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Tools for Municipal Governments in BC to Implement a Target of 100% Renewable Energy by 2050

An ELC Clinic report prepared for:
British Columbia Sustainable Energy Association

BRITISH COLUMBIA Sustainable Energy ASSOCIATION | 15 Years

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APRIL 2019

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The purpose of this report is to provide an overview of municipal jurisdiction in British Columbia to achieve 100% renewable energy commitments. It is not intended as legal advice.

Cover photos: Holly Pattison, Tom Hackney, Eric Doherty

I. Executive Summary

The purpose of this report is to provide an overview of British Columbia's municipal jurisdiction to achieve 100% renewable energy ("100% RE") commitments. In response to the threat posed by climate change and the growing movement to transition from fossil fuels, a number of municipalities on Southern Vancouver Island have committed to 100% RE by 2050. Many jurisdictions internationally, including local governments, have committed to and are striving to achieve 100% RE targets.

Municipalities may set an overall direction to achieve 100% RE in a number of planning documents. First, municipalities can use their Official Community Plans ("OCPs") as a signal of their intent to achieve 100% RE. Official Community Plans must include targets, policies, and actions for the reduction of GHG emissions, and may also include the rationale for the targets and the specific means and timelines by which the targets are to be achieved. Official Community Plans may also address energy conservation, a community energy budget and renewable energy–three critical elements of a 100% RE plan. Either adopted as part of an OCP or as a stand alone document, it is important that a municipality create a climate or energy plan to provide direction to, and communicate and mobilize support for, the 100% RE policy direction. Neighbourhood plans or local area plans–part of OCPs but specific to a particular area–can be used to pilot energy efficiency targets and actions before rolling them out to the rest of the community. Finally, a municipality may require Sustainability Checklists to encourage new developments in advancing community sustainability objectives. These can be required as part of a new development application and can be used to evaluate projects against 100% RE goals.

Municipalities also have jurisdiction for land use, density and zoning, which are effective for discouraging urban sprawl and encourage densification by zoning in such a way as to densify residences in the downtown cores and in central neighbourhoods, particularly within walking distance of public transportation corridors. Residential and commercial uses, services, schools, and other uses can also be combined in multi-use zones to enable walkable communities where people can live, work and find shopping and other services within reasonable walking distance, or within short cycling or transit distance, which can significantly reduce transportation demand. Big box stores can be avoided, and instead zoning used to encourage a greater number of smaller, distributed neighbourhood commercial areas. Municipalities may also designate areas as Development Permit Areas ("DPAs"), in which any development must receive a permit. Such a development permit may include a number of conditions, all with the intention of conserving energy or water, or reducing GHG emissions. Municipalities can use zoning and DPAs to support the Agricultural Land Reserve, and use their zoning powers to promote attached housing, which uses less energy and is a more efficient use of land.

Municipalities can impose Development Cost Charges ("DCCs") related to applications for building or subdivision permits, and may waive or reduce DCCs for certain types of developments, including small lot subdivisions and developments designed to result in low GHG emissions, to create incentives for achieving 100% RE targets. DCCs that municipalities collect may be used for off-site infrastructure designed to reduce GHG pollution, including bus lanes, bus shelters, protected bicycle lanes, marked crosswalks, and sidewalks. Municipalities may also support amenity density bonuses, which provides a higher building density within a specific zone if the developer provides amenities (for example, environmental protection, habitat restoration, and the acquisition of parkland). Pedestrian and cycling infrastructure, as well as building to green building standards or using renewable energy sources may also be considered a public amenity.

Municipalities may also create a building permit rebate program, in which rebates are offered for developments reaching higher steps in the BC Energy Step Code (BCESC), resulting in more energy efficient buildings, or greenstream (fast-track) development applications that exceed the BC Energy Step Code.

As BC's electricity stream is already close to 100% RE, the suite of tools contained in this report largely focus on the sectors where BC municipalities can have the most immediate impact: the built environment and transportation. Within the building sector, municipalities may adopt higher steps of the BCESC, requiring new buildings to meet higher levels of efficiency. Municipalities may create incentives for complying with the BCESC by offering an incentive to developers hiring an Energy Advisor to track compliance with the BCESC. They may opt into the *Solar Hot Water Ready Regulation*, or encourage new buildings to be net-zero energy buildings. They may support the establishment of district energy systems through land use planning, zoning and in setting climate targets and creating climate plans. Further, municipalities may provide incentives, such as by promoting the Revitalization Tax Exemption and the Climate Action Revenue Incentive Program to encourage developers to build to a higher standard of efficiency.

Within the transportation sector, municipalities may re-allocate road space to make non-motorized transportation more efficient, thus encouraging a switch to public transit (for example, by working with the provincial government to create bus lanes), as well as to increase the proportion of human-powered transportation (for example, by expanding sidewalks, implementing bicycling networks and establishing pedestrian plazas). Municipalities also may encourage residents to switch from gas-powered cars to electric vehicle (EVs) by requiring EV charging stations in public places and in new developments. Finally, they may encourage human-powered transportation through intentionally calibrating parking policies (as well as through the development of walkable, compact communities with local commercial areas, as discussed throughout this report).

In summary, the following tools summarize immediate action municipalities can take to achieve 100% RE:

TOOL #1: SET THE FOUNDATION FOR STRONG CLIMATE ACTION IN THE OFFICIAL COMMUNITY PLAN, INCLUDING SETTING A 100% RE TARGET AND CREATING A PLAN TO ACHIEVE THAT TARGET.

TOOL #2: DISCOURAGE URBAN SPRAWL AND ENCOURAGE DENSIFICATION THROUGH THE USE OF ZONING:

i. Zone to maximize walkability or access to most services by short cycling or transit trips;
ii. Zone to avoid big box stores or large shopping complexes that are designed to attract shoppers from a large catchment area; zone instead for smaller, distributed neighbourhood commercial;
iii. Zone for increased density within easy walking distance of frequent public transit;
iv. Separate Industrial zones and environmentally sensitive areas or watersheds;
v. Implement one or more Development Permit Areas (DPA);
vi. Zone to protect the Agricultural Land Reserve (ALR); and
vii. Zone to promote attached housing over single detached homes.

TOOL #3: CREATE INCENTIVES FOR DEVELOPERS TO BUILD ENERGY EFFICIENT AND LOWER EMISSION BUILDINGS:

i. Strategically impose and waive or reduce development cost charges (DCCs) for eligible developments;
ii. Implement amenity density bonuses;
iii. Implement building permit rebate programs; and
iv. "Greenstream" or fast-track energy efficient building applications.

TOOL #4: REQUIRE NEW DEVELOPMENTS BE BUILT TO A HIGHER STANDARD OF EFFICIENCY:

i. Reference the highest level of the BC Energy Step Code (BCESC) as soon as legally allowed; and
ii. Opt into the *Solar Hot Water Ready Regulation.*

TOOL #5: ENCOURAGE THE ESTABLISHMENT OF DISTRICT ENERGY THROUGH LAND USE PLANNING, ZONING AND IN CREATING CLIMATE PLANS.

TOOL #6: CREATE INCENTIVIZES FOR BUILDING TO A HIGHER STANDARD OF ENERGY EFFICIENCY:

i. Offer a rebate to developers hiring an Energy Advisor to track compliance;
ii. Use and promote the Revitalization Tax Exemption; and
iii. Use and promote the Climate Action Revenue Incentive Program.

TOOL #7: CREATE BEHAVIOURAL CHANGES ON THE PART OF RESIDENTS TO REDUCE THE TRANSPORTATION SECTOR'S IMPACT BY:

i. Re-allocating road space to encourage a switch to public transit (for example, creating bus lanes, where possible, on municipal roads and working with the provincial government on their roads);
ii. Increasing the proportion of human-powered transportation (for example, expanding sidewalks, bicycling networks and pedestrian plazas);
iii. Taking steps to make public transit faster and more reliable through work with BC Transit;
iv. Encouraging residents to switch from gas-powered cars to EVs by requiring EV charging stations in public places and in new developments; and
v. Encouraging human-powered transportation through intentionally calibrating parking policies.

II. Introduction & Background

The University of Victoria Environmental Law Centre (ELC) students and staff prepared this report for the BC Sustainable Energy Association (BCSEA). The purpose of this report is:

a) identifying and discussing a range of actions that are within the jurisdiction of municipalities to implement that will contribute to a goal of the initiating jurisdiction achieving 100% renewable energy by 2050 ("100% RE") for the whole municipality;
b) explaining the scope of zoning, revitalization tax exemptions, infrastructure for electric vehicle recharging, parking, and development cost charges for achieving 100% renewable energy use by 2050; and
c) providing examples of what other jurisdictions have done to this end, and what has already been done locally.

BCSEA has been working with the District of Saanich to support its October 2, 2017 adoption of the 100% RE by 2050 target. BCSEA has also advocated for 100% RE by 2050 to the City of Victoria, and Victoria adopted this target on August 18, 2016. The work with Saanich and Victoria are part of BCSEA's overall initiative to see all municipalities in southern Vancouver Island adopt this target. Central Saanich also joined Saanich and Victoria with its commitment to 100% RE in its June 2018 Climate Leadership Plan.

BCSEA sees the critical next steps for this initiative as municipal governments developing practical plans and strategies to achieve the targets. In this context, the municipalities must have a good understanding of how their existing powers can be used to further 100% RE by 2050.

The report that follows outlines how municipalities may drive the transition to 100% RE. First, it describes climate change as the impetus and rationale for the 100% RE initiative. Second, it outlines how municipalities may contribute toward the goal of 100% RE by 2050:

a) they may provide overall direction that takes into consideration 100% RE—through their Official Community Plans, Neighbourhood Plans or Local Area Plans, and through the use of sustainability checklists;
b) they may intentionally plan for population densification in central core areas and use their land use powers such as zoning with this in mind; and
c) they may tackle reducing GHG emissions from the two highest-emitting sectors in the municipal jurisdictions of southern Vancouver Island–the built environment and the transportation sector. A more general discussion of municipal jurisdiction is included in the Appendix.

Global climate change as a driver and rationale for 100% RE

Human-caused greenhouse gas (GHG) emissions are the dominant cause of global warming, which is also referred to as climate change.[1]

The central agreement directing the global community in terms of climate change mitigation, adaptation and financing is the Paris Agreement. Representatives from 196 state parties negotiated it as part of the United Nations Framework Convention Climate Change (UNFCC), and it was adopted on December 15, 2015. Its central aim is to keep "a global temperature rise this century well below 2 degrees Celsius above pre-industrial levels and to pursue efforts to limit the temperature increase even further to 1.5 degrees Celsius."[2] Canada ratified the Paris Agreement on October 5, 2016 and it entered into force on November 4, 2016.[3]

British Columbia legislated its own GHG emission reduction targets in the *Greenhouse Gas Reduction Targets Act*[4] (GGRTA), in force in January 2008, and provided *inter alia* that British Columbia's GHG emissions were to be reduced by 33% below 2007 levels by 2020, and 80% below 2007 levels by 2050.[5] The province had interim targets of six percent by 2012 and 18 percent by 2016; it met its 2012 target, but did not meet its 2016 target.[6] The provincial government acknowledged that it would not meet its legislated 2020 target,[7] and in May 2018 amended the GGRTA with Bill 34: *Greenhouse Gas Reduction Targets Amendment Act, 2018*. Bill 34 repealed the targets in the GGRTA and provides a new target of 40% below 2007 levels by 2030, a 60% reduction by 2040, and an 80% reduction by 2050.[8] It also renamed the GGRTA the *Climate Accountability Act*.[9]

If humanity is to avoid "catastrophic global warming" and have any chance of getting close to the Paris Climate Agreement's goal of limiting global average temperatures to 1.5°C above pre-industrial levels,[10] global GHG emissions must be radically reduced. A rapid and comprehensive global transition from fossil

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[1] See for example, Intergovernmental Panel on Climate Change, "Climate Change 2014: Synthesis Report" (2015), online: <https://www.ipcc.ch/report/ar5/syr/>. See also Government of Canada, Canada's Changing Climate Report (2019), online: <https://www.nrcan.gc.ca/sites/www.nrcan.gc.ca/files/energy/Climate-change/pdf/CCCR_FULLREPORT-EN-FINAL.pdf>.
[2] United Nations Climate Change, "The Paris Agreement" (updated 3 July 2018; accessed 17 September 2018), online: <https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement> ["*Paris Agreement*"].
[3] Government of Canada, "Paris Agreement" (modified 6 January 2016; accessed 17 September 2018), online: <https://www.canada.ca/en/environment-climate-change/services/climate-change/paris-agreement.html>.
[4] SBC 2007, c 42.
[5] *Ibid*, at s 2(1).
[6] BC Government, "Climate Planning & Action" (accessed 17 September 2018), online: <https://www2.gov.bc.ca/gov/content/environment/climate-change/planning-and-action>.
[7] Mike Laanela, "B.C. government drops greenhouse gas target for new 2030 goal" (8 May 2018; accessed 19 September 2018), online: CBC News <https://www.cbc.ca/news/canada/british-columbia/b-c-government-drops-greenhouse-gas-target-for-new-2030-goal-1.4653075>.
[8] BC Government, "News Release: New bill updates targets for reducing carbon pollution" (8 May 2018; accessed 19 September 2018), online: <https://news.gov.bc.ca/releases/2018ENV0021-000860>.
[9] Bill 34: Greenhouse Gas Reduction Targets Amendment Act, 2018 (passed third reading 17 May 2018; accessed 19 September 2018), online: <https://www.leg.bc.ca/parliamentary-business/legislation-debates-proceedings/41st-parliament/3rd-session/bills/third-reading/gov34-3>.
[10] T W Brown et al, "Response to 'Burden of proof: A comprehensive review of the feasibility of 100% renewable-electricity systems'" (2018) 92 Renewable & Sustainable Energy Reviews 834 at 834 ["*Brown et al*"]; see also *Paris Agreement,* see note 2, art 2, cl 1(a).

fuels[11] to renewable energy sources[12] is necessary to mitigate climate change's negative environmental, economic, and human health effects.[13] A rapid and far-reaching transition in energy and land use is required; this includes in building and transport infrastructure and use–areas in which local governments have jurisdiction. In fact, the October 2018 Intergovernmental Panel on Climate Change (IPCC) report provides that the depth of emission reductions in the transport and buildings sectors could be enough to make up the difference in achieving a 1.5 degree warming rather than a 2 degree warming.[14] The IPCC has acknowledged that the scale at which this global transition from fossil fuels is required is unprecedented in human history; however, the required speed of transition *has* been seen in specific sectors.[15]

Over the past decade, a global movement advocating for 100% RE has been gaining momentum. First proposed in 1975,[16] the idea of powering cities, regions, countries, and ultimately the entire planet with 100% RE "can be seen as a positively stated equivalent to eliminating" GHG emissions.[17] The 100% RE movement "envisions an entirely renewable power base for the global economy", and "encourages governments, business, cities and communities" to abandon piecemeal programs and fractional emissions targets in favour of a specific and concrete target.[18] 100% RE applies to electricity generation, heating/cooling systems, and transportation,[19] and is distinct from weaker 'carbon neutrality' goals, which often rely on emissions trading schemes that allow significant global GHG pollution to continue.[20]

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[11] In 2015, 73% of Canada's total primary energy supply and 81% of the world's total potential energy supply was generated by GHG-emitting fossil fuels: see Natural Resources Canada, 'Energy and Greenhouse Gas Emissions (GHGs) (4 January 2018), online: <www.nrcan.gc.ca/energy/facts/energy-ghgs/20063>.

[12] This category typically includes wind, solar, and water power (hydro and tidal), as well as geothermal energy and low-GHG biofuels. 100% RE transition plans sometimes limit their reliance of hydroelectricity and biofuels due to the potentially severe environmental and social impacts of these fuels. Nuclear energy is generally excluded from the renewable energy category due to the significant environmental dangers it poses: see, for example, Mark Z Jacobson, "Roadmaps to Transition Countries to 100% Clean, Renewable Energy for All Purposes to Curtail Global Warming, Air Pollution, and Energy Risk" (2017) 5 Earth's Future 948 at 949 ["*Jacobson*"]; see also World Wildlife Fund, *The Energy Report* (2011) at 19, 31-40, online: <https://www.worldwildlife.org/publications/the-energy-report> ["*WWF Energy Report*"]; Jacqueline Langwith, "What is Renewable Energy? Chapter Preface" in Jacqueline Langwith, ed, *Renewable Energy* (Farmington Hill, MI: Greenhaven Press, 2009) 19 at 20; Al Gore, "Renewable Energy is Necessary to Reduce Global Warming" in Langwith, ed, *Renewable Energy* at 72.

[13] On the necessity of a rapid transition to renewable energy sources, see, for example, WWF, *Energy Report,* see note 5 at 13-20; Peter Droege, "100 Renewable Energy: The Essential Target" in Peter Droege, ed, *100% Renewable: Energy Autonomy in Action* (London: Earthscan, 2009) at 8-9 ["*Droege*"].

[14] Intergovernmental Panel on Climate Change, "Global Warming at 1.5°: an IPCC special report on the impacts of global warming of 1.5 °C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty, Summary for Policy Makers" (6 October 2018; accessed 10 October 2018), at C2.4 (PDF pp 22-23), online: <http://report.ipcc.ch/sr15/pdf/sr15_spm_final.pdf>.

[15] *Ibid*, see note 15, at C2.1 (PDF p 22).

[16] Bent Sørensen, "Energy and Resources" (1975) 189:4199 Science 255.

[17] Thomas Hackney, "100% Renewable Energy by 2050 Pathway for the District of Saanich: Report to the Corporation of the District of Saanich" BC Sustainable Energy Association (27 February 2017) at 9, online: BC SEA <https://www.bcsea.org/sites/bcsea.org/files/2017-02-27_-_saanich_100_re_pathway_-_bcsea_-_final.pdf> ["*Hackney 100% RE Pathway Report"*].

[18] *Droege*, see note 13 at 1, 6, 11.

[19] Global 100% RE, "The Idea", online: <www.go100re.net/about-us/the-idea/>.

[20] On the perils of emissions trading, see, for example, *Droege*, see note 13, at 21. For a local example, see the BC Climate Action Toolkit's Carbon Neutral Local Government initiative, which encourages municipalities to reduce and then "balance [their] remaining emissions through the purchase of carbon offsets and/or through investments in local GHG reduction projects". Copenhagen, Denmark appears to be taking a more robust approach to carbon neutrality, by offsetting any ongoing

In 2011, the World Wildlife Fund proposed worldwide 100% RE by 2050, and released a comprehensive analysis showing that over the next 40 years it was technically possible to reach 100% RE.[21] Stanford academic Mark Jacobson has since proposed "roadmaps to transition 139 countries" that aims to use renewable wind, water and solar power for all energy purposes to reduce 99% of global GHG emissions by 2050.[22] The 100% RE systems being proposed in the growing body of literature on this topic are cost competitive with fossil-fuel-based systems, and capable of meeting citizen energy needs under most circumstances.[23] As of 2018, Iceland and parts of Germany, New Zealand, Scotland, and Denmark are already "at or above 100%" RE electricity, while Paraguay, Norway, and Uruguay are at or above 95%.[24] Online platforms like Global 100%RE are creating a global network of regions that have achieved or are working towards 100% RE, providing support and sharing best practices, and initiating dialogue to make 100% RE a viable approach and "the new normal."[25]

Although the ultimate goal is 100% RE on a global scale, much of the movement's meaningful progress to-date has occurred at the local level,[26] where local governments have the power to make a significant difference.[27] Indeed, any solution to climate change must rely on local governments because cities are responsible for 37-49% of global GHG emissions, and urban infrastructure uses over 70% of global energy.[28] In Canada, local governments have influence over approximately 50% of Canada's total GHG emissions,[29] and in BC, municipalities have jurisdiction over approximately half of all carbon emissions.[30] With jurisdiction over local policy, services, and infrastructure,[31] local governments here and around the world are well-situated to lead community-wide efforts to address local GHG emissions and energy use impacts by working towards 100% RE.

Recognizing this potential, Global 100%RE and International Council for Local Environmental Initiatives (ICLEI)–Local Governments for Sustainability launched the 100% Renewable Energy Cities & Regions Network, "a global community of practice" for cities, towns, and regions that have voluntarily

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emissions within municipal boundaries through the production of excess RE for use outside the municipality by 2025. See BC Climate Action Toolkit, "Carbon Neutral Local Government", online: <toolkit.bc.ca/cnlg>; Tue Damsø, Tyge Kjær & Thomas Budde Christensen, "Implementation of local climate action plans: Copenhagen – Towards a carbon-neutral capital" (2017) 167 J of Cleaner Production 406 at 408.

[21] *WWF Energy Report,* see note 12, at 11.

[22] *Jacobson*, see note 12, at 949.

[23] *Brown et al*, see note 10, at 842.

[24] *Ibid*.

[25] Global 100% RE, "About Us", online: <www.go100re.net/about-us/>.

[26] For example, approximately 50 German municipalities had reached 100% RE by early 2012. See Henner Busch & Kes McCormick, "Local power: exploring the motivations of mayors and key success factors for local municipalities to go 100% renewable energy" (2014) 4:5 Energy, Sustainability & Society at 1.

[27] Maryke van Staden, "Sustainable Energy Transition: Local Governments as Key Actors" in Tanay Sidki Uyar, ed, *Towards 100% Renewable Energy: Techniques, Costs and Regional Case-Studies* (Springer International Publishing, 2017) 17 at 17 ["*van Staden*"].

[28] *Ibid* at 18, 20.

[29] Big City Mayors' Caucus, "Climate Change and Resilience", online: <www.citiescan.ca/climate_change>.

[30] Renewable Cities, "Event: B.C.'s Climate Plan and the Urban Opportunity" (9 February 2018), online: <https://www.renewablecities.ca/events/public-dialogue-british-columbias-climate-plan-and-the-urban-opportunity>. In 2015, 56% of BC's emissions were produced by the transportation sector and the built environment (including waste): see BC, "Provincial Greenhouse Gas Inventory", online: <https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory> ["*BC, GHG Inventory*"].

[31] *van Staden*, see note 27, at 20.

committed to achieving 100% RE.[32] In order to join this network, a local or regional government must have approved a 100% RE target in at least one sector or are examining it for their territorial jurisdiction.[33] Here in BC, the District of Saanich and the City of Vancouver have joined the Cities & Regions Network,[34] and the City of Victoria, Saanich, and Vancouver are all participating in the broader Global 100% RE Network.[35]

Other international signatories to the 100% RE initiative include: Aspen, USA (which already reached its target); Australian Capital Territory, Australia; Jeju, South Korea; Malmo, Sweden; and San Jose, Costa Rica. This is just a handful among a growing list of other municipalities committing to the cause. In September 2018 the state of California committed to generating 100% of its electricity from renewable sources by 2045.[36]

Vancouver has set 100% RE targets for buildings and transportation by 2050.[37] In 2016 the City of Victoria committed to reducing community-wide GHG emissions by 80% (of 2007 levels) by 2050, and to shift away from fossil fuels to 100% RE by 2050. Victoria's Climate Leadership Plan proposes a 2050 100% RE target for "all energy used within Victoria's municipal boundaries."[38] The District of Saanich has assessed the feasibility of making all municipal buildings 100% RE by 2025,[39] and has now committed to a 2050 100% RE target for the whole community, not just municipal operations (as has the District of Central Saanich).[40] For the other 184 local governments[41] that have signed the *BC Climate Action Charter*,[42] setting community-wide 100% RE targets in multiple sectors and taking decisive action to achieve them is the logical next step towards truly meaningful climate action. BCSEA proposes that all municipalities in the CRD commit to reaching 100% RE in all sectors across the entire community by 2050. This report therefore lays out concrete actions that municipalities can take to help make this vision a reality. While there is much that municipalities can do, it is important to note that action on the

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[32] ICLEI – Local Governments for Sustainability, "100% Renewable Energy Cities & Regions Network", online: <www.iclei.org/activities/agendas/low-carbon-city/iclei-100re-cities-regions-network.html> ["*ICLEI Network*"].

[33] *Ibid.* Member governments may set community-wide 100% RE targets for electricity, heating/cooling, and/or transport (as Vancouver has done), or set a narrower 100% RE target that only applies to local government operations (as Calgary has done):see *ibid,* Frequently asked questions: "What different types of 100% RE targets do cities, towns and regions set?"

[34] Global 100%RE, "Map", online: <www.go100re.net/map/>.

[35] *ICLEI Network*, see note 32.

[36] Environment California, "News Release: Gov. Jerry Brown energizes fight to stall climate change, signing California's 100% clean electricity bill into law" (10 September 2018), online: <https://environmentcalifornia.org/news/cae/gov-jerry-brown-energizes-fight-stall-climate-change-signing-california%E2%80%99s-100-clean>.

[37] Vancouver, *Renewable City Strategy* (November 2015), online: <vancouver.ca/files/cov/renewable-city-strategy-2015.pdf>.

[38] Victoria, "2018 Climate Leadership Plan" (2018; accessed 20 December 2018), at 8, online: <https://www.victoria.ca/assets/Departments/Engineering~Public~Works/Documents/City%20of%20Victoria%20Climate%20Leadership%20Plan%20(1805).pdf>.

[39] *ICLEI Network*, see note 32, "Meet some of the participants – Saanich, Canada".

[40] *100% Renewable & Resilient Saanich: Climate Plan Backgrounder*, District of Saanich, November 2018 (p. 7) <https://www.saanich.ca/assets/Community/Documents/Planning/sustainability/Climate%20Plan%20Backgrounder%20Document%20November%2019%202018%20smaller.pdf>. The District of Central Saanich has also made the 100% RE commitment: District of Central Saanich website: *Read and Offer Feedback on the Draft Climate Action Plan*, June 2018. https://www.centralsaanich.ca/our-community/news/read-and-offer-feedback-draft-climate-leadership-plan)

[41] British Columbia, "Local Governments & Climate Action", online: <https://www2.gov.bc.ca/gov/content/environment/climate-change/local-governments>.

[42] *The British Columbia Climate Action Charter* (2007), online: <https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/local-governments/planning-land-use/bc_climate_action_charter.pdf>. Signatory local governments have agreed to take action to reduce GHG emission and create complete, compact, energy efficient communities.

transition to 100% RE at all levels of government is important as municipalities are limited to acting within their jurisdiction, as described at part III, section A, below.

As British Columbia's electricity stream is already close to 100% RE,[43] the suite of tools contained in this report largely focus on the built environment and transportation–the sectors where BC municipalities can have the most immediate impact.[44] To aid in the selection of what tools will be most effective, municipalities should start their transition to 100% RE by developing a climate action or 100% RE plan that involves significant public engagement and support.

III. Issues, Measures and Legal Tools

Municipalities derive their authority from the *Community Charter* and the *Local Government Act*, which enable them to:

1. Provide services;
2. Regulate, prohibit or impose requirements in specific areas of jurisdiction, including land use, buildings, the protection of the environment, and business;
3. Administer themselves, which includes making choices about their own operations that emit GHGs.

Under the second power listed above, municipalities may provide for a system of licenses, permits, or approvals and may include terms and conditions on a license, permit, or approval. It may also adopt a standard, code or rule. See the Appendix for further description of municipal jurisdiction.

A. Local Governments' Ability to Set Overall Direction

i. Official Community Plans

The *Local Government Act* (*LGA*) authorizes municipalities to establish Official Community Plans (OCPs).[45] OCPs are plans that are adopted through bylaws and that state objectives and policies to be used in guiding decisions on planning and land use within the area of the OCP.[46] After the adoption of an OCP, all bylaws and works within that area must be consistent with the OCP.[47]

OCPs can address aspects of the community development such as land use and density, transportation, environmentally sensitive areas, housing needs, regulation of development, and–most significantly as a tool for reaching 100% RE–they must include targets, policies, and actions for the reduction of GHG

[43] *Clean Energy Act*, SBC 2010, c 22, s.2(c) commits BC to "generate at least 93% of the electricity in British Columbia from clean or renewable resources". As of August 2016 BC Hydro was generating 98% of its power from clean or renewable resources: Government of British Columbia, *Climate Leadership Plan* (August 2016), at 28, online: <https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/clp/clp_booklet_web.pdf>.
[44] This includes only "territorial" emissions, and not the "consumption based" emissions of products imported into the jurisdiction (i.e. food and other supplies). Consumption based emisions are beyond the scope of this report.
[45] *Local Government Act,* RSBC 2015, c 1, ss.475-479 ["*LGA*"].
[46] *Ibid*, s. 471(1).
[47] *Ibid*, s.478(2).

emissions.[48] While the *LGA* does not require an OCP to have an actual plan for GHG reduction in the sense of a connected series of intended actions that would actually achieve the GHG reduction targets, a municipalicy could include such a plan in its OCP. Likewise, there is no requirement in the *LGA* for an OCP to address energy conservation, a community energy budget or renewable energy–three critical elements of a 100% RE by 2050 plan, however a municipality could choose to include such a plan in its OCP.

Integrating a 100% RE plan directly into OCPs is one way that municipalities can send a clear signal of intent regarding the seriousness with which they are addressing the issue of GHG emissions and climate change. Municipal governments that are committed to achieving climate action and/or 100% RE targets can and should create formal plans to achieve these targets. In addition to the bare bones requirement of the OCP to specify targets, policies and actions, a proper plan would also include the reasons for the targets, the specific means and timelines by which the targets are to be achieved, and other related information.

The policies specified in the plan should be those that are necessary and sufficient to achieve the goals, and may include policies for infrastructure, land use, housing types, and green spaces. For example, an OCP may encourage attached housing rather than single detached homes (even specifying a specific percentage of new development that must be attached or multi-family units), clustering development, the use of public transportation, and densification in centralized core areas.

A key benefit of producing a plan is that it enables the municipality and others to understand the extent of the measures that are needed to achieve the targets, and the extent to which any particular measure or strategy will contribute to the achievement of the targets. This can help with planning (i.e. identifying which measures will be needed and what they must contribute to achieving the targets) and also with communication with citizens, businesses, other levels of government and other interested persons. For example, the City of Victoria's *Climate Leadership Plan*[49] is the focal document explaining its climate action and energy targets.

Whether adopted as part of an OCP or as a stand alone document, a climate or energy plan may have no particular legally enforceable requirements, but it can still play a critically important role for providing direction to and, communicating and mobilizating support for, the policy direction.

[48] *Ibid*, ss.473-474.
[49] City of Victoria "Climate Leadership Plan" (2018), online: <https://www.victoria.ca/assets/Departments/Engineering~Public~Works/Documents/City%20of%20Victoria%20Climate%20Leadership%20Plan%20(1805).pdf>.

Example of an OCP setting the Foundation for 100% RE:

Victoria has drafted an OCP and Strategic Plan outlining its goals for more electric vehicles, transitioning to more efficient heating systems, steps for efficiency improvements, renewable transport additions, supporting district energy, and density incentives for buildings in the downtown core.[50] The OCP is open to the public and the implementation strategy for the OCP goes through an annual review.[51]

Victoria's 2018 Climate Leadership Plan states:

This Climate Leadership Plan (CLP) is the City's first attempt to comprehensively size-up and begin delivering on its climate and energy commitments… The result is a comprehensive assessment of Victoria's GHG emissions and sector-specific plans for tackling them.

The CLP calls for a transformation of how we use and manage energy, from heating and powering our homes and buildings to how we power our automobiles and dispose of our waste. It is an action plan to drastically improve energy efficiency, because doing more with less energy is the cheapest way to cut carbon emissions. It is also a plan to use low carbon energy to provide the remaining energy needed to support our daily quality of life.[52]

ii. Neighbourhood Plans or Local Area Plans

Part of OCPs, creating neighbourhood plans or local area plans are a strategy for planning the development of a specific area within a community. These plans can be used as a way to pilot new energy efficiency targets and actions, such as a commitment to attached dwelling forms, within a smaller area before rolling them out to the rest of the community.

iii. Sustainability Checklist

A Sustainability Checklist (SC) is a non-regulatory tool that can be used to encourage new developments to advance community sustainability objectives. The purpose of an SC is to encourage new developments to support sustainability objectives. Although they are non-regulatory tools, they can be used to evaluate projects and identify those that meet certain sustainability goals. Municipalities can require that SCs be included as part of an application for new development. An item to include in an SC related to the achievement of 100% RE is that the development will use renewable energy (electricity)– rather than fossil fuels for space and water heating.

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[50] City of Victoria, *Official Community Plan* (July 2012; updated 4 October 2018), online: <https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/OCP/Replaced/OCP_whole_book_Oct4-2018-web.pdf>.

[51] City of Victoria, "OCP Implementation & Annual Review" (accessed 27 November 2018), online: <https://www.victoria.ca/EN/main/residents/community-planning/official-community-plan/implementation-and-annual-review.html>.

[52] City of Victoria, Climate Leadership Plan (2018; accessed 27 November 2018), at 8, online: <https://www.victoria.ca/assets/Departments/Engineering~Public~Works/Documents/City%20of%20Victoria%20Climate%20Leadership%20Plan%20(1805).pdf>.

Example of a Sustainability Checklist:

> Starting January 1, 2019, under the "Transportation Demand Management for Developments in Vancouver" administrative bulletin, certain developments must accumulate a certain number of TDM "credits" in order to be built. Developers can receive credits for a variety of measures, including reducing total parking supply, requiring users to pay for parking, providing carshare vehicle parking and transit passes to building occupants, and increasing bicycle parking over what is required by by-law.[53] This list of demand management measures acts as a form of sustainable transportation checklist.

TOOL #1: SET THE FOUNDATION FOR STRONG CLIMATE ACTION IN THE OFFICIAL COMMUNITY PLAN, INCLUDING SETTING A 100% RE TARGET AND CREATING A PLAN TO ACHIEVE THAT TARGET.

B. Land Use, Density and Zoning

Urban sprawl is a major driver of energy use and, to the extent that burning fossil fuels is used to meet that energy demand, GHG emissions. Also, urban sprawl is costly to municipalities:

> *Households and businesses in low density or distant areas generally cost municipal governments more to service than those located in compact, complete communities. Municipalities face higher costs for building initial infrastructure, such as roads and water mains, and for ongoing services, such as fire and police protection, school buses, and solid waste pickup. In many municipalities, fees and charges for these services are based on the city-wide average cost of providing the services. In these cases, people living in higher density areas and near the city core overpay their share, ultimately subsidizing the development of new suburbs.*[54]

A key sustainability action is to reduce the expansion of low density areas, and densify core areas. This maximizes infrastructure and amenity dollars, and allows that money to be directed to the higher density core (which can fund initiatives to assist with the transition to 100% RE, such as bicycle paths and electric vehicle (EV) stations), and will ultimately lead to those in the city's core using more public transit and human-powered transportation—all important steps in the path to 100% RE.

i. Zoning

Municipal governments have significant authority to support 100% RE through zoning as it enables almost complete control over land use, exercised through zoning and other bylaws. The power to zone

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[53] City of Vancouver Planning By-law Administration Bulletins, "Transportation Demand Management for Developments in Vancouver" (August 2018; accessed 22 October 2018), online: <https://vancouver.ca/files/cov/transportation-demand-management-for-developments-in-vancouver.pdf> ["*Vancouver TDM Admin Bulletin*"].

[54] R. Jacobs and D. Curran "Local Government Tools for Addressing Sprawl: Jurisdiction" (Environmental Law Centre, University of Victoria, June 2014), at 6.

land for particular uses, and regulate certain land use activities within these zones, is provided to local governments under section 479 of the *LGA.*[55]

Zoning works in two basic ways: (a) by mandating whether and where different land uses can occur, and how different uses are separated or allowed to co-exist, which has a huge influence on the demand for transportation (i.e. how far people need to travel to get from home to work and services); and (b) by determining the density of buildings within each specified zone, which has a significant influence on the energy efficiency of buildings as attached building forms are generally more energy efficient per unit.

Local governments can discourage urban sprawl and encourage densification by zoning in such a way as to densify residences in the downtown cores and in central neighbourhoods, particularly within walking distance of public transportation corridors. Residential and commercial uses, services, schools, and other uses can also be combined in multi-use zones to enable walkable communities where people can live, work and find shopping and other services within reasonable walking distance, or within short cycling or transit distance, which can significantly reduce transportation demand.

Municipalities can also control where wholesale and retail outlets are allowed to be built in relation to population centres. “Big box” stores and large shopping centres are planned on the concept of attracting large numbers of customers from a wide region, effectively requiring those customers to travel long distances, typically in personal motorized vehicles. This maximizes the amount of transportation resources (roads, vehicles and manufacture of vehilces, energy) needed to provide goods to a population, and it therefore makes it more difficult to achieve 100% RE objectives. Alternatively, larger numbers of smaller retail outlets serving local neighbourhoods, where transportation needs can be served by walking and biking minimize the roads, vehicles and energy needed to deliver goods to market.

ii. Development Permit Areas

A municipality may designate a Development Permit Area (DPA) for a specific purpose under section 488 of the *LGA*,[56] and specifically for the purposes of achieving 100% RE,[57] the protection of the natural environment, the promotion of energy conservation or water conservation, and the reduction of GHG emissions.[58] Proposed development within a DPA requires a special permit. Land that is designated for natural environment protection, for energy or water conservation, or GHG emission reduction cannot be altered unless the municipality issues a permit.[59]

For DPAs designated for the protection of the natural environment, development permits may: specify areas of land that must remain free of development; require specified natural features that must be preserved or restored; require natural water courses be dedicated; require works be constructed to

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[55] *LGA*, see note 45. Limitations on this power are that zoning cannot regulate provincial lands, federal lands, or Indian Reserves, nor can it regulate provincial and federal highways.
[56] *Ibid*, s.488.
[57] For examples on how using DPAs can help to reach 100% RE, see BC Ministry of Community, Sport, and Cultural Development, “Development Permit Areas for Climate Action” (November 2011), online: <https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/local-governments/planning-land-use/development_permit_areas_climate_action_guide.pdf>.
[58] *LGA*, see note 45, s.488(1).
[59] *Ibid*, s.489.

preserve natural features or water courses; and require protection measures, including the planting of trees or other vegetation, to control drainage, control erosion of protected banks, or protect fish or riparian areas.[60]

For land within a DPA designated for energy or water conservation or for GHG emission reduction, development permits may include requirements respecting landscaping, the siting of buildings and other structures, the form and exterior design of buildings and other structures, specific features in the development, and machinery, equipment and systems – all with the intention of conserving energy or water, or reducing GHG emissions.[61] The development permits may also establish restrictions on the type and placement of trees and other vegetation in proximity to the buildings and other structures.[62]

A municipality can blanket DPAs across a large proportion of the municipality, as long as it provides a valid justification for doing so.

Example of using a DPA to reduce GHG Emissions:

> The District of North Vancouver has a Energy, Water, and Greenhouse Gas DPA that is intended to reduce energy and water consumption in new buildings, create positive impact on the natural environment, make the best possible use of existing infrastructure systems, reduce operation and maintenance costs, and encourage innovation in building design and development.[63]

iii. Zoning to Protect the Agricultural Land Reserve

The British Columbia government has established the ALR to protect agricultural land and farming.[64] Agricultural use is prioritized and non-farm use is restricted on ALR land. The *Farm Practices Protection (Right to Farm) Act*[65] prohibits local governments from interfering with "normal farm practices"[66]; however, local governments can support the ALR and its purposes through the use of DPAs, as well as zoning. Both can be used to shape the location of farm buildings, ancillary activities such as parking, and commercial uses in favour of green infrastructure values,[67] and direct urban-type development away from rural and farming areas.

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[60] *Ibid*, s.491(1).
[61] *Ibid*, s.491(9). Note that these matters are prescribed for the purposes of the *Building Act* to be unrestricted matters (so the local government is not limited to referencing the BCESC in regulating them) (per *Building Act General Regulations*, 131/2016, s 2(e) ["*Building Act General Regulation*"]).
[62] *LGA*, see note 45, s.491(10).
[63] The District of North Vancouver, "Energy, Water, and Greenhouse Gas Development Permit Area (DPA)" (accessed 22 October 2018), online: <https://www.dnv.org/property-development/energy-water-and-greenhouse-gas-development-permit-area-dpa>.
[64] *Agricultural Land Commission Act*, SBC 2002, c 36.
[65] RSBC 1996, c 131.
[66] *Ibid*, at s.1.
[67] Deborah Curran, Environmental Law Centre, University of Victoria "Green Bylaws Toolkit: for Conserving Sensitive Ecosystems and Green Infrastructure" (revised and updated April 2016), at 306, online: <http://www.greenbylaws.ca/documents/GreenBylawsToolkit_2016.pdf> ["*Green Bylaws Toolkit*"].

iv. Zoning to Promote Attached Housing

Local governments can use their zoning power to require areas to have a certain percentage of attached housing. They can establish comprehensive development zones to ensure units are clustered on a property in order to conserve sensitive ecosystems and greenspace (conservation covenants would be placed on the preserved area).[68] Municipalities may also provide for development cost charges (DCCs) and amenity density bonuses to encourage developers to build denser, attached housing (see the following two subsections, below). These tools are often combined to allow a developer to build to higher densities than would otherwise be permitted under the standard zoning while clustering development away from ecologically sensitive areas.

Example of using Zoning to promote 100% RE Cities:

The District of Highlands zoned one area in the District as Intensive Residential Land Use. In this area, the OCP encourages clustering of housing, incorporating natural features into developments, the retention of habitat, and designs that support the use of public transport and human-powered transportation.[69]

The City of Minneapolis, Minnesota in the United States eliminated single-family zoning to allow for attached housing (with at least up to three units per dwelling) in every area of the City.[70] In addition to addressing climate change, the decision was also to improve access to affordable housing and address racial equity.

TOOL #2: DISCOURAGE URBAN SPRAWL AND ENCOURAGE DENSIFICATION THROUGH THE USE OF ZONING:

i. Zone to maximize walkability or access to most services by short cycling or transit trips;
ii. Zone to avoid big box stores or large shopping complexes that are designed to attract shoppers from a large catchment area; zone instead for smaller, distributed neighbourhood commercial;
iii. Zone for increased density within easy walking distance of frequent public transit;
iv. Separate Industrial zones and environmentally sensitive areas or watersheds;
v. Implement one or more Development Permit Areas (DPA);
vi. Zone to protect the Agricultural Land Reserve (ALR); and
vii. Zone to promote attached housing over single detached homes.

[68] *Ibid*, at 75.
[69] District of Highlands Official Community Plan, Schedule A to Bylaw No 227 (replaced by Bylaw 360 in November 2013), at s 21 (at pp 21-22), online: <https://www.highlands.ca/DocumentCenter/View/4080/Official-Community-Plan---Schedule-A---2013?bidId=>.
[70] Sarah Mervosh, "Minneapolis, Tackling Housing Crisis and Inequity, Votes to End Single-Family Zoning" (13 December 2018), online: New York Times <https://www.nytimes.com/2018/12/13/us/minneapolis-single-family-zoning.html>.

i. Development Cost Charges

Municipalities have the authority to implement and collect DCCs under the *LGA*.[71] DCCs are a one-time charge for new development for providing, constructing, altering or expanding sewage, water, drainage and highway facilities, and for providing and improving park land—all of which services, directly or indirectly, the development for which the charges are being imposed.[72]

Municipalities can, by bylaw, impose DCCs on every person who obtains a building construction or alteration permit, or a permit approving a subdivision.[73] They may waive or reduce DCCs for certain types of developments, including small lot subdivision designed to result in low GHG emissions, and for developments designed to result in low environmental impacts.[74] Eligible developments for which DCCs may be reduced or waived are described in section 563 of the *LGA*, and for the purposes of achieving 100% RE, c and d below are relevant:

a) not-for-profit rental housing, including supportive living housing;
b) for-profit affordable rental housing;
c) a subdivision of small lots that is designed to result in low greenhouse gas emissions;
d) a development that is designed to result in a low environmental impact.[75]

The municipality must establish what constitutes an eligible development by bylaw, and must establish the rates of reduction for eligible developments—which may be different for different categories of eligible development.[76] They may also establish the requirements to obtain a waiver or reduction.[77]

The *LGA* also allows municipalities to vary DCCs by density of use. Using development density as a factor in setting DCC rates can encourage developers to build projects with a higher rate of living units per area, which usually means attached and multi-family structures instead of detached housing,[78] and, ultimately, more energy efficient styles of building.

Another means of promoting efficiency through DCCs is to increase the importance of a development's location as a factor in setting rates. Lowering DCCs in core areas may encourage developers to build more densely and efficiently, and more accurately reflects the cost that the development imposes on the municipality to provide services.[79]

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[71] *LGA,* see note 45, at s. 559.
[72] *Ibid*, at s. 559(2).
[73] *Ibid*, at s. 559(1).
[74] *Ibid*, at ss. 563 & 564.
[75] *Ibid*, at s. 563(1).
[76] *Ibid*, at s. 563(3).
[77] *Ibid*, at s. 563(3).
[78] Coriolis Consulting Group "Do Development Cost Charges encourage smart growth and high performance building design?" Report prepared for West Coast Environmental Law (September 2003), online: WCEL <https://www.wcel.org/sites/default/files/publications/Do%20development%20cost%20charges%20encourage%20smart%20growth%20and%20high%20performance%20building%20design%20An%20evaluation%20of%20development%20cost%20charge%20practices%20in%20British%20Columbia%20-%20Summary.pdf>.
[79] *Ibid*.

Example of using DCCs to promote 100% RE Cities:

Nanaimo's downtown core ("Old City Neighbourhood") is exempt from DCCs. Prince George, Penticton and the District of Sooke all set lower DCC rates for their downtown cores. These initiatives support 100% RE by encouraging development in areas where there is lower infrastructure capital costs—areas that are centrally located, higher density and more energy efficient.[80]

The City of Penticton grants DCC reductions of 50-100% for eligible green developments, and the City of Powell River completely exempts LEED gold or platinum and green building category developments from DCCs.[81]

Municipalities can also vary DCCs to encourage development of buildings that meet a certain sustainability standard, and can reduce DCCs for developments proposing district energy systems. This approach could be applied in conjunction with the BC Energy Step Code ("BCESC") to encourage developers to build to a higher standard of energy efficiency (discussed further under part III, section C, subsection i, below).

Though much of the DCC funds spent in recent decades have gone to urban roadway expansion, which generally *increases* fossil fuel consumption and GHG pollution, DCCs can also be used for off-site infrastructure designed to reduce GHG pollution. This infrastructure includes bus lanes, bus shelters, protected bicycle lanes, marked crosswalks, and sidewalks.

Tips for municipalities when implementing DCCs:

1. Re-direct DCCs to infrastructure that reduces GHG pollution, such as sidewalks, pedestrian facilities, bicycle infrastructure, and transit provisions such as bus bulges;[82]
2. Reduce DCCs in specific areas to encourage development of compact, complete, transit supportable communities;
3. Vary DCC rates based on density of developments;
4. Reduce DCCs for developments that meet a certain sustainability standard, such as using renewable energy (electricity) rather than fossil fuels for space and water heating, and complying with a higher level in the BCESC; and
5. Reduce DCCs for developments proposing district energy systems using renewable energy (electricity) rather than fossil fuels.

[80] BC Climate Action Toolkit, "Development Cost Charges" (accessed 21 October 2018), online: <https://www.toolkit.bc.ca/tool/development-cost-charges>.
[81] *Ibid*.
[82] The B.C. DCC *Best Practices Guide* states that "the road DCC program is an outcome of master transportation planning, and 'highway facilities' have been interpreted, in practice, to include projects such as . . . transit provisions such as bus pull-ins; and,

v. Amenity Density Bonuses

Municipalities have the authority to provide density bonuses to developers.[83] Amenity density bonusing is an effective tool to create incentives for developers to contribute to public amenities and to encourage densification.

Under an amenity density bonus policy, the zoning of an area provides for a density that is generally applicable, as well as a higher density that is available if the developer conserves or provides certain amenities (for example, environmental protection, habitat restoration, and the acquisition of parkland).[84] Pedestrian and cycling infrastructure, as well as building to green building standards or using renewable energy sources may also be considered a public amenity. Amenity density bonuses must be established under the zoning bylaws and allow developers to surpass Floor Space Ratios in place under the OCP.[85]

Example of using Amenity Density Bonuses to promote 100% RE Cities:

> The City of Victoria provided for an increased FSR in identified areas in the downtown core. The City benefits as the developer can only take advantage of the higher density provided for by the amenity density bonus if the developer contributes to public amenities and utilities in the area.[86]

vi. Building Permit Incentive Program

A building permit rebate program may be implemented to provide an incentive to applicants for development if the proposed project will meet a standard laid out in the BCESC (see part III, section C, subsection i, "Energy Efficiency Standards" section, below). This could be an incentive to meet the lower steps of the BCESC, or it could be used in combination with other programs as a density bonus to meet the higher steps. Alternatively, the incentive could be a graduated program, with a lower cost for building permits for projects that meet higher steps under the BCESC.

Proceeds from a Climate Action Revenue Incentive Program (CARIP; see part III, section C, subsection v, "Climate Action Revenue Incentive Program" section, below) could be used to fund a rebate program.

vii. Greenstreaming

Greenstreaming is the process of fast-tracking applications for development or renovation permits for projects intended to promote energy efficiency or reduce emissions. It has been proposed as an

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bicycle/pedestrian infrastructure." (p 2.22) www2.gov.bc.ca/assets/gov/british-columbians-our-governments/local-governments/finance/dcc_best_practice_guide_2005.pdf

[83] *LGA*, see note 45, s 482.

[84] *Green Bylaws Toolkit*, see note 67, at 63.

[85] A floor space ratio or floor area ratio is the ratio between the total amount of gross floor area of a building and the area of the parcel upon which the building is located.

[86] City of Victoria, "Downtown Core Area Plan" (September 2011) at 35-40, online: <http://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/Local~Area~Planning/Downtown~Core~Area~Plan/DTCP_book_web.pdf>.

incentive for developers who implement the BCESC,[87] but it could be applied to any applications that if approved would result in reduced emissions. For example, municipalities could fast-track projects that exceed the BCESC by using renewable energy (electricity) rather than fossil fuels for space and water heating.

One mechanism to assist in the evaluation of whether a project should be fast-tracked is including an energy and GHG emissions evaluation as part of the application itself. This document would then be used to determine if a proposed project meets the threshold to be fast-tracked. It also may be used to determine if it aligns with current zoning and OCP goals.

If it would result in a measurable decrease in the processing time for an application, greenstreaming could be an additional incentive to green building. Any impact greenstreaming may have on the processing time for other projects should be considered.

TOOL #3: CREATE INCENTIVES FOR DEVELOPERS TO BUILD ENERGY EFFICIENT AND LOWER EMISSION BUILDINGS:

i. Strategically impose and waive or reduce development cost charges (DCCs) for eligible developments;
ii. Implement amenity density bonuses;
iii. Implement building permit rebate programs; and
iv. "Greenstream" or fast-track energy efficient building applications.

C. Buildings

Energy used to heat or cool buildings represented over half of the estimated energy expenditures in the District of Saanich and over 30% of its GHG emissions in 2016.[88] In Vancouver, buildings caused 59% of the city's emissions in 2017 and the majority of non-renewable energy used was to heat buildings.[89] As municipalities can have a direct impact on building energy use and emissions reduction in their jurisdictions, this is an area of high priority.

Municipalities control, through zoning and development rules, the allowable uses and density, including things like housing types (i.e. single detached housing, duplexes, etc.). Generally, denser building form, such as attached or apartment style housing use significantly less energy per unit than less dense building form, such as single detached homes.

Municipalities also have some power to regulate the energy efficiency of buildings, by mandating higher or lower levels of the BCESC within their jurisdictions. The BCESC is a set of standards within the

[87] Government of British Columbia, "BC Energy Step Code: A Best Practices Guide for Local Governments", Version 1.2 (September 15, 2017), at 24, online: <https://www2.gov.bc.ca/assets/gov/farming-natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/bcenergystepcode_guide_v1.pdf> ["*BCESC Best Practices Guide*"].
[88] *Hackney 100% RE Pathway Report*, see note 17, at 2. As mentioned above, at footnote 44, this refers to emissions on a territorial basis, and not on a consumption basis.
[89] City of Vancouver, "Renewable buildings" (accessed 19 September 2018), online: <https://vancouver.ca/green-vancouver/renewable-buildings.aspx>.

provincial *Building Code* that enables municipalities to enact more or less stringent building energy efficiency standards.[90] It is created under the provincial *Building Act*, SBC 2015, c 2. The lowest step requires systematic measurement of the energy efficiency of buildings. The highest step (Step Five) requires high levels of energy efficiency, equivalent to "net zero ready."

Municipalities may take a number of actions to promote 100% RE in the building sector. Municipalities may encourage developers to build attached housing rather than single detached homes through the use of the OCP, zoning and amenity density bonuses (as described in part III, sections A and B, above). Municipalities may adopt higher steps of the BCESC, requiring new buildings to meet higher levels of efficiency. Municipalities may create incentives for complying with the BCESC by offering an incentive to developers hiring an Energy Advisor to track compliance with the BCESC. They may opt into the *Solar Hot Water Ready Regulation*, or require new buildings to be net-zero energy buildings. Municipalities may encourage the establishment of district energy systems, i.e. through land use planning, zoning and in setting climate targets and creating climate plans. District energy systems may be low- or no-carbon and are an energy efficient way to provide space and water heating to buildings (and could conceptually provide cooling). Further, municipalities may provide incentives, such as by promoting the Revitalization Tax Exemption and the Climate Action Revenue Incentive Program to encourage developers to build to a higher standard of efficiency.

i. Energy Efficiency Standards

a. BC Energy Step Code

Municipalities have discretion to impose higher standards through the new BCESC,[91] beyond the basic building energy efficiency standards established in the *BC Building Code*.[92] The BCESC is a performance-based approach to energy efficiency requirements in new buildings and developments. It establishes an energy efficiency target and allows the builder to decide how to implement that target. The provincial government, in its 2016 Climate Leadership Plan, made the commitment that by 2032, all new buildings in BC would be required to be built to the net-zero ready standard, i.e. Step 5 of the Step Code. Net-zero energy ready buildings are defined as "a building built to high energy-efficiency standards such that it could (with additional measures) generate enough onsite energy to meet its own energy needs."[93] It is a voluntary system in which municipalities can choose to create incentives or require builders to meet one of the BCESC Steps. The BCESC is described in more detail in the Appendix, section C.[94]

[90] The *Building Code* is applicable to all municipalities other than Vancouver: William A Buholzer, "Local Government: A B.C. Legal Handbook (6th ed)" (The Continuing Legal Education Society of British Columbia: Vancouver, updated August 2015), at §5.26.
[91] This does not apply to the City of Vancouver, which has its own Building Code.
[92] *Building Act,* SBC 2015, c 2, s.5 ["*Building Act*"].
[93] *Provincial Policy: Local Government Implementation of the BC Energy Step Code, Section C2 of the Building Act Guide*, April 2017, page 4
[94] Government of British Columbia, "Intentions Paper, Clean, Efficient Buildings: Building a clean growth future for B.C." (2018; accessed 19 October 2018), at 5 (PDF p 6) <https://engage.gov.bc.ca/app/uploads/sites/391/2018/07/MoE-IntentionsPaper-Buildings.pdf>.

Example of Municipalities adopting the BCESC: [95]

The District of West Vancouver requires all new single family dwellings to comply with Step 3 of the BCESC.[96] The City of North Vancouver requires all residential buildings to comply with the BCESC (whether Step 1, 2 or 3 depends on the size and type of the building, as well as whether rezoning is required), and all commercial buildings to comply with Step 1 (or Step 2 if rezoning is required).[97] The District of North Vancouver requires all new single family homes, coach houses and smaller townhouses to comply with Step 3 of the BCESC, all new larger multi-family and apartment projects comply with Step 2 (or Step 3 if rezoning is required), and all new larger commercial, office, and retail buildings comply with Step 1.[98]

The City of Victoria will require all new building permit applications between November 1, 2018 and December 31, 2019 to comply with Step 1 of the BCESC, and as of January 1, 2020 all new applications will have to comply with Steps 2 or 3 (depending on the building size and type).[99]

The goal of promoting uniformity across the province in building standards, including energy efficient building, has the secondary goal of changing the standard within the development industry. If enough municipalities require that developments reach the highest steps in the BCESC, the industry will adapt. A benefit from this shift would be that as more developers invest in the training and resources to provide that service, building energy efficient buildings would become more affordable and accessible.

To offset the additional costs associated with building to a higher standard of efficiency, municipalities can take advantage of financial incentives and tools.[100] One such program is the Energy Advisor Rebate Program. It is offered to developers to subsidize the cost of hiring an Energy Advisor to evaluate their development for compliance with the BCESC steps. This program could be used in combination with other incentives for reaching higher steps.

b. *Solar Hot Water Ready Regulation*

Another way that municipalities can impose higher standards than those in the *Building Code* is by choosing to opt in to the *Solar Hot Water Ready Regulation* under the *Building Act*.[101] This regulation

[95] BC Energy Step Code, "Notification Form" (accessed 19 October 2018), online: <https://energystepcode.ca/notification/>.
[96] West Vancouver, "BC Energy Step Code" (accessed 19 October 2018), online: <https://westvancouver.ca/home-building-property/construction-renovating/building-permits/energy-step-code>.
[97] City of North Vancouver, "BC Energy Step Code for New Buildings" (accessed 19 October 2018), online: <https://www.cnv.org/property-and-development/building-and-development/plans-and-programs/energy-efficient-buildings-initiative/energy-efficient-bylaws-for-new-buildings>.
[98] District of North Vancouver, "Energy Step Code" (accessed 19 October 2018), online: <https://www.dnv.org/property-development/energy-step-code>.
[99] City of Victoria, "BC Energy Step Code, Information for Applicants – Land Use Applications and Building Permits" (accessed 19 October 2018), online: <https://www.victoria.ca/assets/Departments/Planning~Development/Community~Planning/Step_Code_1-pager_post-adoption.pdf>.
[100] During the transition period, these cost offsets must make up the difference in building costs if higher steps in the BCESC are being required by the local government.
[101] *Solar Hot Water Ready Regulation*, BC Reg 101/2011 ["*Solar Hot Water Ready Regulation*"].

requires new single family homes to be "solar hot water ready," which means that the home can support a solar hot water system in the future (which, among other things, requires a stronger roof).[102] Thirty-six municipalities have adopted this regulation.[103]

TOOL #4: REQUIRE NEW DEVELOPMENTS BE BUILT TO A HIGHER STANDARD OF EFFICIENCY:

i. Reference the highest level of the BC Energy Step Code (BCESC) as soon as legally allowed; and
ii. Opt into the *Solar Hot Water Ready Regulation.*

ii. District Energy Systems

The UN Environment District Energy in Cities Secretariat seeks to "put district energy on the global policy agenda."[104] District Energy in Cities defines district energy systems as:

> *…networks of underground insulated pipes that pump hot or cold water to multiple buildings in a district, neighbourhood or city. Such systems create synergies between the production and supply of heating, cooling, domestic hot water and electricity, and can be integrated with municipal systems such as power, sanitation, sewage treatment, transport and waste. This enables integrated energy grids that fuel low-carbon, energy efficient heating and cooling, and maximize local renewable resources.*[105]

Municipalities may encourage the establishment of district energy through land use planning, zoning and in setting climate targets and creating climate plans. Notably, any matter relating to district energy systems is an "unrestricted matter" for the purposes of the *Building Act*,[106] so municipalities may regulate in this area without being limited to referencing standards established in the BCESC.

Municipaities may include district energy systems in their OCPs, encourage compact land use (through attached housing and clustering, as outlined in part III, section B, above), and may require developers, in their applications for building permits, to assess the suitability of proposed new buildings to accommodate district energy systems. Municipalities also may require mixed-use zoning in areas where district energy is feasible. This ensures that developers who wish to implement district energy systems are not required to apply for rezoning. Finally, municipalities may include district energy systems in their

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[102] Government of British Columbia, "Solar Hot Water Regulation" (accessed 19 October 2018), online: <https://www2.gov.bc.ca/gov/content/industry/construction-industry/building-codes-standards/the-codes/other-regulations/solar-hot-water-ready>.
[103] *Solar Hot Water Ready Regulation*, see note 101, at s 2.
[104] UN Environment District Energy in Cities Initiative, "Governance" (accessed 19 October 2018), online: <http://www.districtenergyinitiative.org/governance>.
[105] United Nations Environment Programme, District Energy in Cities Initiative, "The Power of District Energy" (accessed 19 October 2018), online: <http://www.districtenergyinitiative.org/power-district-energy>.
[106] *Building Act General Regulation*, see note 61, at s.2(f).

long-term climate or 100% RE plans, including as a part of any renewable energy targets.[107]

In the case of existing district energy systems, municipalities may require any new developments within the area of the district energy system to connect.

Examples of District Energy Systems in BC:

In BC, public utilities are regulated by the BC Utilities Commission (BCUC), unless the utility is provided by a local government or they are otherwise excluded or exempted from regulation.[108] Included below are examples of each.

Local government-regulated: The City of Vancouver owns and operates a district energy system in Southeast False Creek, called the Neighbourhood Energy Utility (NEU). The NEU uses heat from untreated sewage wastewater to provide heat and hot water to all buildings in Southeast False Creek. The City enacted the Energy Utility System Bylaw[109] to require all new buildings in the area to connect to the NEU, and requires all those applying for rezoning over 2 acres to investigate the viability of district energy.[110] Notably, the City of Vancouver has authority provided to it by the *Vancouver Charter*,[111] which was amended in 2007 to allow Vancouver to provide energy utility services.

Provincially-regulated: Dockside Green Energy in Victoria is an example of a district energy system that is investor-owned and regulated at the provincial level by the BCUC. The energy system supplies space heating and hot water to the full Dockside Green development, which includes residential, office, retail, and light industrial space, as well as the nearby Delta Hotel. Although it is intended to use wood waste biomass as a fuel source, it is currently running on natural gas for cost-effectiveness reasons (until higher demands are reached).[112]

TOOL #5: ENCOURAGE THE ESTABLISHMENT OF DISTRICT ENERGY THROUGH LAND USE PLANNING, ZONING AND IN CREATING CLIMATE PLANS.

iii. Limits on GHG Emission Intensity of Buildings

Municipalities other than Vancouver likely do not have the power to place GHG emission limits (intensity limits or outright limits) on buildings as a part of their power to regulate buildings under *Community*

[107] United Nations Environment Programme, District Energy in Cities Initiative, "Chapter 2: A Framework for City Level Policies and Strategies for District Energy" from the full "District Energy in Cities: Unlocking the Potential of Energy Efficiency and Renewable Energy" report (2015), at 49, online: <http://www.districtenergyinitiative.org/sites/default/files/report_pdf/02%20District%20Energy%20Chapter%202_print.pdf>.
[108] *Utilities Commission Act*, RSBC 1996, c 473, s 1 (see definition of "public utility").
[109] City of Vancouver, "Energy Utility System Bylaw No. 9552" (updated to 17 April 2018), online: <https://bylaws.vancouver.ca/9552c.PDF>.
[110] Peter Ostergaard, "The Regulation of District Energy Systems" (May 2012, rev 23 May 2012), at 12, online: Pacific Institute for Climate Solutions <https://pics.uvic.ca/sites/default/files/uploads/publications/WP_District_Energy_May2012.pdf>.
[111] SBC 1953, c 55, s 300.1.
[112] Dockside Green Energy, "The Energy System" (accessed 19 October 2018), online: <http://docksidegreenenergy.com/the_energy_system.html>.

Charter except in reference to the BCESC.[113] However, they may indirectly affect GHG emission intensity through DPAs, as mentioned above, and may offer incentives, such as reduced DCCs, to projects that meet a standard related to GHG emissions (such as using electricity for space and water heating rather than fossil fuels).

Limiting GHG Intensity of Buildings

The City of Vancouver is not restricted by the *Building Act* in enacting its building bylaw. Notably, it has released a Zero Emissions Building Plan, which places limits on the GHG emission intensity of new buildings and intends to step these down over time through the Vancouver Building Bylaw 10908.[114] It also proposes to phase out the use of fossil fuels for space and water heating to achieve zero emission buildings**.** As of July 2016, it was the only jurisdiction in North America to establish limits on buildings' GHG emissions,[115] which is a direct step towards 100% RE.

iv. Revitalization Tax Exemptions

Under the *Community Charter*, municipalities may provide tax exemptions for the purpose of encouraging revitalization.[116] These revitalization tax exemptions (RTEs) may be applied to land, to improvements, or to both. RTEs may be targeted to areas that are central and compact, thereby encouraging redeveloping at higher densities and with more energy efficient building forms and energy sources.

RTEs may now be applied to a specific area within the municipality, a certain type of property, or a particular action or circumstance relating to the property.[117] This provides municipalities with much more discretion to use RTEs as a tool towards becoming a 100% RE community.

In order to implement RTEs, the municipality, in a bylaw, must set standards or guidelines, exemption amounts, and the maximum term over which those exemptions can be applied.[118] The bylaw can also address conditions of the RTE program, and provisions for recapturing amounts from exemptions if the conditions are not met. The municipality has considerable flexibility in setting RTE standards, which means that they can set different rates for different types of buildings, or for reaching different standards of efficiency.

[113] *Building Act General Regulation*, see note 61, at s.2.2.
[114] City of Vancouver "Zero Emissions Building Plan" (12 July 2016), at 7, online: <https://vancouver.ca/files/cov/zero-emissions-building-plan.pdf>.
[115] *Ibid*.
[116] *Community Charter,* SBC 2003, c 26, s.226 ["*Community Charter*"].
[117] *Ibid*, s.226(5)(b).
[118] The maximum timeline for revitalization tax exemptions is 10 years.

Examples of using RTEs for 100% RE:

The District of Maple Ridge offers a two-year RTE for high-rise residential developments within a certain zone, with buildings that are certified LEED Silver, Gold, or Platinum qualifying for a four-year exemption.[119] This is clarified in the below table:

Year	Basic Exemption	Green Exemption
1	100%	100%
2	50%	75%
3	0%	50%
4	0%	25%

The City of Victoria has an RTE bylaw for green energy production, which provides exemptions for renewable energy systems, sustainable building methods, and sustainable heating and cooling methods.[120]

Tips for municipalities when implementing RTEs:

1. Municipalities can implement RTE programs for categories of development rather than just locations;
2. Municipalities can establish RTEs for a development's specific initiatives that reduce GHG emissions, such as community car rental services;
3. Municipalities can establish RTEs for characteristics of the development itself, such as high efficiency buildings, storm-water or streamside protection measures, brownfield development, or the development of district energy sources; and
4. Municipalities' broad discretion in setting RTEs means that almost any green initiative by a developer could potentially be included in an RTE program.

[119] BC Climate Action Toolkit, "Revitalization Tax Exemptions (RTEs)" (accessed 21 October 2018), online: <https://www.toolkit.bc.ca/tool/revitalization-tax-exemptions-rtes>.
[120] City of Victoria, "Revitalization Tax Exemption (Green Power Facilities) Bylaw No. 09-040 (25 June 2009), online: <https://www.victoria.ca/assets/City~Hall/Bylaws/bylaw-09-040.pdf>.

v. Climate Action Revenue Incentive Program

The Climate Action Revenue Incentive Program (CARIP) makes grants available to signatories of the BC Climate Action Charter provided that they reach certain specified requirements.[121] The value of the grant is equal to 100% of the local government's direct expenditure on the provincial carbon tax. The grant money could be repurposed with the goal of funding initiatives that aim to support energy efficient developments in a community.

TOOL #6: CREATE INCENTIVIZES FOR BUILDING TO A HIGHER STANDARD OF ENERGY EFFICIENCY:

i. Offer a rebate to developers hiring an Energy Advisor to track compliance;
ii. Use and promote the Revitalization Tax Exemption; and
iii. Use and promote the Climate Action Revenue Incentive Program.

D. Transportation

After housing, transportation is the biggest contributor of energy consumption in Saanich.[122] Municipalities may take a number of actions to create behavioural changes in transportation infrastructure use. First, they may re-allocate road space to encourage a switch to public transit (for example, working with the provincial government to create bus lanes), as well as to increase the proportion of human-powered transportation (for example, by expanding sidewalks, implementing bicycling networks and establishing pedestrian plazas). They may also take steps to make public transit faster and more reliable. Municipalities also may encourage residents to switch from gas-powered cars to electric vehicle (EVs) by requiring EV charging stations in public places and in new developments. Finally, they may encourage human-powered transportation through intentionally calibrating parking policies (as well as through the development of walkable, compact communities with local commercial areas, as discussed throughout this report).

i. Re-allocating Road Space (to public transit and bicycle lanes)

Re-allocating general purpose road space to active transportation modes and public transit is an effective way to reduce fossil fuel consumption and climate pollution. Experience shows that traffic volumes expand and contract with the amount of road space, without much change in travel speeds for cars and trucks.[123] The ability to re-allocate road space is one of the most powerful policy levers available to municipalities moving towards 100% RE, however that allocation can only occur on

[121] "Summary Report on Local Government Climate Actions" (September 2018; accessed 21 October 2018) at 1, online: <https://www2.gov.bc.ca/assets/gov/british-columbians-our-governments/local-governments/planning-land-use/carip_2017_summary.pdf>.
[122] *Hackney 100% RE Pathway* Report, see note 17, at 3. As mentioned at footnote 44, this refers to territorial emissions and not consumption based emissions.
[123] See for example: Clark Williams-Derry, "Sightline Research Backgrounder: Increases in greenhouse-gas emissions from highway-widening projects" (October 2007), online: <http://www.jtc.sala.ubc.ca/reports/analysis-ghg-roads.pdf>.

municipal roads. For provincial roads, municipalities can work with the provincial government through a regional transportation plan or directly with the Ministry of Transportation and Infrastructure.

This aligns with the *Pan-Canadian Framework on Clean Growth and Climate Change*'s commitment to "supporting the shift from higher to lower-emitting types of transportation."[124] The BC Climate Action Toolkit describes the benefits of human-powered transportation:

> *The enduring benefit of multi-modal transport systems is not only reduced carbon emissions. By accommodating and encouraging a choice of transportation modes, local governments can also reduce spending on transportation infrastructure, contribute to more vibrant streets and a healthier population, become more energy resilient, improve the environment and reduce traffic congestion.*[125]

Municipalities can re-allocate road space on municipal roads to reduce GHG pollution in a number of ways: by creating bus lanes, reducing the number of lanes for cars and trucks, creating protected bicycle lanes, widening sidewalks, creating pedestrian cross-walks, adding speed bumps, implementing lower speed limits, installing traffic calming devices such as planters in intersections, allocating parking and loading spaces on streets, and creating pedestrian streets and plazas.

[124] "Pan-Canadian Framework on Clean Growth and Climate Change" (Gatineau, Quebec: Environment and Climate Change Canada, 2016), at 18 (PDF p 26), online: <http://publications.gc.ca/collections/collection_2017/eccc/En4-294-2016-eng.pdf>.
[125] BC Climate Action Toolkit "Transportation Plans" (accessed 21 October 2018), online: <http://www.toolkit.bc.ca/tool/transportation-plan>.

Examples of Local Governments re-allocating road space to support a transition to 100% RE:

The City of Victoria is in the process of implementing a dedicated transit and cycling lane network to "shorten travel times for transit customers, increase the reliability of public transit and reduce greenhouse gas emissions by limiting idling and lowering the number of vehicles on the road."[126] It is also reducing the speed limit on a number of roads throughout the City, citing potential reduced GHG emissions as one of the reasons for the action.[127]

The City of Montreal has made a concerted effort to encourage cycling as a mode of transportation in the City. As of 2015, over 50% of Montreal residents cycled around town. [128] The number of bicycle trips in the City increased by 57% between 2008 and 2013, and in the City's central neighbourhoods, 4% of all trips were made by bicycle.[129] This has been attributed to the prevalence of Bixi, a bike sharing service, and the City having expanded its cycling path infrastructure by 40% from 2010 to 2016.[130] Montreal also implemented traffic-calming measures between 2010 and 2015 by installing speed humps, extending curbs and chicanes (serpentine curves in the road to slow traffic).[131]

The District of North Vancouver has a Pedestrian Master Plan that outlines the impediments to walking and prioritizes improvements. High priority improvements include establishing a "sidewalk priority index" to determine priority locations for new or extended sidewalks, prioritizing sidewalk improvements, and creating pedestrian priority areas within the emerging village and town centres.[132] It also outlines many other improvements, including installing refuge medians in the middle of crossing areas on high-volume multi-lane roads, extending curbs, educating snow plow operators to avoid piles of snow in pedestrian areas, and working with schools to ensure safe routes to schools.[133]

The Major Road Network in Metro Vancouver is an innovative cooperative management model in which Translink (the statutory authority responsible for regional transportation in Metro Vancouver) works with the municipalities in the Metro Vancouver area to ensure the most efficient movement of people and goods across the major arterial roads in the region. Funding is provided by Translink, while ownership and jurisdiction remains with the municipalities.[134]

When the City of Victoria created 24/7 bus lanes on Douglas Street, the provincial government followed suit and did the same on the provincial section of Douglas (Highway 1) in Saanich.

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[126] City of Victoria, "Douglas Street Priority Transit & Cycling Lanes" (accessed 22 October 2018), online: <https://www.victoria.ca/EN/main/residents/transportation/douglas-street-priority-transit-and-cycling-lanes.html>.
[127] City of Victoria, "Reducing Speed Limits within the City of Victoria" (accessed 22 October 2018), online: <https://www.victoria.ca/EN/main/residents/transportation/consideration-of-speed-limit-changes.html>.
[128] Vélo Québec, "Cycling in Québec in 2015" (2015), at 4, online: <http://www.velo.qc.ca/files/file/expertise/VQ_Cycling2015.pdf> ["*Velo Quebec Report*"].
[129] *Ibid*, at 15.
[130] Gloria Henriquez, "More than 1 million Montreal cyclists on the road: Vélo Québec report" (5 July 2016), online: Global News <https://globalnews.ca/news/2802838/more-than-1-million-montreal-cyclists-on-the-road-velo-quebec-report/>.
[131] *Velo Quebec Report*, see note 128, at 14.
[132] District of North Vancouver, "Pedestrian Master Plan" (accessed 22 October 2018), online: <https://www.dnv.org/property-and-development/pedestrian-master-plan>.
[133] *Ibid*.
[134] Translink, "Major Road Network & Bridges" (accessed 22 October 2018), online: <https://www.translink.ca/Getting-Around/Driving/Major-Road-Network-and-Bridges.aspx>.

International examples of re-allocating road space:

In the 1961 classic "The Death and Life of Great American Cities," Jane Jacobs described that after the road through Washington Square Park in New York was closed "cars — just disappeared into thin air."[135] Traffic did not increase on the surrounding streets as many had predicted. Over the last half century, many similar experiences of disappearing traffic have been documented.[136] And since a bus lane can carry five to 10 times as many people as a lane of cars, well-designed bus lanes can handle decades of increasing transit ridership on most routes.

One of the most dramatic road space re-allocations was designed to reduce dependence on oil after the 1973 oil shock. Zurich, Switzerland created a still unprecedented network of exclusive transit lanes and signal priority for both streetcars and buses. Despite its modest size, Zurich has high transit ridership at over 60% of its residents, which is much higher than in some large European cities.[137] Other well known re-allocation examples include Copenhagen and Amsterdam creating networks of protected bicycle lanes, the City of Paris creating artificial beaches on what were once expressways along the River Seine, and New York converting Times Square into a pedestrian plaza.

ii. Electric Vehicles

Electric vehicles and EV charging stations will become increasingly important with the expected jump in the number of EVs in British Columbia.[138] Increased access to EV charging stations will be critical in reaching the 100% RE goal (as will provincial incentive programs such as the Clean Energy Vehicle (CEV) Program).[139]

Municipalities may establish technical requirements for buildings on matters that are not covered in the *Building Act*, provided they are under municipal jurisdiction. EV charging stations and plug-in requirements fit into this "out-of-scope" category for new building, and are therefore open to regulation by municipalities.[140] Municipalities are requiring EV charging stations in new buildings through

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[135] Jane Jacobs, *The Death and Life of Great American Cities* (New York: Vintage Books, 1961) at 362.
[136] Sally Cairns, Stephen Atkins & Phil Goodwin, "Disappearing Traffic? The Story so far" (Proceedings of the Institution of Civil Engineers, Municipal Engineer 151, March 2002 Issue 1) 13-22, online: <https://nacto.org/wp-content/uploads/2015/04/disappearing_traffic_cairns.pdf>.
[137] Feargus O'Sullivan, "Breaking Down the Many Ways Europe's City-Dwellers Get to Work" (18 October 2017), online: CityLab <https://www.citylab.com/transportation/2017/10/riding-bikes-buses-trains-in-european-cities/543141/>.
[138] BC Hydro expects the number of EVs in BC to increase to 300,000 in less than 15 years: "Vancouver's electric car owners to see fees for using city-owned charge stations" (26 June 2017), online: National Post <http://nationalpost.com/pmn/news-pmn/canada-news-pmn/vancouvers-electric-car-owners-to-see-fees-for-using-city-owned-charge-stations>.
[139] Government of British Columbia "Clean Energy Vehicle Program" (accessed 21 October 2018), online: <https://www2.gov.bc.ca/gov/content/industry/electricity-alternative-energy/transportation-energies/clean-transportation-policies-programs/clean-energy-vehicle-program>.
[140] BC Office of Housing and Construction Standards, "Changes for Local Government Under Section 5 of the *Building Act*, Appendix to s.B1 of the *Building Act* Guide" (February 2017), at s.3.5, online: <https://www2.gov.bc.ca/assets/gov/farming-

negotiated rezoning, through density bonuses, and as part of their authority in relation to parking.[141]

Examples of Municipalities encouraging EV use:

Municipalities in Metro Vancouver have enacted various by-laws requiring EV transitions. North Vancouver enacted a policy requiring new multi-family builds to have 20% of parking stalls EV-ready and the remainder able to be wired in the future, 10% of commercial stalls EV-ready, and all secure bicycle storage to have charging for electric bicycles.[142] The City of Vancouver passed Building Code Bylaw 10908, which requires EV charging in new commercial and residential buildings.[143] The City of Vancouver also allows electric scooters to park for free in metered motorcycle parking spaces and at a 75% discount in metered regular parking spaces.[144]

The City of Kelowna provides two hours of free street parking per day for EVs with its Eco-Pass permit program.[145]

Plug In BC's Charging Solutions and Incentives Program is a provincial funding program to assist building owners to acquire EV charging stations. The program is open to multi-residential unit buildings of three or more self-contained dwelling units, and successful applicants receive up to 75% of the costs to install EV charging stations. Note that the program is currently fully allocated, so is accepting applications for a waitlist.[146] Municipalities could augment such provincially provided incentives with their own funds, as some municipalities do for the Province's oil-to-heat pump program.

iii. Parking Policies

Municipalities have jurisdiction over commercial loading areas, on- and off- street parking areas and rates.[147] To further 100% RE, municipal parking policies can prioritize active transportation including transit, walking and cycling by decreasing the number of parking spaces per unit, and thus the cost of new units, in central areas that are accessible to transit and in walkable neighbourhoods. Municipalities may craft on-street parking and loading zone rules to favour EVs or zero-emission vehicles (ZEVs), such as ZEV-only parking spaces. Higher parking meter rates may also discourage personal use motor vehicles and the revenue used in favour of active transportation.

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natural-resources-and-industry/construction-industry/building-codes-and-standards/guides/baguide_b1appendix_rev_feb2017.pdf> ["*Changes under s.5 of the Building Act*"].

[141] City of Richmond, "Residential Electric Vehicle Charging: A Guide for Local Governments" (undated, accessed 16 April 2019), at 11-12, online: <https://pluginbc.ca/wp/wp-content/uploads/2018/10/Residential-EV-Charging-A-Guide-for-Local-Governments.pdf>.

[142] District of North Vancouver "Supporting Electric Vehicles" (accessed 21 October 2018), online: <https://www.dnv.org/property-and-development/supporting-electric-vehicles>.

[143] Vancouver Bylaw, at Consolidated Bylaw Amendments for Book 1, s 10.4, online: <http://vancouver.ca/your-government/vancouver-building-bylaw.aspx>.

[144] City of Vancouver, "Motorcycle and Scooter Parking" (accessed 10 October 2018), online: <https://vancouver.ca/streets-transportation/motorcycles-and-scooters.aspx>.

[145] City of Kelowna, "Eco Pass Permit Program" (accessed 22 October 2018), online: <https://www.kelowna.ca/roads-transportation/parking/eco-pass-permit-program>.

[146] Plug In BC, "Charging Solutions & Incentives" (accessed 10 October 2018), online: <https://pluginbc.ca/incentives/charging-solutions-incentives/>.

[147] *LGA,* see note 45, s.525

Examples of Municipalities updating their parking policies:

Local governments in the U.S., including Hartford, CT and Buffalo, NY, have reduced parking minimum requirements for new residential and commercial developments.[148] San Francisco is poised to become the first large city in the US to eliminate parking minimums.[149] In Europe and South America some cities set the maximum parking allowed, rather than the minimum.[150]

Seattle, WA allows for sharing parking spaces, and requires that parking spaces are unbundled from rental agreements and leases so that renters and lessees have the option of not paying for a parking space if it is not needed.[151]

In San Francisco the rates for parking fluctuate with demand.[152]

In Vancouver, carsharing vehicles may park in "resident only" and "no parking except with permit" areas.[153] Developers may reduce the number of parking spaces they provide in residential developments by five spaces for every one carshare space.[154] Further, the City requires many building types to have bicycle parking, and for some of those buildings, they require showering facilities (to encourage more people to bike to work and other destinations).[155] As mentioned above, in part III, section A, subsection iii, "Sustainability Checklist" starting January 1, 2019, the City of Vancouver will require some developments to accumulate a number of credits in a "Transportation Demand Management" administrative bulletin. They can receive credits for a variety of parking-related measures, including reducing total parking supply, requiring users to pay for parking, providing carshare vehicle parking and transit passes to building occupants, and increasing the bicycle parking over what is required by by-law.[156]

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[148] David Baker & Brad Leibin, "Toward Zero Parking: Challenging Conventional Wisdom for Multifamily" (2 July 2018; accessed 21 October 2018), online: Urban Land <https://urbanland.uli.org/economy-markets-trends/toward-zero-parking-challenging-conventional-wisdom-multifamily-developments/>.

[149] Joshua Sabatini "SF to do away with minimum parking requirements for developments" (26 November 2018), online: San Francisco Examiner <http://www.sfexaminer.com/sf-away-minimum-parking-requirements-developments/>.

[150] Nate Berg "Lots to lose: how cities around the world are eliminating car parks" (27 September 2016), online: The Guardian <https://www.theguardian.com/cities/2016/sep/27/cities-eliminating-car-parks-parking>.

[151] Capitol Hill Seattle Blog "Unbundling, flexibility, 'frequent transit service' — What's in Seattle's 'Neighborhood Parking Reform' proposals" (21 February 2018), online: <https://www.capitolhillseattle.com/2018/02/unbundling-flexibility-frequent-transit-service-whats-in-seattles-neighborhood-parking-reform-proposals/>.

[152] Metropolitan Transportation Commission, "MTC's VPP Parking Project" (accessed 21 October 2018), online: <http://regionalparking.mtc.ca.gov/#/>.

[153] City of Vancouver, Street and Traffic Bylaw No. 2849 (consolidated to 12 December 2017), online: <https://bylaws.vancouver.ca/2849c.PDF>.

[154] City of Vancouver, Parking Bylaw (September 2015), at s.3.2.2, online: <https://bylaws.vancouver.ca/parking/sec03.pdf>.

[155] See: City of Vancouver, Parking Bylaw (July 2018), at s.6, online: <https://bylaws.vancouver.ca/parking/sec06.pdf>; see also: City of Vancouver, Bylaw No. 7841, a Bylaw to Amend Bylaw No. 6134 being the Building Bylaw (17 October 1995), online: <https://vancouver.ca/files/cov/bylaw-7481-building-shower-facilities.pdf>.

[156] *Vancouver TDM Admin Bulletin*, see note 53.

TOOL #7: EFFECT BEHAVIOURAL CHANGES ON THE PART OF RESIDENTS TO REDUCE THE TRANSPORTATION SECTOR'S IMPACT BY:

i. Re-allocating road space to encourage a switch to public transit (for example, creating bus lanes, where possible, on municipal roads and working with the provincial government on their roads);
ii. Increasing the proportion of human-powered transportation (for example, expanding sidewalks, bicycling networks and pedestrian plazas);
iii. Taking steps to make public transit faster and more reliable through work with BC Transit;
iv. Encouraging residents to switch from gas-powered cars to EVs by requiring EV charging stations in public places and in new developments; and
v. Encouraging human-powered transportation through intentionally calibrating parking policies.

Appendix: Discussion of Municipal Jurisdiction

The Province grants local governments their jurisdiction and authority. In British Columbia, the two main statutes that do this are the *Community Charter*[157] and the *LGA*.[158, 159]

A. *Community Charter*

The *Community Charter* is the legislation which establishes the principles for municipal-provincial relations in BC. Broadly, it addresses local government legislation in the areas of municipal-provincial relations, broad powers, and accountability of the municipality.

The *Community Charter* also contains provisions which grant municipalities the authority to pass bylaws and regulations for the protection of the environment.

Generally, municipalities may create bylaws to regulate and impose requirements in areas under their jurisdiction, including areas which could contribute to reaching 100% RE. These areas include the protection of the natural environment, the regulation of buildings and of other structures, as permitted by the Province.[160] Municipalities can also provide, and regulate, any services they consider necessary or desirable, which also grants them a lot of room to work with reaching 100% RE.[161]

Municipalities have the regulatory authority to provide for a system of licenses, permits, or approvals.[162] As part of this power, the municipality can prohibit any activity or thing until the required permit, license or approval has been granted, and can refuse to grant those permits, licenses, or approvals. A municipality may include terms and conditions on a license, permit or approval. It may also adopt a standard, code or rule that is published by a provincial, national or international body or standards association, or that is enacted as a law under this or another jurisdiction (including a foreign jurisdiction).[163] A municipality can reference any code or regulation made in virtually any other jurisdiction in its bylaws, which could easily simplify the creation of new bylaws.

Municipalities have almost complete discretion in how services are delivered, and in how zoning for land use and density is implemented within their boundaries. Looking to green bylaws created in other jurisdictions can be a source of inspiration when implementing new sustainability-focused bylaws.[164]

The *Community Charter* grants municipalities the responsibility for regulating and implementing building standards, in accordance with the requirements in the *Building Act*. Municipalities have some discretion to impose higher standards than the basic rules imposed in the *Building Act*,[165] including the choice to

[157] *Community Charter,* see note 116.
[158] *LGA*, see note 45.
[159] The City of Vancouver is granted some of its municipal powers under the *Vancouver City Charter,* S.B.C. 1953, c. 55.
[160] *Community Charter,* see note 116.
[161] *Ibid*, s.8(2).
[162] *Ibid*, s.15.
[163] *Ibid*, s.15 (2).
[164] For a resource for green bylaws examples, refer to *Green Bylaws Toolkit*, see note 67.
[165] *Building Act,* see note 92, s.5.

opt in to voluntary regulations such as the *Solar Hot Water Ready Regulation*,[166] or the new BCESC (see part III, section C, above).

This municipal power to regulate buildings and other structures under the *Community Charter* can only be used with the aim of achieving certain purposes. These are: (1) the provisions of access to a building or structure for a person with disabilities, (2) the conservation of energy or water, (3) the reduction of GHG emissions, or (4) the health, safety or protection of persons or property.[167] Purposes (2) and (3) are directly relevant to municipalities taking the initiative to achieve 100% RE.

B. *Local Government Act*

The *LGA* establishes the legal framework for regional districts to exercise many analogous powers to those granted to municipalities under the *Community Charter*,[168] and also lays out the land use planning power for both regional districts and municipalities.[169] For achieving a goal of 100% RE, important land use powers for municipalities include the option to create official community plans (OCPs), the power to designate development permit areas (DPAs), and the power to impose and collect development cost charges (DCCs).

Municipalities can create official community plans (OCPs) with a view to setting the vision for development over the next five years at minimum (see part III, section A, subsection i of this report). If a municipality implements an OCP, then it must address anticipated housing needs over that timeframe, including the location and density of likely new residential developments.[170] It must also lay out restrictions on the use of land that is subject to hazardous conditions or for environmentally sensitive lands. OCPs are also required to include " … targets for the reduction of greenhouse gas emissions in the area covered by the plan, and policies and actions of the local government proposed with respect to achieving those targets",[171] however, this requirement does not constitute a plan to achieve the targets.

Optional policy statements that may be part of an OCP, and that could further contribute to reaching 100% RE, include policies in relation to the preservation, protection, restoration and enhancement of the natural environment, ecosystems and biological diversity.[172]

OCPs may designate a development permit area (DPA) for one of several purposes, including the protection of the natural environment, to establish objectives to promote energy conservation or water conservation, or to reduce the production of GHG emissions.[173] Lands within DPAs require special permits if they are to be developed; this can help protect the area by restricting and providing extra scrutiny on development in sensitive areas.

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[166] *Solar Hot Water Ready Regulation*, see note 101.
[167] *Community Charter,* see note 116, s.8(3)(l).
[168] *LGA*, see note 45, Parts 8-10.
[169] *Ibid*, Parts 13-15.
[170] *Ibid*, s.473.
[171] *Ibid*, s.473 (3)
[172] *Ibid*, s.474(1)(d).
[173] *Ibid*, s.488.

C. The *Building Act* and the BC Energy Step Code

As discussed, the authority to regulate building standards is granted to municipalities under the *Community Charter.* The *Building Act* contains standards and provisions that regulate new buildings in the province.[174] Although municipalities cannot set their own standards in the area of building regulation, they can "opt in" to additional regulations under the *Building Act*, such as the *Solar Hot Water Ready Regulation*, which requires that new single-occupancy residential buildings have the internal infrastructure to allow easy installation of a thermal solar system[175] (this is discussed above at part III, section C, subsection i, paragraph b). Under section 5 of the *Building Act*, municipalities may impose bylaws for technical building requirements, provided they are not contrary to the requirements in the *Building Act*.[176]

As of December 15, 2017 changes to the *Building Act* resulted in any municipal bylaws imposing technical building regulations being of no force and effect if the matters they regulated were: (a) within the scope of the *Building Act*; and (b) not on the unrestricted matters list in the *Building Act General Regulation*.[177] Instead, muncipalities can implement and enforce the BCESC to require buildings be developed to a higher standard of efficiency.[178] Any previous efficiency bylaws were of no force and effect after December 15, 2017, but could be transitioned to an equivalent step under the BCESC.[179]

100% RE and unrestricted matters under the Building Act:

> The unrestricted matters list includes any matter as it relates to a district energy system, and also the form, exterior design, and machinery, equipment or systems for any building in a DPA[180] for the purpose of energy or water conservation, or the reduction of GHG emissions.[181]

The BCESC is a performance-based approach to energy efficiency requirements in new buildings and developments. It establishes an energy efficiency target and allows the builder to decide how to implement that target. The goal of the BCESC is to move towards net-zero energy ready buildings. Net-zero energy ready buildings are capable of generating enough energy onsite that they do not require outside power.

All new construction across the province is to be net-zero energy ready by 2032 (in Vancouver this is by 2030)[182], which aligns with the *Pan-Canadian Framework on Clean Growth and Climate Change*

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[174] *Building Act,* see note 92, s.5.
[175] *Solar Hot Water Ready Regulation*, see note 101.
[176] *Community Charter*, see note 113, s.10(1): "A provision of a municipal bylaw has no effect if it is inconsistent with a provincial enactment."
[177] *Changes under s.5 of the Building Act*, see note 140.
[178] BC Building Code, article 9.36.6.3 or 10.2.3.3 of Division B.
[179] Local governments are advised to contact the Energy Step Code Council (ESCC) when beginning to consider adopting the BCESC into their bylaws: <codequestion@gov.bc.ca>.
[180] See part III, section C, subsection i, "Development Permit Areas".
[181] *Building Act General Regulation*, see note 61, at ss.2(e) and (f).
[182] City of Vancouver "Zero Emissions Buildings" (accessed 19 October 2018), online: <https://vancouver.ca/green-vancouver/zero-emissions-buildings.aspx>.

("PFCGCC"). The federal government and all territorial and provincial governments (other than Saskatchewan) signed-on to the commitments contained in the PFCGCC, which calls for all provinces to have net-zero energy ready building codes in place by 2030.[183]

How is the Energy Step Code Measured?

The BCESC can currently be applied to small or simple buildings (Part 9 buildings under the Building Code) anywhere in the province, and to complex buildings (Part 3 buildings) in climate zone 4, which covers the Lower Mainland and the Capital Region. In the future, proposals will be developed for BCESC requirements in other climate zones.[184]

The BCESC consists of a series of increasingly stringent steps for energy efficient building standards. Step 1, called the enhanced compliance step, requires that developers build to the same standard as is required by the current *Building Act*. To be compliant with this step, a developer needs only to evaluate the buildings using the same tests as required for the other Steps. This is designed to familiarize builders with the new process for applying the BCESC. The energy level is evaluated using the same test and metrics for all steps in the BCESC. Higher steps require attaining a higher level of energy efficiency. The evaluation method requires running a computer energy modelling program on the entire building or development and an airtightness test to evaluate the air leakage rate of the building. There are also requirements for the building envelope and for equipment and systems within the building to demonstrate they have reached specific targets. The development must also meet the required level of energy efficiency in all of those categories to satisfy that step.

It is important to note that energy efficiency only represents one of five requirements under the *Building Code*, and that buildings built to those specific steps must still meet the Code's specifications for safety, health, accessibility, and fire and structural protection.

The BCESC is a voluntary system: municipalities can choose to incentivize or require builders to meet one of the BCESC Steps. As of 2017 municipalities may reference the BCESC in their bylaws and enforce requirements under the BCESC.

[183] Government of Canada, "Complementary Actions to Reduce Emissions" (modified 14 December 2016; accessed 21 October 2018), online: <https://www.canada.ca/en/services/environment/weather/climatechange/pan-canadian-framework/complementary-actions-reduce-emissions.html>.
[184] *BCESC Best Practices Guide*, see note 87, at 16.

Timelines for implementing the BC Energy Step Code:

There is a transition period in effect from 2017-2020 during which municipalities cannot require buildings to meet the BCESC's upper steps (steps 4 and 5). During the transition period local governments may only reference the upper steps if reaching that upper step is "paired with appropriate benefits."[185]

Municipalities that intend to require compliance with the BCESC's lower steps (steps 2 and 3) must notify industry and the ESCC at least 6 months before enforcing the requirements; for upper steps, this is extended to at least 12 months before enforcement.[186]

The BCESC is intended to promote uniformity in energy efficiency standards across the province. As mentioned above, municipalities cannot have their own energy efficiency programs—they must reference the BCESC.

[185] *Ibid*, at 32.
[186] *Ibid*, at 32.