonstrates leadership and fiscal responsibility, and makes the electricity available for other uses.

4.0 CITY ENERGY STRATEGY

4.1 Vision, Principles and Decision Criteria

Vision

Burnaby's corporate energy system is carbon neutral, resilient, equitable and future looking, supporting a healthy, green, livable and prosperous community.

Principles

Guiding principles define core values, supporting and steering City decisions related to energy and carbon emission: *"Our core values describe how we do our work. They are the principles that guide our actions and decisions"* (Corporate Strategic Plan, 2017).

City Energy Strategy Guiding Principles[3]
1) **Climate Action** We recognize the urgent need to transition to renewable, low-carbon energy across all City operations, achieving carbon neutrality by or before 2040.
2) **Responsibility** We make decisions that foster the long-term resilience of our community and environment, and recognize our responsibility for the well-being of future generations.
3) **Leadership** We adopt leading approaches and best practices, and foster new approaches in energy conservation and efficiency, and greenhouse gas reduction, setting an example for private development.
4) **Holistic Valuation** We seek energy and climate solutions that provide long-term benefits (monetary and non-monetary), create synergies with environmental, social and economic sustainability, and explicitly consider lifecycle costs.

[3] Based on principles expressed in the following City documents: State of the Environment Report (1993), Official Community Plan (1998/2010/2014), Social Sustainability Strategy (in OCP), Economic Development Strategy (2007), Environmental Sustainability Strategy (2016), Community Energy & Emissions Plan (2016), Climate Action Charter (2017), Corporate Strategic Plan (2017), Transportation Plan Update: Phase 1, Vision and Principles (2018), Climate Emergency Environment Committee Report (2019).

5) **Fairness & equity** We ensure that energy and climate policies, programs and infrastructure are fair and equitable.
6) **Proactive energy transition** We proactively manage energy resources so as to anticipate and adapt to changes in climate, society, the economy and technology.
7) **Collaboration** We work collaboratively with others, including other governments, businesses and community groups, to advance our shared energy and climate goals and priorities.

Decision-Criteria Guidance

New projects and actions may arise in the future in support of the City's energy transition. The following decision criteria ensure that key requirements are met, to help achieve the City's carbon neutral target in a fiscally prudent and efficient manner.

REQUIREMENTS	Meet an operational need;
	Eliminate carbon pollution in City operations;
	Supporting infrastructure is in place or budgeted for.
CONSIDERATIONS	Potential to increase system efficiency (e.g. geothermal);
	Future operational costs, potential to recover capital costs;
	Funding & partnership opportunities;
	Increased resilience to climate impacts;
	Impacts on equity & inclusion.

4.2 Target: Carbon Neutral by 2040 in Corporate Operations

The City of Burnaby recognized the importance of taking action on climate in its 1993 State of the Environment report, and acknowledged climate change and climate action in the 1998 OCP. Since that time, work has been undertaken to improve energy efficiency in facilities, add renewables, and reduce emissions in the fleet. Burnaby also completed an Environmental Sustainability Strategy in 2016. Over the same time period, the need to reduce carbon emissions has become more urgent, an urgency recognized by Council in declaring a Climate Emergency in 2019.

The City's community carbon emission target aims to complete the transition to a carbon neutral community by 2050. **For corporate operations, the target is to achieve carbon neutral corporate operations one decade earlier, by 2040.** This will be challenging to

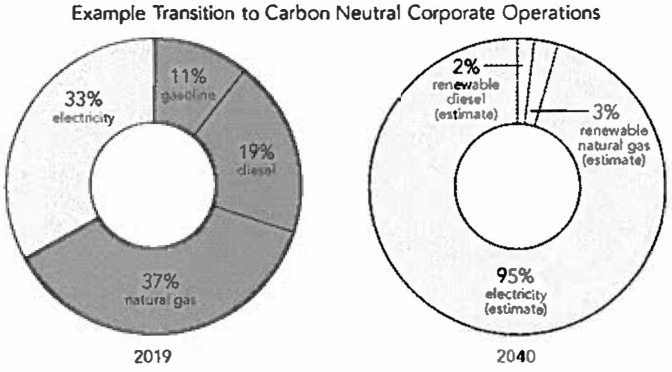
achieve, particularly for existing facilities. However, through changes in demand, system and energy efficiency, the adoption of new practices and technologies, and fuel switching, the City should be able to achieve carbon neutrality, and demonstrate the feasibility of the energy transition.

4.3 Challenges and Opportunities

As noted above, meeting the 2040 carbon neutral target comes with challenges, one of which is that early work on energy efficiency has already been undertaken. Fuel switching will be necessary to meet the transition challenge – this, along with additional challenges and opportunities within Fleet and Facilities, are outlined below.

4.3.1 The Need for Fuel Switching - Electrification

Due to its early and on-going action on energy efficiency, Burnaby now faces a dual challenge in reducing overall corporate emissions: diminishing returns on energy efficiency investments as well as a growing population and concomitant growth in service needs. Reducing overall corporate emissions in the face of this dual challenge will require fuel switching away from natural gas, gasoline and diesel to renewable fuels, primarily BC's hydro-electricity. In some cases, renewable fuels that directly replace existing energy supply, such as renewable natural gas (RNG) and renewable diesel (RD), may also be used. For both of these, future supply is likely to be limited and therefore costly.[4] Burnaby's future energy supply is therefore anticipated to primarily utilize electricity, with some renewable diesel and renewable natural gas, as shown in the example below.



The transition to carbon neutral corporate operations will rely mainly on fuel switching to low-carbon grid electricity.

4.3.2 Transition Challenges

Several challenges must be considered as the City advances energy efficiency and the transition to carbon neutral operations.

[4] Renewable energy supply also includes available thermal energy (air and ground/geo-exchange) and waste heat energy, made possible by heat pump technology (i.e. electricity); solar thermal, which provides hot water; solar photovoltaics (PV) which can provide a resilient supply of electricity into or in addition to the grid; and, other future fuels that will depend on infrastructure, technology and supply, such as hydrogen for transportation and biomass for heating. Given supply and technology constraints on future fuels, electrification is the key strategy for both Facilities and Fleet at this time.

Facilities

1. Emissions from existing facilities must decline faster than they have historically to meet the target. Retrofits, including envelope, heating and hot water retrofits in some facilities, may be costly because the investments with a positive return have already been undertaken. Many of the highest-polluting facilities are challenging to retrofit to electricity, particularly existing recreation centres with swimming pools. However, electric technology is advancing for these high-intensity uses and there may be opportunities to replace aging equipment with electric equivalents; other facilities may need to be retrofit ahead of replacement schedules, or prioritized for a limited renewable natural gas supply. Further work is required to prioritize and phase the needed retrofit work.

2. New facilities projects are being undertaken, with several projects currently in preliminary concept design, feasibility, detailed design or construction. Those that are not zero emissions at the time of construction will add to Burnaby's corporate emissions and the retrofit challenge, unless a transition plan or renewable fuel alternative has been planned for.

3. Some new civic facilities, such as ice rinks and swimming pools, are not currently covered by higher steps in the BC Energy Step Code and, in addition, achieving zero emissions in operations may be challenging and potentially costly. Some of these facilities may need to make use of the limited supply of renewable natural gas. Such decisions should be made strategically, in the context of all of Burnaby's facilities.

4. Some new systems may provide a different user experience, such as slower space heating changes, than what some users are accustomed to. Communications around the system changes will help with the transition to zero emissions buildings.

Fleet and Equipment

5. Administration of Burnaby's vehicle and equipment assets is currently split between six administrative units. Centralizing Fleet and Equipment administrative processes, such as procurement and vehicle standardization, will make the green fleet transition more efficient and cost effective.

4.3.3 Transition Opportunities

Given that Burnaby's population increased in the period 2011-2019 while the corporate emissions trend has been relatively constant, or, in the case of facilities, showed a downward trend, Burnaby is well-placed to demonstrate corporate leadership on emissions reductions and the transition to a carbon neutral local government. The transition will be aided by:

1. The availability in BC of low-cost, low-carbon grid electricity.

2. Partnerships and funding are available: other levels of government have strong climate commitments, with current and future funding available for Building and Fleet transition projects.

Facilities

3. Existing facilities are well managed through both the BC Hydro Strategic Energy Management Program, and a recent Asset Management Plan. Burnaby is thus well-placed to strategically review and update the AMP to include carbon-based asset management, taking advantage of component lifecycles and replacement schedules to upgrade to zero carbon systems through end-of-life replacement.

4. New facilities are being planned and designed for the City, which is the most cost effective time to design for zero emissions and energy efficiency, and to include electric vehicle charging infrastructure.

Fleet and Equipment

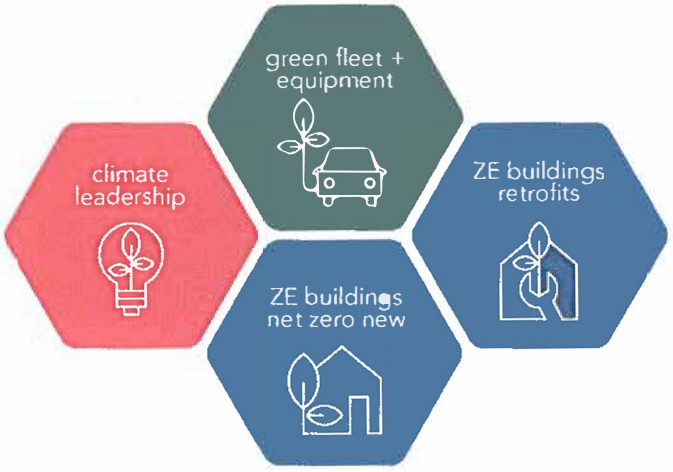
5. Vehicle and equipment turn-over rates mean that there are two or more replacement cycles between 2020 and 2040. This will allow for a rapid transition to electric vehicles and equipment where current substitutes exist, while holding off on those assets currently lacking technology solutions and/or with high capital premiums. Two-thirds of the Fleet have a positive business case for EV replacement at the time that technology becomes available, taking into account the internal carbon price; the remaining third should see cost premiums decline before they are scheduled for EV replacement. The EV transition can therefore be strategically planned to take advantage of cost premium reductions, while achieving the target of a carbon neutral fleet by 2040.

4.4 Corporate Action Plan: Big Moves and Associated Actions

4.4.1 Overview

The City Energy Strategy aligns with the Community Climate Action Framework, using four of the seven community Big Moves to enable the corporate energy transition: Climate Leadership, Zero Emission Vehicles (Green Fleet and Equipment), Zero Emission Buildings – Net Zero New, and Zero Emission Buildings – Retrofits.

Climate Leadership will prepare the City for the energy transition, with enhanced administrative capacity and systems including a centralized Energy Transition team.



Carbon pricing and emissions reporting will become standard to capital and operating budget reporting; staff engagement will build corporate commitment to the energy transition; and, renewable energy demonstration projects can make Burnaby's commitment visible to the community while providing local energy supply.

Green Fleet and Equipment, or the transition to zero-emission mobile assets, will be driven administratively through centralized administration in Corporate Services. Early emissions reductions from light-duty cars, light-duty trucks and equipment will be followed by larger reductions occurring later as heavy-duty vehicles are replaced with electric alternatives. It is anticipated that electric vehicles will be phased in through the vehicle replacement schedule out to 2039. Key to the transition is ensuring adequate charging infrastructure at major and secondary sites. Some critical asset vehicles, such as those used for emergency response, may remain as liquid fuel vehicles, making use of a limited supply of renewable diesel or other emerging options. Driver education and efficient Fleet administration through a centralized administrative role will support the Green Fleet transition.

Zero Emission Buildings, Net Zero New, commits the City of Burnaby to plan and design for high energy efficiency and zero carbon facilities, making use of low-carbon grid electricity or other renewables. Net Zero may be met on a project-by-project basis by a combination of energy efficiency, grid electricity, and other renewables, depending on project needs. Zero carbon will be prioritized over very high energy efficiency, if necessary. Renewable natural gas will be used only where technology constraints exist for electrification. New facilities that are not zero emissions in operations (heating, cooling and hot water) will require a transition plan to electrification or a limited supply of renewable natural gas prior to 2040. Embodied emissions will be accounted for and reduced through design and material selection.

Zero Emission Buildings, Retrofits, commits the City of Burnaby to meet the 2040 carbon neutral target by accelerating energy efficiency and energy transition work at existing facilities, through prioritization of key carbon elimination projects, such as the conversion of natural gas boilers to heat pumps, and identification of future demands for the limited renewable natural gas supply.

4.4.2 City Energy Strategy Actions

The following table outlines the key action commitments to energy efficiency and the carbon neutral transition within corporate operations.

Climate Leadership

Strengthen City Leadership, administrative capacity, and staff engagement on climate and energy.

1. STRENGTHEN CLIMATE ACTION ADMINISTRATION

QUICK START: Establish a centralized Energy Transition Team, including centralized Green Fleet and Equipment administration; expand corporate reporting procedures.

QUICK START: Implement an internal carbon price, with procedures and processes to help make operational and financial decisions across the City. Note that a Climate Reserve Fund was established in Q1 2020.

QUICK START: Integrate reporting on energy, climate and GHGs in reports to Council and Committees (e.g. capital and operational budgets).

FUTURE: Energy and carbon emission impacts will be included in future Asset Management Plans (AMPs), where applicable.

2. SUPPORT CLIMATE LEADERSHIP PROJECTS. The City currently has three projects undergoing feasibility studies to assess impact and cost: City Hall solar PV, the Burnaby and Metro Vancouver Waste-to-Energy District Energy study, and the proposed Burnaby organics to biogas facility.

ON-GOING: Burnaby will continue to bring forward, review and support renewable energy projects that meet the City Energy Strategy's principles and decision criteria, with a focus on those that reduce emissions, increase resilience, and meet operational requirements.

3. PROVIDE WORKPLACE EV CHARGING at City facilities for staff, to demonstrate leadership on the energy transition.

ON-GOING: Charging infrastructure will be added to existing facilities based on available electric infrastructure, and included in the design of new facilities. Fees for charging will be applied. Where possible, staff charging facilities will double as public charging during non-staff hours.

4. ACCELERATE VIRTUAL TECHNOLOGY DEVELOPMENT & INNOVATION to reduce transportation trips within Burnaby.

ON-GOING: This action commits the City to accelerate commitments to technology improvements and innovation so as to reduce staff trips (e.g. virtual meetings across facilities), as well as continuing to enhance the provision of online services for Burnaby residents and businesses, to reduce driving trips to City Hall and other facilities.

5. ENGAGE STAFF IN CLIMATE COMMITMENTS. Burnaby's Green Team produces annual environmental challenges for staff, such as Wake-On-LAN, Working by Daylight, Vacation Ready Checklist, Enhanced Employee Transit Incentive Program, Bike to Work Week,

Commuter Challenge, Stair Riser Campaign, Throwback Sweater Day, and The Chilling Truth About Winter Idling.

ON-GOING: This action commits the City to continue and enhance its staff engagement across Departments, building staff commitment to take action on the climate emergency.

Zero-Emission Vehicles: Green Fleet & Equipment

Transition to an efficient, carbon neutral Fleet before 2040.

1. UPGRADE FUELLING INFRASTRUCTURE. Prior to transitioning to electric vehicles, the City of Burnaby must invest in electrical infrastructure at major and secondary sites. Upgrades include additional electrical service and transformers, conduit and cabling, and Level 2 and fast-charging equipment. Three primary facilities – City Hall Compound, Still Creek Yard and Laurel Street Yard will require the majority of the upgrades, with some secondary sites as well, based on the following priority:

QUICK START: Electrify City Hall compound. Capacity: 100 light-duty Fleet vehicles, served by Level 2 charging. Cost: $500,000 matched by Federal funding. Completion: 2021.

QUICK START: Ensure adequate electrical infrastructure in new Laurel St. Works Yard. Capacity: 195 light, medium and heavy-duty vehicles, served by a mix of Level 2 and fast-charge stations. Completion: 2023.

QUICK START: Plan for infrastructure upgrades at secondary Parks facilities, including Riverway and Burnaby Mountain golf courses, to transition equipment and vehicles. Completion of infrastructure planning work: 2020-2021. Phased infrastructure installation at secondary locations to start in 2021.

FUTURE: Plan for electrical infrastructure upgrade at Still Creek Works Yard. Capacity: 195 light, medium and heavy-duty vehicles. Phased infrastructure installation to be completed by 2026.

FUTURE: Plan for infrastructure upgrades at Fire Department locations, to support the transition of suitable equipment and vehicles.

2. TRANSITION VEHICLES & EQUIPMENT. The transition to electric vehicles and equipment will occur gradually through the regular vehicle replacement schedule, as new electric vehicles come to market and the price premium compared to traditional fuel vehicles reduces. Based on anticipated release dates of vehicles, current market trends and charging infrastructure availability, the transition to electric vehicles will begin with light duty passenger vehicles and some equipment in 2020, with light-duty pick-up trucks in 2023, and heavy duty vehicles and heavy equipment in 2024.

QUICK START: Replace light-duty vehicles with EV through scheduled replacement, 2020-2030.

QUICK START: Replace equipment with electric alternative as available and through scheduled replacement, 2020-2030.

FUTURE: Replace heavy-duty, specialty vehicles and heavy-duty equipment as they become available and as scheduled for replacement, 2024-2039.

3. EVALUATE CRITICAL ASSETS for renewable liquid fuels.

FUTURE: Identify critical assets, such as specific Emergency Response vehicles, that will require the adoption of equivalent, renewable alternatives (i.e. renewable diesel hybrids) rather than electric vehicles. Timeline for critical asset list: 2024.

Renewable fuel conversion timeline: Due to limited supply and increasing demand, prices for renewable diesel have risen. The City is targeting to adopt a locally produced supply of renewable diesel by 2027 to reduce costs and supply chain concerns.

4. EFFICIENTLY ADMINISTER & OPERATE Burnaby's Fleet.

QUICK START: Centralize Fleet administration within Corporate Services to efficiently administer the Green Fleet and Equipment transition. The Green Fleet and Equipment Manager will work with Departmental Fleet Coordinators on strategic and best cost procurement and efficient disposal processes of fleet vehicles and equipment, to support an effective Green Fleet transition. Existing investments in fleet technology to optimize fleet use, maintenance, and composition will be leveraged. Effective: 2020.

QUICK START: Use financial tools to support the Green Fleet transition, such as leveraging third party grant programs for associated capital costs and changes to charge-out rates (such as fossil fuel premiums). Capital requests to include internal carbon price in procurement reports.

ON-GOING: Continue driver/operator education and culture change, such as targeted anti-idling campaigns and other initiatives. Some driving behaviour, such as prolonged idling, excessive speeding and forceful driving that can increase fuel consumption without a commensurate increase in productivity. Education and culture change, along with vehicle telematics, could reduce vehicle carbon emission by approximately 5%.

ON-GOING: Continue to engage staff in fleet improvement processes, including an annual cross-departmental Fleet workshop.

ZE Buildings – Net Zero New

Embed zero emissions into new facilities and corporate construction projects.

1. ADVANCE ZERO EMISSION new buildings as the default option for new or replacement civic facilities.

QUICK START: Require zero-emissions as the default option for new projects in preliminary and feasibility phases of facility planning and design based on industry standards for zero carbon or net zero operational emissions.

Burnaby's Civic Building Projects team currently requires proponents to make use of a Sustainability Checklist that includes high energy efficiency and very low-carbon options; this Quick Action would enable Council to evaluate zero-carbon options, including life-cycle costs and projected operational costs. If applicable, projected operational emissions due to technology constraints for full electrification or other renewables would require a zero emission transition plan or a future estimate of renewable natural gas demand.

QUICK START: Review projects currently in detailed design, tendering and construction, and provide a transition plan for one of: net-zero energy ready, future upgrade to zero carbon, or zero carbon in operations, with capital and operational costs as well as emissions projections. This should be coordinated with the Retrofit Big Move and an analysis of future RNG requirements across facilities.

FUTURE: Review and implement embodied emissions requirements for new facilities.

2. DEVELOP SUSTAINABLE FINANCE STRATEGIES to support zero emissions capital projects.

QUICK START: Evaluate projects against carbon targets, using the internal carbon price and projected lifecycle costs.

QUICK START: Plan for construction of net-zero energy ready or zero carbon new facilities in the Financial Plan. Provide estimated life-cycle capital costs to Council for project evaluation and review during the planning and funding processes.

QUICK START: Leverage CleanBC Commercial New Construction Program funding, which offers energy study and capital implementation funding based on the magnitude of GHG emissions reductions.

3. MINIMIZE FUTURE DEMAND for Renewable Natural Gas, as the future supply is limited.

QUICK START: Include retrofit/transition plans for new buildings that are not zero emissions at construction, including the estimated need for RNG. Provide future RNG demand estimates in reports to Council for approval, and to the Energy Transition Team.

FUTURE: As noted in Climate Leadership, local renewable energy projects will be considered as part of the City Energy Strategy. Renewable natural gas projects, or biogas, could supply some RNG to prioritized civic facilities.

ZE Buildings – Existing Facilities

Strategically plan for and rapidly advance the transition to zero emissions in existing buildings.

1. CONTINUE STRATEGIC ENERGY MANAGEMENT in existing facilities to ensure that energy use and emissions is tracked and reported on annually.

QUICK START: Benchmark key civic buildings, through the Building Benchmark BC program. In addition to tracking building energy use, benchmarking allows for comparison across similar buildings, improved energy management and consideration of potential GHG reductions. By participating in voluntary benchmarking and disclosure, the City is demonstrating best practice in building energy management.

QUICK START: Communicate facility carbon improvements through annual Energy Transition reporting, as well key changes at individual facilities and sites. Communications can help users to understand that low-carbon building systems may, in some cases, operate differently than older systems, and help to demonstrate best practices in the transition to a carbon neutral city.

2. DEVELOP AND IMPLEMENT an Electrification Strategy that considers all current natural gas systems, with the aim of strategically retiring and replacing fossil fuel equipment and systems through 2040.The City's Strategic Energy Management Plan (SEMP), co-funded by BC Hydro, is currently incorporating electrification and a 50% carbon reduction target by 2030.

QUICK START: Complete a city-wide Facilities Low Carbon Transition Plan Feasibility Study to identify GHG emissions reduction opportunities, limitations, associated costs, and first priorities.

QUICK START: Update the current Facilities Maintenance Management Plan to include a carbon emission reduction component, with the aim of meeting the corporate 2040 carbon neutral target. In support of this, the Low Carbon Maintenance Management Plan will identify retirement opportunities, life cycle renewals, and early renewals for existing equipment and facilities out to 2040, including identification of difficult-to-transition assets and associated future renewable natural gas demand. Burnaby's internal carbon price should be included in project assessments.

QUICK START: Include facility electrification priorities in the 2021-2025 capital budget.

3. WORK WITH PARTNERS on zero emissions retrofits.

QUICK START: Leverage CleanBC Custom Program funding for life cycle renewal projects. CleanBC funding opportunities are administered through BC Hydro, with energy study and capital implementation funding based on the expected magnitude of GHG emissions reductions.

4. PRIORITIZE FUTURE DEMAND for Renewable Natural Gas.

As future RNG supply will be limited, RNG should be reserved for hard-to-retrofit facilities. The estimated future demand on RNG from existing facilities should be identified in the electrification strategy and Low-Carbon AMP.

5.0 FINANCIAL IMPLICATIONS

Taking corporate action to address the climate emergency has financial implications for the City, both in operating expenses and capital budgets. In many cases, additional initial capital costs can be repaid over time through operational savings; however, additional costs are anticipated for some assets. The current five-year capital budget accounts for some transition costs, such as electrification of the City Hall compound. Grant and partnership funding is being actively pursued for this and other projects.

As noted in the Climate Action Framework, it is anticipated that new staff will be required, including for the centralized and multi-disciplinary Energy Transition Team. Additional information on financial implications will be brought forward in individual reports and through the budgeting process.

6.0 CONCLUSION

Burnaby's City Council demonstrated leadership in declaring a Climate Emergency and setting a 2050 carbon neutral community target. The City Energy Strategy builds on that leadership, with a 2040 carbon neutral target. The Strategy provides a framework, a phased approach, an action list, and decision criteria for future projects to support Burnaby staff and the Energy Transition Team in their on-going work to transition corporate operations.

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Director Finance
Director Parks, Recreation & Cultural Services
Director Public Safety and Community Services
City Solicitor
City Clerk