

City of Maple Ridge

SPECIAL COUNCIL WORKSHOP AGENDA

October 20, 2020

11:00 a.m.

Virtual Online Meeting including Council Chambers

The purpose of the Council Workshop is to review and discuss policies and other items of interest to Council. Although resolutions may be passed at this meeting, the intent is to make a consensus decision to send an item to Council for debate and vote or refer the item back to staff for more information or clarification. The meeting is live streamed and recorded by the City of Maple Ridge.

1. APPROVAL OF THE AGENDA

2. UNFINISHED AND NEW BUSINESS

2.1 Community Energy and Emissions Scoping Reports

Staff report dated October 20, 2020 recommending development of a Official Community Plan amending bylaw for public consultation to update Policy No. 5.45 for greenhouse gas emission targets, that a proposed Community Development and Enterprise Services Advisory Committee, once established, review feedback and provide recommendations; that staff review Official Community Plan sections 5.5 – Air Quality and 5.6 – Planning for Climate for policy alignment and provide recommendations to the proposed Committee prior to consideration by Council; and that the proposed Committee consider options for reducing greenhouse gas emissions outlined in sections 3.2 and 3.3. of the October 20, 2020 staff report.

3. ADJOURNMENT

APPROVED BY:

DATE:

PREPARED BY

DATE:

CHECKED BY:

DATE:

City of Maple Ridge



TO: His Worship Mayor Michael Morden
and Members of Council

MEETING DATE: October 20, 2020
FILE NO: 01-0690-02-2020

FROM: Chief Administrative Officer

MEETING: Council Workshop

SUBJECT: Community Energy and Emissions Scoping Report

EXECUTIVE SUMMARY:

The City of Maple Ridge's 2008 Sustainability Action Plan has for the most part been implemented. On May 26, 2020, Council directed staff to bring back information on the City's community greenhouse gas (GHG) emissions, reduction targets and actions to support a discussion on the targets and the City's progress toward achieving them. On July 7, 2020, the Committee of the Whole received a presentation illustrating that although *corporate* emissions were on track to meet reduction targets, *community* emissions were increasing along with the City's growing population. On July 14, 2020, Council directed that staff bring back a scoping report outlining options for reducing community greenhouse gas emissions and adapting to climate change.

The aim of this report is to highlight policies and actions being undertaken in other municipalities to reduce greenhouse gas emissions, and to seek Council direction on options for further exploration and implementation within the City of Maple Ridge.

RECOMMENDATION:

That staff be directed to bring forward an Official Community Plan amending bylaw for public consultation to update Policy No. 5.45 for greenhouse gas emission targets to net zero by 2050 from 2010 levels, with an interim target of 45% reduction by 2030, in alignment with the International Panel on Climate Change and that a proposed Community Development and Enterprise Services Advisory Committee, once established, review feedback and provide recommendations; and

That staff review Official Community Plan sections 5.5-Air Quality and 5.6-Planning for Climate for policy alignment and provide recommendations to the proposed Committee prior to consideration by Council; and further

That the proposed Committee consider the options for reducing greenhouse gas emissions outlined in sections 3.2 and 3.3 of the October 20, 2020 report titled *Community Energy and Emissions Scoping Report*, and provide recommendations to Council.

DISCUSSION:

1 Introduction

Climate action has been growing as a significant policy area for BC local governments since 2007 when the Province passed legislation requiring greenhouse gas emission reduction targets in local Official Community Plans and Regional Growth Strategies, along with supporting policies and actions.

In 2008, Council adopted a Sustainability Action Plan to identify both corporate and community actions that would be implemented or explored over the coming years. A review of the Sustainability Action Plan and greenhouse gas emissions, provided to Committee of the Whole on July 7, 2020, showed that the plan had been implemented, apart from developing a Community Energy and Emissions Plan. The review also conveyed that, although the City has undertaken numerous actions to mitigate greenhouse gas emissions, the City's growing population continues to push the aggregate figure upward. Council directed that staff bring back options for reducing emissions and adapting to climate change.

The City of Maple Ridge cannot achieve deep greenhouse gas reduction targets alone. Supporting legislation, similar in construct to the BC Energy Step Code for new buildings, is under development at the Provincial level for energy retrofits of existing buildings, and is necessary to enable the City to develop policies to unlock the significant emission reduction potential in our existing building stock. The BC Zero Emission Vehicle mandate will also be crucial in accelerating the adoption of electric vehicles. The Province has already signalled that by 2040, 100% of light-duty vehicle sales will be made up by electric cars and trucks. Furthermore, resources from senior levels of government (e.g. transit) will be critical for success. Partnerships and collaboration with utilities, municipal governments, local businesses and residents will also be required.

This report outlines recommendations and options for Council consideration that can be implemented now or in the near future, that will have the largest reduction impact on Maple Ridge's greenhouse gas emissions, or that will help to position the City of Maple Ridge among those municipalities leading the transition to a low-carbon economy. It should be acknowledged that there are also numerous climate change adaptation actions being taken within City departments, some of which may also reduce greenhouse gas emissions.

2 Approach

This scoping report was developed using the following approach to help identify appropriate policy options for Council's consideration:

1. A detailed review of Maple Ridge's community greenhouse gas emission sources. As Council heard in July 2020, the majority of greenhouse gas emissions arise from buildings and on-road transportation. The review and earlier reports helped to illustrate the issues, advantages, challenges/gaps, resources and opportunities the City is facing with respect to embarking on an emissions reduction program.
2. Consultation with: working groups such as Metro Vancouver's Regional Engineering Advisory Committee's Climate Protection Subcommittee, BC Hydro's Sustainable Communities group of local and Provincial Government and other stakeholder staff, the Provincial Climate Action Secretariat, the Union of British Columbia Municipalities' Climate Action Committee, and the Federation of Canadian Municipalities' Green Municipal Fund; staff at the City of Maple Ridge; and colleagues at other local governments.

3. An in-house gap analysis to determine what research, actions and policy development are currently underway, and where additional effort would have the most impact.
4. A comparative scan of what other municipalities have learned and are doing to reduce community greenhouse gas emissions. This included a review of which of these strategies and/or options might align with other Council objectives, regional goals such those of the Climate 2050 Plan currently in development, and the provincial CleanBC Plan. A wide range of policies and actions to reduce community greenhouse gas emissions and adapt to climate change have been utilized throughout the region and more broadly. Some were studied at the municipal and regional levels, and some have follow-up studies to test the actualized results. Some have benefits beyond climate action, with community benefits including health, comfort, convenience and liveability.
5. In-depth research into two policy areas having potential to significantly reduce emissions, that will continue to deliver reductions over a long period of time, and that have been implemented successfully in other jurisdictions. Those are: 1) implementing the BC Energy Step Code and 2) strengthening electric vehicle charging infrastructure requirements.

This report is not intended to be an all-encompassing master plan addressing climate change. Rather, it outlines a selection of options for Council consideration that could form an action plan to help reduce community greenhouse gas emissions from existing and future sources. Additional measures that require enabling by senior regulatory bodies have been omitted at this time. And yet others are being implemented within other City departments.

The two areas with the most potential to deliver on greenhouse gas emission reductions in Maple Ridge at this time are:

- Enable Home Energy Retrofits for existing building stock, and
- Enable zero-emission vehicle (ZEV) adoption.

A third area:

- Enable the BC Energy Step Code for new buildings,

is one that will become entrenched into the BC Building Code in increments over the coming decade or so. Council has the ability to enable the requirements earlier, so that buildings constructed before the standards are mandated by the Province will benefit from greater energy efficiency. It is substantially more cost-effective to do this at construction rather than retrofitting later.

On September 29, 2020, Council received a report on Council advisory committees and approved several amendments made by the Advisory Committee Task Force. Also referenced in the report was a new committee for which Terms of Reference are being drafted for Council consideration.

This next section offers a recommendation to update the City's greenhouse gas emission reduction targets. The remainder of the items are options that are recommended for referral to the newly proposed Community Development and Enterprise Services Advisory Committee.

3 Policy Options

3.1 Official Community Plan Amendments

3.1.1 Greenhouse Gas Emission Reduction Targets

All municipal governments in British Columbia are required to include greenhouse gas emission reduction targets in local Official Community Plans and Regional Growth Strategies, along with supporting policies and actions. Policy 5-45 in the City of Maple Ridge Official Community Plan states:

The District of Maple Ridge has a goal to reduce community greenhouse gas emissions by 33% below 2007 levels by 2020 and 80% by 2050.

In 2018, the vast majority of the world's governments formally adopted a report referred to as "SR15" issued by the Intergovernmental Panel on Climate Change (IPCC)¹. It concluded that in order to avoid the worst impacts of a global rise in temperature, worldwide emissions must be reduced by 45 percent by 2030 compared with 2010 levels, and that net emissions must be reduced to zero by 2050.

In recent years, a number of local governments have been updating their sustainability plans and adopting new reduction targets. In late 2019, Metro Vancouver proposed an amendment to the reduction targets in the current Regional Growth Strategy. On January 14, 2020, City of Maple Ridge Council endorsed those targets.

In the absence of a comprehensive energy and emissions plan that would enable the City to quantify reduction targets based upon the estimated impact of specific policies and actions, it is recommended that the City adopt the regional target as an aspirational goal.

Recommendation: That staff bring forward an Official Community Plan amending bylaw for public consultation to update Policy 5-45 for greenhouse gas emission targets to net zero by 2050 from 2010 levels, with an interim target of 45% reduction by 2030, in alignment with the International Panel on Climate Change.

Recommendation for referral to committee: Review public feedback and provide recommendations.

For more on the history and approach to GHG target-setting in Maple Ridge, see Attachment 6.1.

¹ Full Report: <https://www.ipcc.ch/sr15/> ; Summary for Policy-makers: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

3.1.2 OCP Policy Alignment

Metro Vancouver 2040: Shaping our Future is the current regional growth strategy. *Metro Vancouver Climate 2050*, a regional growth strategy update is currently underway, and expected to be ready for mid-2022.

As a legislated requirement, member municipalities are required to update regional context statements. These statements set out the relationship between the regional growth strategy and each municipality's official community plan, and how the latter will be made compatible over time. The statement is subject to acceptance by the regional district, to ensure the municipality and the region agree that the two documents are compatible. The City expects to begin this work in 2021.

Metro Vancouver's Climate 2050 Strategic Framework includes a graphic illustrating how a carbon neutral region can be achieved through a combination of deep emissions reductions in all sectors and some carbon removal. It will require unprecedented greenhouse gas reductions across most sectors. Metro Vancouver is completing further analysis for each of the emissions sources to understand the pathways to deep emission cuts.

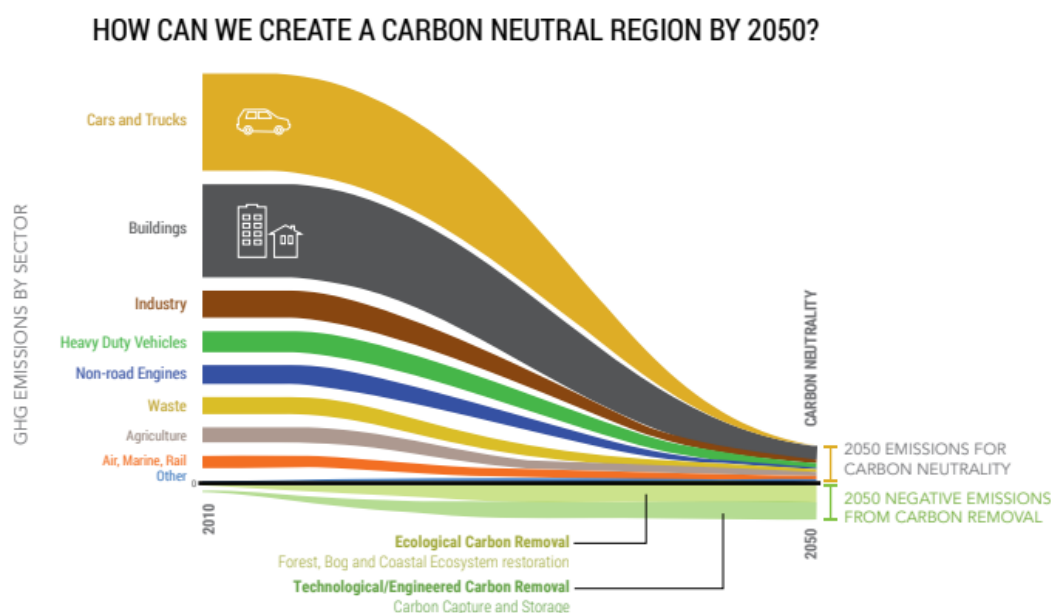


Figure 1 Source: Metro Vancouver Climate 2050 Strategic Framework - illustration of how a carbon neutral region can be achieved by a combination of deep emissions reductions in all sectors and some carbon removal.

The City of Maple Ridge's Official Community Plan's sections 5.5-Air Quality and 5.6-Planning for Climate Change both include policies relating to greenhouse gas emissions. Since the time they were developed, much has changed globally and locally. Following the Regional Context Statement review and development work, these two sections could be updated with new contextual information, issues, objectives and policies.

Recommendation for referral to committee. Review staff recommendations on proposed amendments to Official Community Plan sections 5.5-Air Quality and 5.6-Planning for Climate Change and provide feedback.

3.2 Reducing GHG Emissions in Buildings

A review of community greenhouse gas emissions inventories from 2007, 2010 and 2012 shows that about one-third of community emissions are generated from buildings and infrastructure throughout Maple Ridge. Of those building emissions, well over 90% are generated from natural gas usage, with the remainder coming from BC's low-carbon hydro electricity. Further, 73% of building emissions are generated by the residential sector, with the remainder coming from commercial and small-to-medium industrial (CSMI). The 2012 community greenhouse gas emissions profile is illustrated as follows:

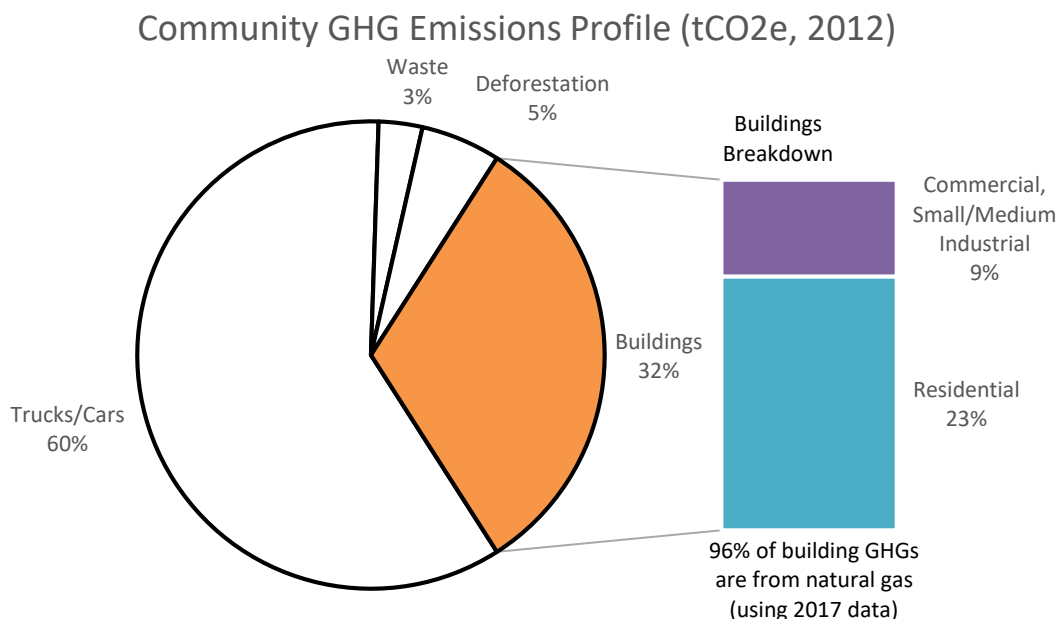


Figure 2 Community GHG Emissions Profile (tCO₂e, 2012) – note that while more current data is available for most categories, 2012 transportation data is the most current available at this time, making 2012 is the most recent community emissions profile.

Two key strategies to reduce greenhouse gas emissions from the buildings sector are:

- Strengthen energy efficiency requirements in new buildings, and
- Improve energy efficiency in the existing building stock.

The next set of policy options addresses these areas.

3.2.1 Energy Efficiency Requirements for New Buildings

The BC Building Code is the Provincial regulation that governs how new construction, building alterations, repairs and demolitions are completed. The code establishes minimum requirements for safety, health, accessibility, fire and structural protection of buildings and energy and water efficiency. The BC Building Code is based on the model National Building Code and an updated Code is issued every five years.

The BC Energy Step Code is an optional compliance path in the BC Building Code that local governments may use if desired, to incentivize or require a level of energy efficiency in new construction that goes beyond the base requirements of the BC Building Code. Through increasingly stringent requirements for energy use, thermal demand and air tightness, the Step Code provides a performance pathway to support market transformation to net-zero energy ready buildings by 2032.

The general concept of the Step Code is that each upcoming update of the Building Code, beginning in 2022, will entrench the performance standards of the lower voluntary step(s), which then become the minimum standard. By implementing the Step Code, the City will be accelerating energy-efficiency and reduced greenhouse gases, in advance of Provincial standards.

- ❖ Attachment 6.2 provided detailed information on the BC Energy Step Code.
- ❖ Attachment 6.3 provides further information on stakeholder implications and costing.
- ❖ Attachment 6.4 is a Comparative Scan showing the BC Energy Step Code adoption levels of other municipalities.
- ❖ Attachment 5.5 provides information on Stakeholder Consultation.

As of March 2019, 70% of all new residential construction was subject to the BC Energy Step Code. Throughout the subsequent 18 months, that number has been steadily growing.

Recommendation for referral to committee: Implementation of the BC Energy Step Code for both Part 9 (simple) and Part 3 (complex) buildings, including an approach for exempting in-stream application, potential utilization of a density bonus to provide an incentive to encourage higher BC Energy Step Code standards for new development, and proposed effective dates for implementation and for subsequent step increments.

3.2.2 Home Energy Labelling

A home's energy use can be indicated using a label, much like the Energy Star labels found on home appliances. The home energy label can be positioned on a home's electrical panel to convey the home's energy performance upon construction completion. The benefits of labelling include:

- educating new home buyers with direct access to performance data;
- providing an effective marketing tool highlighting energy efficiency as a selling feature;
- offering builders a way to differentiate and drive demand for above-code construction.

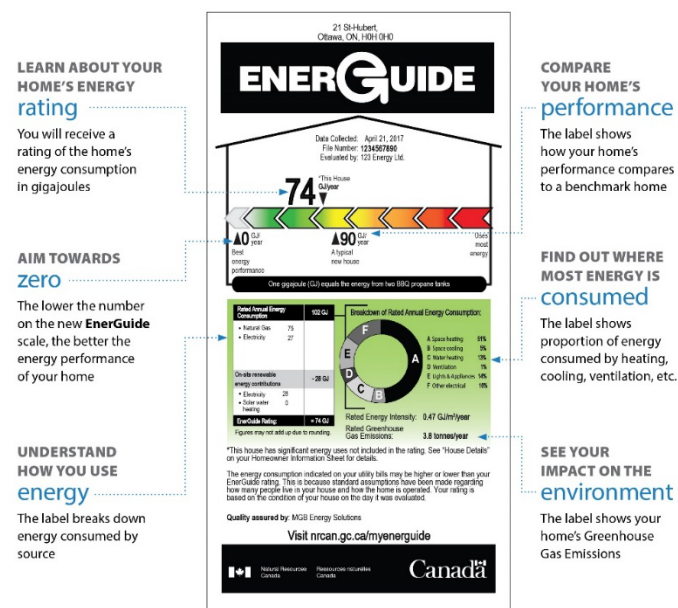
As part of the BC Energy Step Code compliance pathway, the information for an energy efficiency label is generated, and therefore labelling can be implemented at no additional cost. In situations where construction is not Step Code compliant:

- ❖ Estimated costs can found in Attachment 6.6.
- ❖ The Comparative Scan in Attachment 6.4 shows the municipalities requiring home energy labelling.
- ❖ Attachment 5.7 provides more information about the EnerGuide label, one option for home energy efficiency labelling.

Over 400 homes in Maple Ridge are already voluntarily labelled, as part of a region-wide pilot project titled *Rate Our Home*. The results currently reside with the Province, who are engaging with the Greater Vancouver Real Estate Board on the topic.

Recommendation for referral to committee: Implementation of Home Energy Labelling requirements, and recommendations on the public disclosure of home energy labelling information.

- ❖ The case for Home Energy Labelling is comprehensively discussed in a July 2018 report titled "Put a Label On It – The BC Energy Step Code & Home Energy Labelling Disclosure" at http://energystepcode.ca/app/uploads/sites/257/2019/11/PutALabelOnIt_FINAL_V1.2.pdf



3.2.3 Accelerating Energy Efficiency Retrofits for Existing Buildings

Maple Ridge's existing building stock is responsible for over 150,000 tonnes of carbon dioxide equivalent (a measure of greenhouse gas emissions), or about one-third of the community's total emissions. They are generated by the use of electricity and natural gas. Due to British Columbia's supply of low-carbon hydro electricity, over 95% of these emissions come from natural gas use.

	2007	2010	2012	2013	2014	2015	2016	2017
Electricity	13,598	13,278	7,466	5,632	5,916	5,880	6,027	6,219
Natural Gas	145,916	132,920	134,657	132,469	127,853	118,852	128,939	147,919
Grand Total	159,513	146,198	142,123	138,101	133,769	124,732	134,965	154,138

Table 1 tonnes of carbon dioxide equivalent (CO₂e) emissions from Maple Ridge, community-wide

The Federation of Canadian Municipalities' Green Municipal Fund developed a resource titled "*GMF Municipal Energy Roadmap – A guide to help Canadian municipalities prioritize and tackle deep greenhouse gas emissions reductions in municipal and community buildings.*"² It provides valuable insight into cost-effective ways to reduce GHG emissions and mitigate the impacts of climate change, while also ensuring a good quality of life for current and future residents.

Of the ~148,000 tCO₂e emissions from natural gas use in 2017, over 100,000 tonnes were from residential use. The majority of this was used for space heating, followed by water heating. Measures to reduce natural gas consumption through fuel switching to electricity have the greatest potential to reduce community greenhouse gas emissions, followed by reductions through enhancing efficient use of natural gas for space and water heating. Examples of these measures include:

Space Heating	Other
Heat pumps replacing natural gas Heat pumps replacing electric resistance Building envelope upgrades Improved HVAC controls	Low-carbon water heating High-efficiency lighting and reduced plug loads Rooftop solar PV

Table 2 Examples of home energy retrofit options

For existing home owners in particular, decisions such as the above can be fraught with time-consuming research, much uncertainty, and in some cases, lessons learned the hard way. A similar but more complex barrier exists for strata owners. Council may wish to consider providing a program to support Maple Ridge residents with energy upgrade decisions. Elements of a program could include resources, group education sessions and webinars, one-on-one assistance, pre-vetted service providers and products, bulk purchasing programs, and streamlined or subsidized permitting.

Recommendation for referral to committee. Development of a program to support energy efficiency retrofits for existing community-wide building stock.

² <https://fcm.ca/en/resources/gmf/gmfs-municipal-energy-roadmap>

3.3 Reducing GHG Emissions in Transportation

3.3.1 Supporting the Transition to Zero Emission Vehicles (ZEV)

The BC Government's *Zero-Emission Vehicles Act* was passed in May 2019. The associated *Regulation* came into effect in August 2020. It will meet increasing consumer demand for ZEVs in a variety of models and price ranges. It also provides regulatory certainty for achieving CleanBC targets. CleanBC actions also include making it easier to charge ZEVs, building industry capacity for servicing ZEVs, and speeding up the switching to cleaner fuels.

The regulation aims to see 10% of light-duty vehicle sales as ZEVs by 2025, 30% by 2030 and 100% by 2040. This mirrors the Government of Canada's sales targets in the *Pan-Canadian Framework for Clean Growth and Climate Change*. The *Zero-Emission Vehicles Act* has a prohibition backed by penalties for suppliers that states:

On or after January 1, 2040, a person must not make a consumer sale of a light-duty motor vehicle that is not a zero-emission vehicle.

A "light-duty vehicle" means a passenger car or any motor vehicle having a gross vehicle weight of 2,800 kg or less, for which a motor vehicle licence is required under the *Motor Vehicle Act* or the *Commercial Transport Act*.

City of Maple Ridge requirements for roughed-in electrical vehicle charging infrastructure for new development came into effect through the following process:

- On July 17, 2018 at Council Workshop, Council considered proposed regulatory changes pertaining to electrical vehicle charging infrastructure for new development, and approved a consultation process to engage the development community³.
- At the December 11, 2018 Council Meeting, Council received a consultation summary indicating broad levels of support for the proposed requirements⁴, and directed staff to explore regulatory approach to a construction "rough-in" requirement.
- On March 12, 2019 at Council Workshop, Council received this information⁵ and directed staff to prepare the bylaw amendment to integrate the revised requirements.
- On July 23, 2019, Council adopted the Off-street Parking and Loading Amending Bylaw.⁶

In light of the Province's zero-emission vehicle mandate, Council may wish to strengthen and expand the requirements for charging infrastructure. Rebates are currently available, and accelerating the requirements for charging infrastructure will mean more subsidies for Maple Ridge citizens and businesses.

- ❖ Attachment 5.7 is a comparative scan showing what other municipalities are doing.
- ❖ Attachment 5.8 shows Maple Ridge requirements adopted in July 2019.

Recommendation for referral to committee. Recommendations to strengthen development requirements for electric vehicle charging infrastructure.

The above option will address charging infrastructure in new buildings. The next section provides an option for accelerating the addition of chargers to existing buildings.

³ <https://www.mapleridge.ca/AgendaCenter/ViewFile/Agenda/07172018-3087> item 4.4

⁴ <https://www.mapleridge.ca/AgendaCenter/ViewFile/Agenda/12112018-3136> item 1001

⁵ <https://www.mapleridge.ca/AgendaCenter/ViewFile/Agenda/03122019-3185> item 4.2

⁶ <https://www.mapleridge.ca/AgendaCenter/ViewFile/Agenda/06252019-3263> item 1105

3.3.2 Electric Vehicle Charging Infrastructure Support Program

Most electric vehicle owners do the bulk of their required charging overnight where they live. Because older buildings don't typically have charging infrastructure, the vast majority of electric vehicle owners live in single-family homes. This limits the ability of condominium dwellers to own electric vehicles, slowing the transition to low-carbon transportation.

The implementation of electric vehicle charging infrastructure in stratified buildings can be a complex process. Some of the barriers include:

- The electrical grid for some buildings may be already at capacity;
- Strata councils may lack the budget to install charging infrastructure;
- The cost of individual meters paid for by EV owners can be cost-prohibitive;
- Strata bylaws may require 75% of the owners to agree to paying the expense;
- Strata councils often have limited resources and may be unlikely to address the request;
- Deciding who pays for the capital expense, and for the charging electricity, can be sensitive.

Rather than individual strata councils trying to navigate their way through the process, the City could provide a liaison service, linking strata members with the resources necessary for creative solutions and informed decisions.

Recommendation for referral to committee. Development of an assistance program to aid strata members in retrofitting existing buildings with electric vehicle charging infrastructure.

4 Existing Sustainability Workplan

In addition to supporting the Council discussion on policy items presented within this report, staff are continuing to work on supplemental items that align with Council's Strategic Plan and its focus on the environment and efficiencies. Some are highlighted in this next section.

4.1.1 Financing Community Energy Efficiency

While investments in new energy systems and retrofits can often improve comfort as well as energy use, it can take time to recover the cost of the improvements through energy savings. In many cases, homeowners don't expect to own their current home long enough to reap a financial payback. Some homeowners lack access to the upfront capital needed to make such investments. The City can help homeowners overcome these barriers. Attaching financing to the property rather than a person is one way to allow for a matching up of investment payments with reduced energy costs. And it can encourage uptake in the rental market, where the owner may not bear the burden of monthly energy expenses.

According to GMF's Municipal Energy Roadmap, and not BC-specific:

"Financing options have become an increasingly popular tool to support the adoption of efficient, clean energy technologies by addressing market barriers and increasing access to low-cost, long-term capital."

There are several approaches to financing energy efficiency, such as on-bill financing through utility bills, Property Assessed Clean Energy (PACE) or local improvement charges (LIC). A working group is underway, bringing together GMF, Provincial, utility and local government staff to develop enabling legislation to support the use of financing tools in British Columbia.

4.1.2 Climate Change Consideration in Corporate Processes

Staff reports to Council are structured to ensure implications relating to finance, customers, other departments, and policy are covered. The Official Community Plan contains numerous policies relating to climate change, providing an opportunity for staff to address climate change in the report structure. Altering the report format will help to raise the profile of climate change implications and provide an opportunity to address the community energy and emissions impacts of staff recommendations and alternatives. This will ensure the climate change discussion is formalized in Council's decision-making process. It can also be built into other corporate tools and processes, such as purchasing and other policies.

4.1.3 Bulk Purchasing

As noted earlier, there are many factors influencing the City's greenhouse gas emissions, and many of them are outside Council's control. Citizen purchasing decisions are one those factors. Some local governments have arranged for bulk purchasing of products on behalf of citizens, where this aligns closely with Council objectives. Two examples are solar panels and electric vehicles. Staff are investigating the provision of bulk purchasing on behalf of citizens, for products and services that will reduce community greenhouse gas emissions.

4.1.4 Land-Use Modelling

New development and land-use planning decisions require careful consideration as they affect the scale, scope, and type of infrastructure needs. The infrastructure needed could be a combination of both “grey” constructed infrastructure and “green” infrastructure, using nature to provide the services. Greenhouse gas emissions are sequestered in trees, vegetation and soils. Land development releases stored emissions, and releases new greenhouse gases over the long term, unless the development is net-zero. The financial and environmental impacts of these development and land-use decisions will influence long-term community and fiscal sustainability and climate resilience. Staff are investigating the use of infrastructure life-cycle costing to compare the use of greenfield land for development against the value of engineering and other services provided by retaining the land in its natural state.

4.1.5 Public Electric Vehicle Charging Infrastructure

The City has Level-2 chargers available for public use both above-ground and in the parkade. Level-3 or “fast” chargers allow for a much faster charge – to about 80% charge in 40 minutes. The closest Level-3 chargers to Maple Ridge is in Port Coquitlam to the west, and in Mission to the east. Staff are working with BC Hydro to bring this higher service level to support the transition to zero-emission vehicles and to support local business and tourism.

4.1.6 Home Energy Efficiency Mapping

Technology such as artificial intelligence and city-wide thermal infrared imagery can be combined with existing data sources to indicate the relative energy efficiency of the City’s existing building stock. Data visualization can then provide a mapped view which can be used to inform City programs to encourage energy retrofits. With homeowner participation, energy efficiency analysis can be extended to systems and appliances inside the home. Staff are exploring options that will help achieve GHG reduction targets while also providing benefits to residents.

4.1.7 Municipal Natural Assets

Along with the options presented within this report, the use and expansion of green infrastructure, retention of trees and restoration of natural areas, maximization of permeable surfaces and attention to the heat island effect are a few of the topics critical to climate change adaptation. Council will be hearing more on these issues relating to environmental management and natural assets in the future. Part of the Sustainability workplan will include supporting the Municipal Natural Assets Initiative, to the extent that Council approves this work in future.

5 Closing Content

5.1 *Strategic Alignment*

5.1.1 Official Community Plan

The Official Community Plan includes several policies that support the options highlighted in this report.

- 5-39 Maple Ridge will continue to participate in National, Provincial, and Regional programs aimed at reducing air and greenhouse gas emissions.
- 5-40 Maple Ridge will promote energy efficiency to reduce air and greenhouse gas emissions by:
 - a) participating in emissions management programs such as the Greater Vancouver Regional District air quality management program;
 - b) encouraging alternative transportation initiatives, promoting 'clean' transportation options, and encouraging the use of public transit;
 - c) promoting green space and natural areas;
 - d) exploring opportunities for non-fossil fuel energy efficient systems in municipal buildings and infrastructure;
 - e) maintaining and enhancing the District's forests and woodland areas; and
 - f) encouraging tree retention and tree protection programs.
- 5-41: Maple Ridge will encourage the use of energy efficient site design and building practices in all new developments when appropriate.

5.1.2 The Union of British Columbia Municipalities (UBCM)

In 2019, the Union of British Columbia Municipalities (UBCM) struck a Special Committee on Climate Action to generate new ideas, explore opportunities and barriers to local government action, and identify avenues for further partnership work in mitigating, and adapting to, the effects of climate change. The committee is comprised of elected officials and senior staff from local government, as well as representatives from the Province, environmental non-governmental organizations, crown corporations and academia.

Over the past nine months, the Committee has been considering the state of climate action, local government approaches and best practices in mitigation and adaptation, and the roles and responsibilities of the orders of government and external stakeholders in supporting local action. The Committee has also been reviewing opportunities and barriers to taking climate action to the next level, and propose options that are sensitive to local conditions, autonomy, and resources. The Committee has generated a draft report of its findings and have engaged with local government stakeholders through webinars for feedback on the 21 draft recommendations. The next step will be finalization of the Committee's recommendations, with consideration by the UBCM Executive targeted for November 2020.

An excerpt from the introductory section of the report reflects comments expressed by Council members during discussions on a variety of policy issues and decisions, and supports the recommendation and options presented in this report.

British Columbia local governments can continue to build prosperous, fair, resilient communities by capitalizing on the opportunity of low carbon solutions that meet their unique context.

We can build communities where:

- *All buildings are comfortable, leverage local resources and are low cost to operate*
- *All British Columbians have transportation choices, like an electric personal vehicle or public transit, and feel safe moving around the Province*
- *Across all sectors, we waste less and, when do create waste, we turn it into a clean resource*
- *Communities all across the Province are safe, secure, and resilient to risks like wildfires, floods and extreme weather*
- *Residents and businesses are active partners with the local government in ensuring the safety of the community and building a vibrant low carbon economy*
- *We create opportunities for our local industries to build on their strengths while providing new training and employment opportunities as we create demand for British Columbia's innovative, sustainable products*

The report recommendation and options are also consistent with the regional *Climate 2050 Framework*, the *CleanBC Plan* and the *Pan-Canadian Framework on Clean Growth and Climate Change*.

5.2 Departmental Implications

In order to implement options in this report, a number of regulatory and informational work will be required of various departments. For example:

- Amendments may be required to some or all of the following: Building Bylaw, Official Community Plan, Development Permit Procedures Bylaw, Development, Permit Area Guidelines for Form & Character, Development Application Fees Bylaw, Development Application Submission Requirements, and the Development Checklist;
- The City's website will require an area connecting developers, builders, citizens and strata members with information and resources, and training programs may be required;
- Staff may need additional training, such as inspections staff who would be required to ensure compliance with the BC Energy Step Code.

Additional implications may be identified upon further consultation within City departments. Capacity within existing business plans, particularly in Planning, Building and Engineering may need to be reviewed and priorities adjusted.

5.3 Financial Implications

The City has a reserve for the Climate Action Revenue Incentive Program. This essentially is a rebate provided back to local governments since the BC Carbon Tax was implemented, in order to make it "revenue neutral." Council may wish to consider using the funds, currently \$440,000 with an annual inflow of about \$60,000, to fund some of the options presented in this report in order to avoid a property tax incremental increase. This would be in alignment with the intent of the reserved funds.

5.4 CONCLUSION:

This report provides a number of options Council may wish to investigate or implement to advance the community toward a low-carbon future. The options of interest to Council will inform the 2021 business plan for the Corporate Planning and Consultation Department. The report also recommends that the City's carbon emission reduction targets be amended to align with the International Panel on Climate Change.

Prepared by: **Laura Benson, CMA, CPA**
Senior Policy and Sustainability Analyst

Approved by: **Christina Crabtree**
GM Corporate Services

Concurrence: **Al Horsman**
Chief Administrative Officer

5.5 Related Content:

- [July 14, 2020 Council Meeting Agenda](#), item 1151
- [July 7, 2020 Committee of the Whole Agenda](#), item 1151
- [May 26, 2020 Council Meeting Minutes](#), item 601
- [January 14, 2020 Council Workshop Agenda](#), item 4.2
- [March 23, 2010 Council Meeting Agenda](#), item 1201
- [February 15, 2010 Council Workshop Agenda](#), item 4.1

6 **Attachments:

- 6.1 GHG Reduction Targets – Background and Approach
- 6.2 BC Energy Step Code
- 6.3 BC Energy Step Code Costing Information
- 6.4 BC Energy Step Code Adoption Comparative Scan
- 6.5 BC Energy Step Code Stakeholder Consultation
- 6.6 Home Energy Labelling Costs
- 6.7 Guide to the EnerGuide Label for Homes
- 6.8 Electric Vehicle Charging Infrastructure Comparative Scan & Rebates
- 6.9 Maple Ridge EV Charging Infrastructure Requirements for New Development

**** Note that most of the text appearing to be hyperlinks on the attachments will not be active, as they are snapshots of documents – not “live” versions of them.**

6.1 GHG Reduction Targets – Background and Approach

In 2010, Council adopted the Provincial target of 33% reduction in greenhouse gas emissions by 2020 from 2007 levels, and 80% by 2050. At the time, Council discussed the merits of a top-down, inspirational target approach where a challenging and possibly unattainable goal was selected. The alternative was using a bottom-up approach, estimating the impacts of various policies and actions to establish an achievable target. The target Council selected was top-down, and aligned with the Province's goals in their 2008 *Climate Action Plan*. This target relied upon assumptions relating to energy pricing, population growth, economic activity and technology innovations, and the pathway to achieve 27% of the reductions required provincially to meet the target were not identified.

Percentage of Target Reductions Achieved by Sector

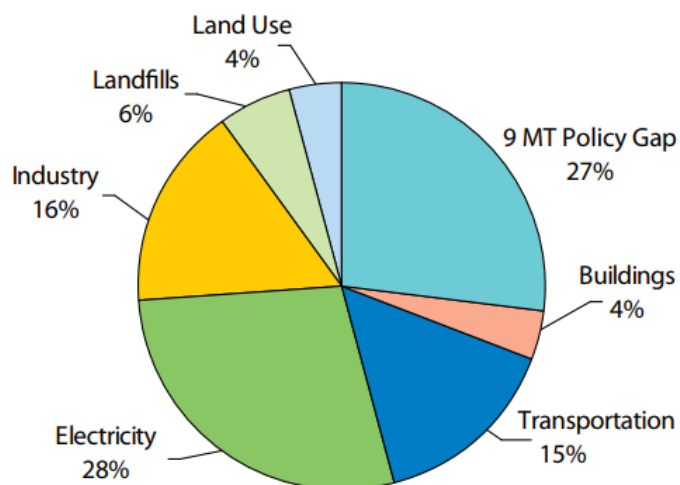


Figure 3 Source: 2008 BC Climate Action Plan – estimated impact of identified measures toward 2020 target of 33% reduction from 2007 levels.

In May 2018, acknowledging the impacts of the growing economy and population, the Province established additional strategies for greenhouse gas emissions, and introduced interim targets. Compared to 2007 levels, the reduction targets are: 40% by 2030; 60% by 2040; and 80% by 2050. The estimated reduction sources to achieve the 2030 target follow, showing unidentified reductions of 6.1 megatonnes.

Reductions to achieve 2030 target

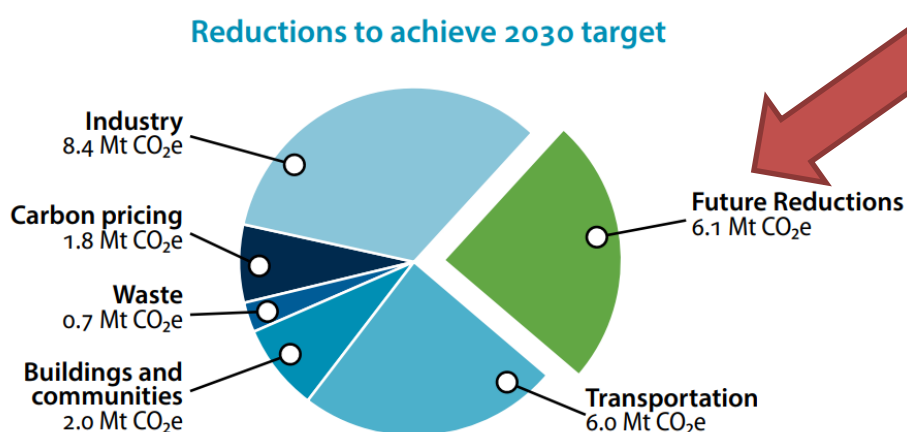


Figure 4 Source: 2018 CleanBC Plan – estimated impact by sector toward 2030 target of 40% reduction from 2007 levels.

In 2018, the vast majority of the world's governments formally adopted a report referred to as "SR15" issued by the Intergovernmental Panel on Climate Change (IPCC)⁷. Backed by 30 years of scientific study, it stated that emissions of greenhouse gases due to human activities, the root cause of global warming, continue to increase, year after year. It concluded that in order to avoid a temperature rise of more than 1.5 degrees Celsius, worldwide emissions must be reduced by 45 percent by 2030 compared with 2010 levels, and net emissions must be reduced to zero by 2050.

In recent years, a number of local governments have been updating their sustainability plans and adopting new reduction targets. Some are developing targets through comprehensive energy and emissions plans, similar to the approach undertaken by the Province in 2007/2008. In doing so, they are able to gauge the estimated impacts of various emission reduction measures, and decide whether to adjust their targets to reflect the likely outcome of identified actions, or to initiate additional or more impactful measures to achieve their stretch goals.

In late 2019, Metro Vancouver proposed an amendment to the regional growth strategy, revising earlier greenhouse gas reduction targets as part of their Climate 2050 plan development. On January 14, 2020, Council approved a resolution *"that the Type 3 minor amendment to Metro Vancouver 2040: Shaping our Future, reflecting a carbon neutral region by 2050, and an interim target of reducing greenhouse gas emissions by 45% from 2010 levels by 2030, be endorsed and the resolution forwarded to Metro Vancouver."* Metro Vancouver's target was established to align with the October 2018 Intergovernmental Panel on Climate Change (IPCC) Special Report to limit global warming to 1.5°C above pre-industrial levels.

The next illustration shows a timeline of the City's climate action milestones within the context of regional and global milestones.



Figure 5 Climate Action Milestones

⁷ Full Report: <https://www.ipcc.ch/sr15/> ; Summary for Policy-makers: https://www.ipcc.ch/site/assets/uploads/sites/2/2019/05/SR15_SPM_version_report_LR.pdf

6.2 BC Energy Step Code

ENERGY STEP CODE - Introduction⁸

The BC Building Code's historical, prescriptive approach sets out specific requirements for insulation, windows, furnaces, water heaters, lighting and other equipment and systems. This focus on individual elements doesn't ensure the building functions well as a system.

When purchasing a conventional new home, a home buyer may have access to energy performance information about individual systems, such as the furnace and appliances; however, the total energy performance of the building is unknown. Energy consumption is one of the highest ongoing operating costs of owning a building, and typically there is no way to compare the future energy consumption of two similar homes.

An energy-efficiency objective was introduced for the BC Building Code in 2008, along with an alternative to the prescriptive approach: a performance-based approach. In 2015 following the enactment of the modernized *Building Act*, the Province led a multi-year stakeholder collaboration effort resulting in BC Energy Step Code, a set of incremental building energy performance levels for new construction that apply across various building types and climate zones. Lower steps are easier to meet, and higher steps have more ambitious energy-efficiency requirements.

The B.C. Building Code regulates building in two main categories: simple buildings and complex buildings. These categories are used to define BC Energy Step Code requirements, where Part 3 is further broken down into residential wood-frame; residential concrete and commercial.

	MAIN TYPES OF BUILDINGS	
	Part 9 Buildings (Simple)	Part 3 Buildings (Complex)
Size	Most buildings three storeys and under in height and with a footprint of 600 square metres or less.	All buildings over three storeys in height or over 600 square metres in footprint. Some buildings three storeys or less in height or under 600 square metres in area that are of a specific use.
Description	Small buildings intended for residential, commercial or medium-to-low hazard industrial activities.	Buildings intended for public gatherings, residential care, detention or high-hazard industrial activities. Some larger buildings intended for residential, commercial or medium-to-low hazard industrial activities.
Examples	<ul style="list-style-type: none"> • Houses and duplexes • Small apartment buildings • Small commercial buildings with stores or offices • Small industrial shops 	<ul style="list-style-type: none"> • Shopping malls; Office buildings; Restaurants • Condos; Apartment buildings • Hospitals; Care facilities; Daycares; Schools • Churches; Theatres

Figure 6 Main Types of Buildings (source: BUILDING ACT GUIDE SERIES: SECTION A1 - Understanding B.C.'s Building Regulatory System - JUNE 2015)

The performance approach establishes a desired outcome, and leaves it to the design and building team to decide how to achieve it. To comply with the BC Energy Step Code, builders must use energy software modelling and on-site testing to demonstrate that both their design and the constructed

⁸ See <https://energystepcode.ca/how-it-works/> for more information.

building meet the requirements of the standard. They may use any materials or construction methods to do so.

Over time, high-performance designs, materials, and systems are expected to become increasingly available and cost-effective. By 2032, it is anticipated that the highest step for each category, “net zero ready”, will be a base requirement in the BC Building Code. “Net-zero energy” buildings are able to generate (supply) enough energy on-site to meet the building’s annual energy consumption (demand). The difference between being “net zero energy” and just being “ready” may be dependent on future available energy generation technologies.

Local governments can choose to require or incentivize builders to meet one or more steps of the BC Energy Step Code as an alternative to the code’s prescriptive requirements. This performance-based standard empowers builders to pursue innovative, creative, cost-effective solutions, and allows them to incorporate leading-edge technologies as they come available.



Figure 7 BC Energy Step Code "steps" for Part 9 homes



Figure 8 BC Energy Step Code "steps" for Part 3 Wood-frame Residential, as opposed to Residential Concrete or Commercial

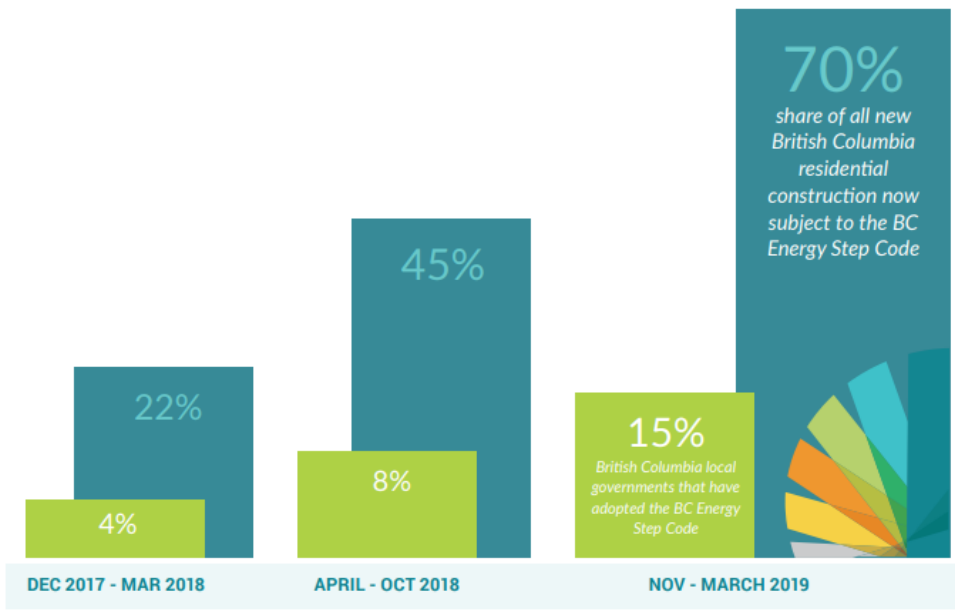
Maple Ridge Context

During the summer of 2017, the City partnered with the University of British Columbia and BC Hydro to commission a technical study titled *GHG Emission Reduction Potential of Energy Step Code Scenarios*. The analysis and calculations indicated that typical Part 9 buildings in Maple Ridge already met the Thermal Energy Demand Intensity (TEDI) requirement of lower steps (Step 1, 2 and 3), one of the measures of energy efficiency. Therefore the adoption scenarios for significantly reducing emissions from Part 9 buildings would need to come from the upper levels of the Step Code.

As an aside, this analysis of the potential for energy and GHG savings revealed that with a few adjustments, Step 3 of the BC Energy Step Code was already achievable or within reach of most Maple Ridge builders.

This was subsequently borne out with a follow-up study. Staff wanted to understand the cost premium and practical considerations that might be experienced by the local industry. Staff partnered again with BC Hydro, along with a local developer/builder, to have a typically-built home side-by-side with one built to BC Energy Step Code 3 standards as part of our *Maple Ridge Building Better* Program. The demo home was used for on-site training for staff and external stakeholders. The program also included a full-day hands-on classroom training day for 35 external stakeholders. The outcomes of the study are highlighted in Attachment 6.3.

FIGURE 1.2 ADOPTION AS SHARE OF TOTAL LOCAL GOVERNMENTS AND RESIDENTIAL BUILDING ACTIVITY, AS OF MARCH 2019



While only 24 of the province's 162 local governments have to date adopted the BC Energy Step Code, those that have done so oversee the lion's share of new residential construction. Lower-capacity communities are learning from the leaders, and more are adopting every month.

6.3 BC Energy Step Code Costing Information

A 2018 report prepared for BC Housing and the Energy Step Code Council titled *BC Energy Step Code - 2018 Metrics Research Full Report Update*⁹ includes as one of its overarching goals the exploration of “the costing impacts of applying various steps of the Step Code to different steps archetypes across multiple climate zones in BC.” In contrast to a 2012 study for the City of Vancouver¹⁰ which projected “modest increases in construction costs resulting from adopting higher building energy performance requirements,” the 2018 Metrics Research found that “the higher requirements have proven to have no demonstrable impact on cost.”

The analysis looks at thousands of building variables and scenarios across all climate zones (note that Maple Ridge is in Climate Zone 4, or CZ4 in the adjacent table) and calculates three cost metrics: incremental capital cost, net present value of long-term building operation, and costs per tonne of carbon abated.

A few quotes from page 27 (page 33 of PDF) with regard to Part 9 buildings are:

- “In summary, in Climate Zones 4-6 (where 95% of BC’s population resides), all buildings modelled were able to achieve Step 4 for less than a 3% incremental capital cost and achieve Step 3 for less than 2.4%.”
- “It is important to note that in Climate Zones 4, the achievement of Step 3 (the highest step for Commercial Office) could be achieved for less than a 1% cost premium for most cases. For MURB, these costs are substantially lower than what was originally anticipated.”

Of note is that these incremental cost percentages do not include any potential savings due to better building envelopes, such as lower operating costs and reductions in capital costs of mechanical equipment. And though they also exclude potentially higher design costs as the market adjusts, these will likely disappear over time.

Maple Ridge Context

Following the Provincial introduction of the BC Energy Step Code, the City decided to support local builders with training opportunities and a demonstration project. With funding support from BC Hydro, the City launched “Maple Ridge Building Better with the Energy Step Code,” a builder and staff capacity building project. The project included a builder workshop in early 2018, energy modelling training for building department staff, blower door test equipment for City staff, and collaboration with a local builder and third-party Energy Advisor to build and document the construction of a Step 3 home.

Archetype	Step	CZ4
10 Unit MURB	1	0.1%
	2	0.4%
	3	0.3%
	4	0.7%
	5	1.7%
6 Unit Row House	1	0.2%
	2	0.4%
	3	1.1%
	4	2.0%
	5	3.4%
Quadplex	1	0.2%
	2	1.2%
	3	2.1%
	4	3.3%
	5	6.1%
Large SFD	1	0.2%
	2	0.1%
	3	0.5%
	4	1.5%
	5	4.2%
Medium SFD	1	0.2%
	2	0.2%
	3	0.8%
	4	1.8%
	5	3.6%
Small SFD	1	0.4%
	2	2.4%
	3	4.7%
	4	7.5%
	5	13.5%

Figure 9 Lowest First Costs (% change)
– Part 9 Buildings (source: 2018 Metrics Research Full Report Update)

⁹ 2018 Metrics Research Full Report Update http://energystepcode.ca/app/uploads/sites/257/2018/09/2018-Metrics_Research_Report_Update_2018-09-18.pdf, a 2018 update to the 2017 Full Report: https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/reports/bc_energy_step_code_metrics_research_report_full.pdf

¹⁰ Building Energy Code Update Study - City of Vancouver (2012). Prepared by BTY Group and Stantec Consulting Ltd

ATTACHMENT 6.3

Fernwood Development's Corey Siemens responded to the City's request for expressions of interest to build a Step 3 home because he was interested in building more energy efficient homes and learning more about the Energy Step Code, and he was building two similar homes side-by-side in a subdivision in the Albion area.

The four-bedroom 2600 sq.ft single-family home with unfinished basement is a typical spec home for this Maple Ridge neighbourhood. Mr. Siemens already had the completed design when he started working with Energy Advisor, Donald Taylor from DW Energy Advisors. It is ideal to engage an Energy Advisor as early in the process as possible, as making minor changes to the design can be a cost-effective way of improving energy performance.

These two houses look very similar, but the one on the left is 20% more energy efficient and cheaper to operate. Fernwood tracked the incremental costs building the two homes, and the Step 3 home came in at less than 2% more than the typical house.



Corey Siemens of Fernwood Developments specializes in both high-end custom and affordable single-family residences.



6.4 BC Energy Step Code Adoption Comparative Scan

The next table highlights a selection of municipalities who have adopted the BC Energy Step Code as a city-wide policy, along with general notations. Some require higher steps where rezoning is required or where the development is within a local area plan boundary. Some offer incentives to encourage builders to voluntarily use the BC Energy Step Code. It is important to note that some of the detailed characteristics behind this general overview have been excluded for comparison purposes.

Abbreviations used in the table:

*Part 9: SF-Single family; TH-Townhome; DP-Duplex; LR-Low-rise Apartment; Res-Residential

**Part 3: RW-Residential woodframe; RC-Residential concrete; OR-Office/Retail; TB-Tall buildings

***LCES-Low Carbon Energy Systems; DES-District Energy System; GHGI-Greenhouse Gas Intensity=equivalent carbon emissions that result from the energy used by the building in a year.

Municipality	Part 9 – see types*	Part 3 – see types**	Other
Vancouver	2017-Step 3+ for SF and DP 2018-Step 3+ for TH and LR -Rezoning requires Step 4	2018-Step 3+ for RW -Rezoning requires Step 4 2018-Step 4 for TB 2019-Step 2 for OR -Rezoning requires Step 4 2020-Step 3 for RC	Floor space exclusion for improved building performance
Burnaby	2019-Step 1 Home energy labelling req'd	2019-Step 1 for Res -Rezoning requires Step 3, or Step 2 with LCES and GHGI*** 2020-Step 3 for Res Benchmarking required	Mid-construction blower door test required
Surrey	2019-Step 1 2021-Step 3, except Step 2 for < 1200sq ft 2022-Step 4 for TH and LR; Step 3 or 4 for remaining Home energy labelling req'd	2019-Step 3 for Res, or Step 2 with LCES/DES 2019-Step 2 for Comm,OR 2022-Step 4 Benchmarking required	Free mid-construction blower door test
Richmond	2018-Step 1 for SF/DP 2018-Step 3 for TH/LR Home energy labelling req'd	2018-Step 3 for WF 2018-Step 3 for RC, or Step 2 with LCES/DES 2018-Step 2 for OR Benchmarking required	-Free/subsidized air tightness training; - Free drywall blower door tests for SF/TH before SC takes effect -Thick wall exclusions; FSR exclusions for green energy in SF/TH

Municipality	Part 9 – see types*	Part 3 – see types**	Other
Township of Langley	2019-Step 2 within Dev Permit Areas; Step 1 outside of DPAs 2020-Step 2 outside DPAs 2021-Step 3 within Dev Permit Areas 2022-Step 3 outside DPAs	2019-Step 2 within Dev Permit Areas; Step 1 outside of DPAs 2020-Step 2 outside DPAs 2021-Step 3 within Dev Permit Areas 2022-Step 3 outside DPAs	-\$300 subsidy for airtightness testing -SF: \$1000 for Step 4, \$1500 for Step 5 -TH/DP: \$300 for Step 4, \$500 for Step 5 -renovation incentives
New Westminster	2019-Step 1 2020-Step 3, except carriage home Step 2 Home energy labelling req'd	2020-Step 3, or Step 2 with LCES for WF/RC and hotels 2020-Step 2 for OR Benchmarking required	Mid-construction blower door test required
City of North Vancouver	2017-Step2, Res>1200ft2 2018-Step3, Res>1200ft2 2018-Step1, Res<1200ft2	2017-Step 1 2018-Step 2 for Res; and Step 3 with rezoning 2018-Step 2 for Commercial with rezoning	-\$300 for mid-construction blower door test -Moodyville LAP requires Passive House or highest step or 2 nd highest plus noise mitigation
District of North Vancouver	2018-Step 3	2018-Step 2 for Res, or Step 3 with rezoning 2018-Step 1 for Comm	
West Vancouver	2018-Step 3, or Step 1 for coach house; w rezoning is Step 4, or Step 2 for coach house 2021-Step 5, or Step 3 for LCES	2018-Step 2 for Res, or Step 3 w rezoning 2018-Step 1 for Comm, or Step 2 w rezoning 2021-Step 4, or Step 2 with LCES	
Port Moody	2020-Step 1, or Step 3 with rezoning 2021-Step 3 Home energy labelling req'd	2020-Step 2 for WF/RC, or Step 1 with LCES, or one step higher w rezoning 2020-Step 1 for Other, or w rezoning is Step 3 or Step 2 with LCES 2021-Step 3 for WF/RC, or Step 2 with LCES 2020-Step 2 for Other Benchmarking required	Mid-construction blower door test required
District of Saanich	2018-Step 1 2020-Step 3, or Step 2 for <1200ft2 Home energy labelling req'd	2018-Step 1 2020-Step 3	

Municipality	Part 9 – see types*	Part 3 – see types**	Other
Victoria	2018-Step 1 2020-Step 3, or Step 2 for garden suite	2018-Step 1 2020-Step 3 for WF 2020-Step 2 for RC/Comm/OR	
Kelowna	2019-Step 1 2021-Step 3		
Maple Ridge	Not implemented	Not implemented	

The data also shows the future progression for some municipalities who have more certainty of policy direction, although most have said that implementation beyond a year or so will be determined based on a review of staff and industry experience with earlier phase(s) of adoption. A forward-looking estimated adoption timetable helps to communicate future policy intentions so industry stakeholders can adequately prepare. For this reason, Maple Ridge started communicating with the industry in 2018.

6.5 BC Energy Step Code Stakeholder Consultation

A critical element prior to establishing requirements or incentives to implement the BC Energy Step Code is industry stakeholder consultation. The BC Government's implementation process had perhaps the most comprehensive stakeholder engagement efforts of any relating to local government regulation. And since a number of municipalities in the region have already adopted the Step Code, industry stakeholders doing business in those jurisdictions will have a familiarity with the requirements, building technologies, suppliers, energy advisors and the process involved. Those without hands-on experience will have had several years to prepare for the City's eventual implementation of the Step Code.

The definition of customer should also be extended to the eventual occupants, owners and operators of new buildings in Maple Ridge. This quote was sourced from the American Council for an Energy-Efficient Economy:

"The value of energy efficiency in properly implemented construction standards is universally recognized as the easiest and most cost-effective way to help consumers save energy and money, make housing more affordable, and reduce air pollution. All of these benefits are difficult or impossible to capture if they are not taken into consideration at the time of construction."

Every building built to base code standards will likely remain that way for many years to come, with the downside of contributing unnecessary greenhouse gas emissions.

It should be noted that the City of Maple Ridge signalled an intent to adopt the BC Energy Step Code following its introduction through a Council resolution and publication on the Province's Step Code website. The City also provided several updates and educational sessions at City-hosted *Builders Forums*, in addition to the training provided through the *Maple Ridge Building Better* program and demo home highlighted in Attachment 6.3.

6.6 Home Energy Labelling Costs

As part of the BC Energy Step Code compliance pathway, the information for an energy efficiency label is generated. For situations where Step Code is being followed, labelling can be implemented at no additional cost. In situations where construction is not Step Code compliant, tables below provide an approximate incremental cost.

Part 9 Archetype	Energy Advisor Costs				
	Step 1	Step 2	Step 3	Step 4	Step 5
10-Unit MURB	\$1,200	\$1,360	\$1,920	\$3,200	\$4,800
6-Unit Row House	\$1,200	\$1,360	\$1,920	\$3,200	\$4,800
Quadplex	\$1,000	\$1,133	\$1,600	\$2,667	\$4,000
Large House	\$750	\$850	\$1,200	\$2,000	\$3,000
Medium House	\$500	\$850	\$1,200	\$2,000	\$3,000
Small House	\$400	\$680	\$960	\$1,600	\$2,400

Figure 10 Cost Estimates for Part 9 Energy Advisor Services - Climate Zone 4 (source: 2018 Metrics Research Full Report Update)

Part 9 Archetype	Blower Door Costs (All Steps)	Assumptions
10-Unit MURB	\$3,050	Mid Construction, Thermal Bypass, Check and Blower, Fan Test
6-Unit Row House	\$1,450	Mid Construction, Thermal Bypass, Check and Blower, Fan Test
Quadplex	\$1,250	Mid Construction, Thermal Bypass, Check and Blower, Fan Test
Large House	\$800	Mid Construction, Thermal Bypass, Check and Blower, Fan Test, 450, Final Blower Fan Test, 350
Medium House	\$600	Mid Construction, Thermal Bypass, Check and Blower, Fan Test, 350, Final Blower Fan Test
Small House	\$600	Mid Construction, Thermal Bypass, Check and Blower, Fan Test, 350

Figure 11 Cost Estimates for Part 9 Blower Door Tests - Climate Zone 4 (source: 2018 Metrics Research Full Report Update)

6.7 Guide to the EnerGuide Label for Homes

Source: EnerGuide Rating System – Technical Procedures – Version 15.1¹¹

GUIDE TO THE ENERGUIDE LABEL FOR HOMES

ENERGUIDE

Congratulations on taking an important step towards understanding the energy efficiency of your home. Your EnerGuide label and the companion Homeowner Information Sheet provide you with information about your home's energy use. Improving the energy efficiency of your home can lead to lower energy costs. Other benefits include improved comfort and indoor air quality, reduced consumption of and reliance on energy resources, and fewer greenhouse gas emissions. This guide provides you with information to understand your EnerGuide label by illustrating the features of two sample labels.

An example of a label for a high-performing home

21 St-Hubert,
Ottawa, ON, H0H 0H0

ENERGUIDE

Data Collected: April 21, 2017
File Number: 1234567890
Evaluated by: John Doe

74 GJ/year

1

2

Δ0 GJ/year

Best energy performance

4

Δ90 GJ/year

A typical new house

3

Δ102 GJ/year

Worst energy performance

One gigajoule (GJ) equals the energy from two BBQ propane tanks

Rated Annual Energy Consumption

102 GJ

• Natural Gas 75

• Electricity 27

On-site renewable energy contributions

-28 GJ

• Electricity 28

• Solar water heating 0

Overall Rating

= 74 GJ

Breakdown of Rated Annual Energy Consumption:

A Space heating 65%

B Space cooling 15%

C Water heating 10%

D Ventilation 5%

E Lights & Appliances 10%

F Other electrical 15%

Rated Energy Intensity: 0.47 GJ/m²/year

Rated Greenhouse Gas Emissions: 3.8 tonnes/year

Figures may not add up due to rounding.

This house has significant energy uses not included in the rating. See "House Details" on your Homeowner Information Sheet for details.

The energy consumption indicated on your utility bills may be higher or lower than your EnerGuide rating. This is because standard assumptions have been made regarding how many people live in your house and how the home is operated. Your rating is based on the condition of your house on the day it was evaluated.

Quality assured by: MGB Energy Solutions

Visit nrcan.gc.ca/myenerguide

Natural Resources Canada / Ressources naturelles Canada

Canada

1

ENERGUIDE RATING - unique to each home, the EnerGuide rating is determined by an energy advisor registered under Natural Resources Canada's housing initiatives and working for a licenced service organization. The energy advisor assesses energy-related aspects of the home such as the home's size and structure, level of insulation and mechanical equipment. The data is assessed using energy simulation software and standard operating conditions to produce the home's EnerGuide rating. The rating is measured in gigajoules (GJ) per year. The lower the rating, the less energy you consume.

2

TOWARDS BEST ENERGY PERFORMANCE - the better the energy performance of a home, the closer to zero its rating will be. Some homes produce as much energy as they consume over the course of a year and as such they receive a rating of zero. Homes that produce more on-site renewable energy than they consume from conventional sources (e.g. natural gas, oil) are referred to as "net positive energy homes" and have a rating of 0*.

3

HOW THIS RATING WAS CALCULATED
$$102 - 28 = 74$$

102 GJ/year: the estimated amount of energy the home uses each year, largely a reflection of how the house was designed and built.

28 GJ/year: the estimated amount of energy generated annually from on-site renewable sources such as the sun and the wind.

74 GJ/year: the EnerGuide rating.

4

HOW YOUR HOME COMPARES - the EnerGuide rating of your home if built to typical new house standards¹. It shows the rating of a house with similar characteristics to yours; similar size, construction type and location. This can be used as a point of comparison for your home's rating. For example, the evaluated house on the label to the left performs 18% better than "A typical new house".

¹Your home's EnerGuide rating provides no indication of whether or not your house meets the building code.

Page 1

¹¹ <https://www2.nrcan-rncan.gc.ca/oeo/nh-mn/documents/eg/tech/EnerGuide%20Rating%20System%20Technical%20Procedures%20Version%2015.1.pdf>

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LABEL LEGEND

1 2 3 4 - refer to page 1.

5 **HOUSE ADDRESS** - the location of the rated home.

6 **DATA COLLECTED** - the date the evaluation was conducted. Modifications to the house after this date could affect its rating.

7 **FILE NUMBER** - the unique identifier that should be referred to when contacting the service organization for additional services.

8 **EVALUATED BY** - the name of the energy advisor who rated the home.

9 **ENERGUIDE RATING SCALE** - shows the EnerGuide rating of a house and "A typical new house" with similar characteristics. The better the house performs, the closer the rating is to zero. The scale is in gigajoules per year.

10 **A GIGAJOULE (GJ)** - is a unit of energy. It can be used as a measure of any type of energy that is consumed or produced in your home. Specifically, one GJ is the equivalent of 278 kWh of electricity, 27 m³ of natural gas, 26 L of oil, 39 L of propane, or 947 817 BTUs. One GJ is roughly equal to the energy from two standard barbeque propane tanks or 30 L of gas in a car's gas tank.

11 **RATED ANNUAL ENERGY CONSUMPTION** - the total amount of energy the house consumes in a year regardless of energy sources.

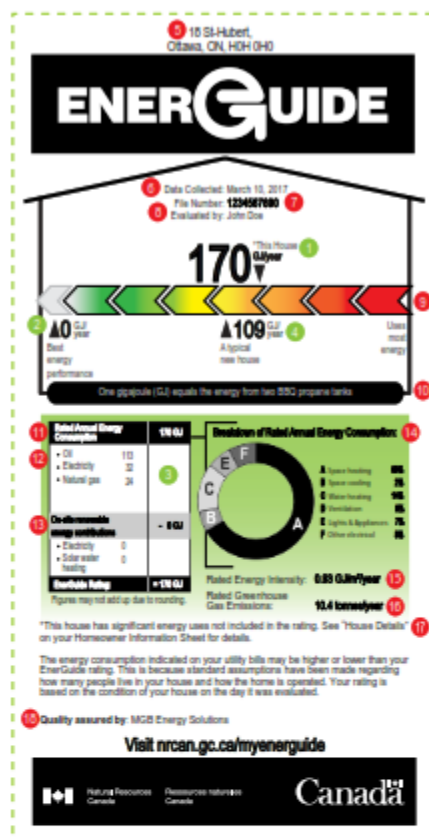
12 **ENERGY SOURCES** - the sources and amounts of conventional energy (e.g. gas, oil, electricity) that the house consumes annually. The total amount equals the rated annual energy consumption for the house.

13 **ON-SITE RENEWABLE ENERGY CONTRIBUTIONS** - the estimated annual amount of energy generated on site by renewable energy technology. This consists of solar photovoltaic and wind technology. The generated renewable energy is subtracted from the rated annual energy consumption to produce the EnerGuide rating.

14 **BREAKDOWN OF RATED ANNUAL ENERGY CONSUMPTION** - the pie-chart provides a breakdown of the major energy uses within the house and provides an initial overview of where you can lower home energy costs.

15 **RATED ENERGY INTENSITY** - is calculated by dividing the rated annual energy consumption by your home's heated floor area. It allows you to compare the annual energy use of homes of different sizes on a "per square metre" basis.

An example of a label for a lower-performing home



16 **RATED GREENHOUSE GAS (GHG) EMISSIONS** - the estimated annual amount of greenhouse gases emitted as a result of the energy used in the home.

17 **SIGNIFICANT ENERGY USES NOT INCLUDED IN THE RATING** - when an asterisk appears next to the EnerGuide rating, this identifies a house which uses significant energy for uncommon items such as a pool or hot tub. This energy use is not included in the rating. However, information on these items can be found in the House Details section of your Homeowner Information Sheet.

18 **QUALITY ASSURED BY** - the name of the service organization that quality assured the house file.

6.8 Electric Vehicle Charging Infrastructure Comparative Scan

Municipality	For new buildings
Vancouver (2018)	<ul style="list-style-type: none"> Residential-multi-family: 100% of stalls (Level 2) Residential-single-family: 100% of homes Commercial: 10% of stalls (Level 2)
Burnaby (2018)	<ul style="list-style-type: none"> All residential 100% (Level 2)
Surrey (2019)	<ul style="list-style-type: none"> Residential-all: 100% Level 2 capacity and wiring Residential-multi-family: 50% of visitor stalls Level 2 capacity Commercial: 20% Level 2 capacity
Richmond (2018)	<ul style="list-style-type: none"> Residential-multi-family: 100% of residential stalls (Level 2) Residential-single-family: 100% of residential spaces (Level 2)
Coquitlam (2018)	<ul style="list-style-type: none"> Residential-new multi-family, excluding duplex, triplex, and quadruplex: 1 residential parking space per unit must be equipped with an energized outlet capable of Level 2 charging Residential-new multi-family, excluding duplex, triplex, and quadruplex: 100% of residential parking stalls equipped with energized outlet capable of Level 2 charging (where the number of parking stalls is less than the number of units)
Township of Langley (2019)	<ul style="list-style-type: none"> Residential-SFD and multi-family: 1 energized outlet per dwelling; and minimum performance standards when EV power management software is used
New Westminster (2019)	<ul style="list-style-type: none"> Residential: Level 2 for all non-visitor parking stalls Commercial and institutional (with more than 10 stalls): 10% with Level 2
City of North Vancouver (2019)	<ul style="list-style-type: none"> Residential: 100% of parking spaces equipped with energized Level 2 outlet, except visitor spaces and secondary suites Residential-visitor parking: 20% of parking spaces (Level 2) Commercial: 20% of parking spaces (Level 2) All secure bicycle storage to include Level 1 outlets for electric bicycle charging
District of North Vancouver	<ul style="list-style-type: none"> Residential-Multi-family: 100% of residential spaces (Level 1) Commercial/industrial: 10% of stalls (Level 2)
West Vancouver	<ul style="list-style-type: none"> Residential: 100% of spaces with energized outlet capable of providing Level 2 charging
Port Moody (2019)	<ul style="list-style-type: none"> Residential: 100% of parking spaces equipped with energized Level 2 outlet, except visitor spaces, secondary suites, and new spaces to serve existing units

	<ul style="list-style-type: none"> • Commercial: Minimum 20% of stalls for commercial uses must be capable of providing Level 2 charging, except new or existing stalls for existing commercial uses • All accessible stalls must be provided with an energized outlet
District of Saanich (2020)	<ul style="list-style-type: none"> • Residential-SFD/duplex/townhome: One on-site parking space per unit to feature an energized outlet capable of providing L2 charging • Residential-multi-unit: All off-street parking spaces in multi-unit residential develops to feature an energized outlet capable of providing L2 charging, excluding visitor parking • Institutional, Commercial, and Industrial: Minimum 0-5% of stalls to be energized at time of development, depending on building type/use
Squamish	<ul style="list-style-type: none"> • 2017, Residential-multi-family: 30% of off-street parking (Level 2) • 2018, Residential-multi-family: 100% of off-street parking (Level 2)
Maple Ridge (2019)	<ul style="list-style-type: none"> • Residential-single-family/townhome/multi-plex: "Roughed in" charging infrastructure (Level 2) for 1 space per unit • Residential-apartment: "Roughed in" charging infrastructure (Level 2) for 100% of stalls plus 50% of visitor stalls • Commercial (developments with 10 or more off-street spaces): "Roughed in" charging infrastructure (Level 2) for 10% of stalls

Rebates

Funded by the BC Government and administered by BC Hydro and Fortis BC, rebates are available to residents, condo managers, strata councils and businesses to add Level 2 charging. Available rebates include:

- 50% of costs up to \$350, for the purchase and installation of a Level 2 charging station in a single-family home;
- 50% of costs, up to \$2,000 per station or \$1,000 per 208 or 240 volt outlets dedicated to EV charging (and up to \$14,000 for multiple stations), in multi-unit buildings such as condos and apartments;
- 50% of costs, up to \$2,000 per station (and up to \$14,000 for multiple stations), at eligible workplaces with at least five employees.

6.9 Maple Ridge EV Charging Infrastructure Requirements for New Development

**CITY OF MAPLE RIDGE
BYLAW NO. 7489-2018**

A Bylaw to amend the text of Maple Ridge Off-Street Parking and Loading Bylaw No. 4350-1990 as amended

WHEREAS, it is deemed expedient to amend the Maple Ridge Off-Street Parking and Loading Bylaw No. 4350-1990 as amended:

NOW THEREFORE, the Municipal Council of the City of Maple Ridge, enacts as follows:

1. This Bylaw may be cited as "Maple Ridge Off-Street Parking and Loading Amending Bylaw No. 7489-2018".
2. That Bylaw No. 4350-1990 Part 1 Interpretation, Definitions be amended by inserting the following after "1.2 d)":
 - e) Level 2 charging as defined by the SAE International's J1772 standard;
 - f) Roughed-in infrastructure means sufficient panel capacity and conduit connecting the panel to the outlet capable of providing Level 2 charging.
3. That Bylaw No. 4350-1990 Part II General Requirements be amended by deleting "2.3" and replacing with the following:

2.3 For this bylaw:

 - a) When calculation of the required number of off-street parking spaces results in a fractional parking space, one (1) off-street parking space shall be provided to meet the fractional requirement; and
 - b) When calculation of the required number of parking spaces to be provided with roughed -in infrastructure capable of providing electric vehicle charging results in a fractional parking space, one (1) off-street parking space and the corresponding electric vehicle charging requirement shall be provided to meet the fractional requirement.
4. That "Schedule "F"" is inserted following "Schedule "E"":
 - 1.0 Electric Vehicle Charging Infrastructure Requirements:
 - 1.1 For each:
 - a) One-family residential, two-family residential, triplex residential, fourplex residential, courtyard residential, Townhouse and Street Townhouse residential use, a minimum of one parking space per dwelling unit shall be provided with roughed-in infrastructure capable of providing Level 2 charging;
 - b) Apartment use, not including Townhouse, in all CD zones as well as in the RM-2, RM-3, RM-4, RM-5, RM-6, C-1, C-2, C-3, C-5, CS-1, H-1, H-2, and CRM zones, each parking space provided for residential use, excluding visitor parking spaces, shall be provided with roughed-in infrastructure capable of providing Level 2 charging;

- c) Apartment and Townhouse use in all CD zones as well as in the RM-1, RM-2, RM-3, RM-4, RM-5, RM-6, C-1, C-2, C-3, C-5, CS-1, H-1, H-2, and CRM zones, a minimum of 50% of required visitor parking spaces shall be provided with roughed-in infrastructure capable of providing Level 2 charging;
 - d) Commercial uses with 10 or more required off-street parking spaces, a minimum of 10% of the parking spaces shall each be provided with roughed-in infrastructure capable of providing Level 2 charging.
- 1.2 Energized outlets and charging stations provided pursuant to Section 1.1 above shall be installed in conformance with the B.C. Electrical Code.
- 1.3 Any visitor and commercial use parking spaces provided with charging stations shall be clearly marked "EV Charging Only" and installed in conformance with the City of Maple Ridge Sign Bylaw No.4653-1992.

5. Maple Ridge Off-Street Parking and Loading Bylaw No. 4350-1990 as amended is hereby amended accordingly.

READ a first time the 25th day of June, 2019.

READ a second time the 25th day of June, 2019.

READ a third time the 25th day of June, 2019.

ADOPTED the 23rd day of July, 2019.



PRESIDING MEMBER



CORPORATE OFFICER