ICLEI Local Governments for Sustainability

100% RENEWABLES CITIES & REGIONS ROADMAP

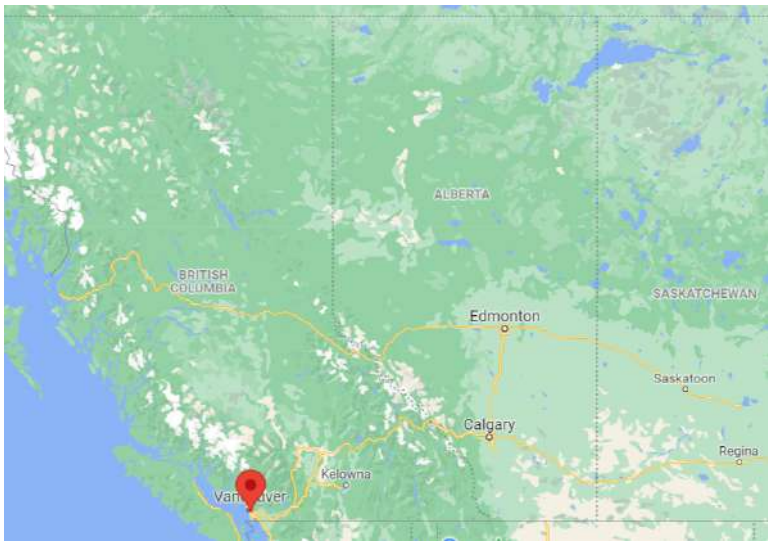
Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag

CITY OF VANCOUVER

ZERO EMISSIONS BUILDINGS: A STRONG FOUNDATION FOR 100% RENEWABLE ENERGY AND CARBON NEUTRALITY



City of Vancouver, Canada: Facts and figures

Population

697,266 (2020)

Total area

114 km²

Municipal Budget

CA$1.6 billion (2021)

Figure 1: Map of City of Vancouver, British Columbia, Canada
Source: Google Maps, 2021

The City of Vancouver is one of the fastest-growing low-carbon economies in North America and is considered one of the most livable cities in the world. Having pledged to become carbon neutral and achieve 100 percent renewable energy status by 2050, the city has focused considerable efforts on the buildings sector, which accounts for 54 percent of the city's greenhouse gas emissions. The aim of achieving zero emissions buildings has been encouraged through a number of innovative policies and tools.

Introduction

Globally, the buildings sector is a major emitter of greenhouse gases (GHG), accounting for 36 percent of final energy use and 39 percent of energy- and process-related carbon dioxide (CO_2) emissions in 2018 (International Energy Agency, 2019). The global stock of buildings has been expanding rapidly, and while efficiency improvements continue to take place, they do not keep up with the pace of expansion, leading to greater overall energy use, and therefore emissions. This higher energy demand is being met with increasing electrification, however in many countries electricity continues to be generated with fossil fuels, which only further underlines the need to move towards renewable energy sources.

Figure 2: The Vancouver Convention Center, which is certified double LEED platinum. Source: Scott Webb, Unsplash

Space and water heating account for a significant portion (around 50 percent in 2018) of building energy end uses (International Energy Agency, 2019). The heating requirement for buildings can be fairly energy-intensive, and most heating equipment is still primarily fossil-fuel based. The intensity of space and water heating has only seen small reductions over the last decade (International Energy Agency, 2020). Further reductions can be made by improving building envelopes (i.e., the 'shell'), as well as changing the type of heating used to less fossil-fuel dependent alternatives such as heat pumps, district heating, solar thermal systems, and boilers fueled by biomass and hydrogen gas. The buildings sector therefore remains a major source of emissions, but with a high emissions-reduction potential using existing technologies and policies.

A number of local governments have chosen to focus specifically on this area for their climate action plans, including the City of Vancouver.

The City of Vancouver is a coastal city located in Southwestern Canada. It is the largest city in the province of British Columbia, home to a diverse population and is a thriving cultural and economic center. It is a major hub for international trade as the location of Canada's largest port, the Port of Vancouver.

Over the last decades, Vancouver has prioritized sustainability in its planning and development. It is home to 25 percent of Canada's 'cleantech' enterprises, and in 2018 employed one in fifteen residents in the 'green economy' (Vancouver Economic Commission, 2018). Furthermore, the green building design and construction sector was the second-largest sub-sector. Several forward-looking policies place Vancouver at the forefront of global green building practices and technologies.

Vancouver is a fairly densely populated city with a vibrant economy. Rising housing demand implies that the buildings and construction sector will likely see significant growth in the coming years. This is significant, as currently the buildings sector accounts for over half of Vancouver's carbon emissions (City of Vancouver, 2020a). Benefiting from an electricity mix that is very low-carbon already, this leaves the buildings sector as a major potential source of emissions reduction, with a high potential for the increased uptake of renewable energy (i.e., hydroelectricity).

Vancouver's journey to 100% Renewable energy by 2050

In 2011, the Vancouver City Council approved its sustainable urban development plan, the Greenest City 2020 Action Plan (GCAP), which takes a holistic approach with goals and targets that address ecological and economic sustainability (City of Vancouver, 2011). The three main focus areas are 'zero-carbon', 'zero waste' and 'healthy ecosystems'. At the halfway-point in 2015, the City also approved two climate targets to be achieved by 2050—100 percent renewable energy, and reducing GHG emissions by 80 percent below 2007 levels, following other leading cities in climate action such as Stockholm, Copenhagen, and San Francisco (City of Vancouver, 2015).

Vancouver aims to derive 100 percent of its energy from renewable sources at the latest by 2050. The City published its Renewable City Strategy in 2015, which aims at setting the foundation for Vancouver to reach its target. The three key strategies for the renewable energy transition are to reduce energy use, to increase the use of renewable energy, and to increase its supply as well (City of Vancouver, 2015). Like other cities and local governments that have committed to a 100 percent renewable energy target, achieving it would require a deep transformation in the way energy is produced and consumed by local communities, and the use of a broad range of solutions and tools. From the 2015 baseline, where 69 percent of its energy used was sourced from fossil fuels, the City plans to achieve its target by 2050 through a variety of ways, including increasing the share of bioenergy, electrification, district (or neighborhood) energy systems, and hydrogen.

Vancouver also declared a climate emergency in 2019 along with more than 1,200 other jurisdictions worldwide (Crawford, 2019). Following the declaration, in November 2020, the City Council adopted the Climate Emergency Action Plan (CEAP), targeting emissions from transport and buildings, and capturing carbon, with a 2030 target for a

50 percent emissions reduction compared to 2007 levels, in line with findings of the United Nations Intergovernmental Panel on Climate Change (IPCC) to limit the rise in global temperatures to 1.5° C. The CEAP follows in the footsteps of the 100 percent renewables target by 2050, laid out in the city's Renewable Energy Strategy in 2015 and the GCAP, with more ambitious timelines.

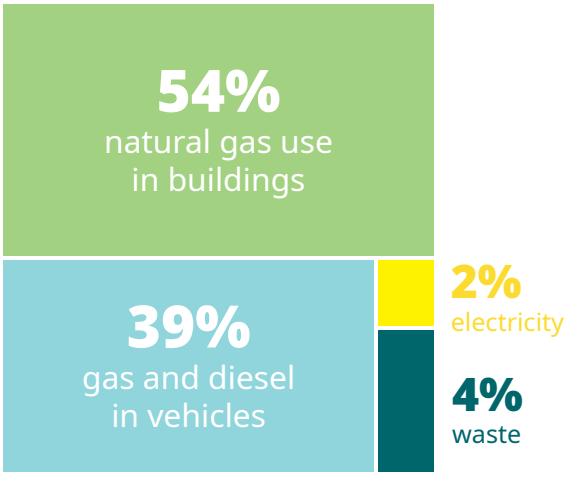


Figure 3: Sources of Vancouver's carbon emissions in 2019. Source: Vancouver CEAP

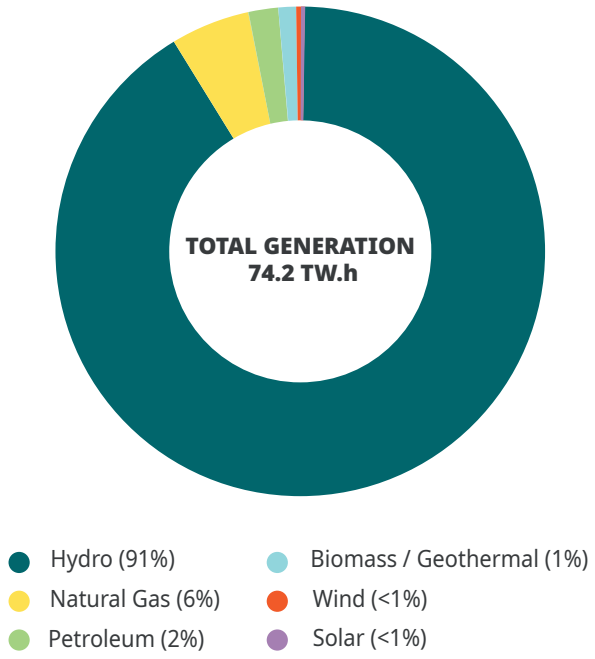


Figure 4: British Columbia's electricity generation mix in 2018 Source: Canada Energy Regulator (CER)

In 2019, Vancouver emitted over 2.5 million metric tons of carbon dioxide equivalent ($tCO_{2\text{-}eq}$) (City of Vancouver, n.d.). Its electricity sector accounts for only a small share of emissions. As per British Columbia's Clean Energy Act passed in 2010, 93 percent of the electricity in British Columbia must be derived from clean or renewable energy sources. Thanks to the abundant hydroelectricity potential in the region, more than 97 percent of the province's electricity comes from renewables. The city's most significant CO_2 emissions source was therefore natural gas used for space and water heating in the buildings sector (54%), followed by fossil fuel consumption in the transportation sector (39%).

The buildings and transportation sectors are the two major energy consumers in the city. For the former, Vancouver has significant authority to enact land use and zoning/ rezoning policies and regulate building standards, and the fact that it has its own building by-laws makes it unique in the province of British Columbia. For the latter, transitioning to renewables would involve land use and transportation planning, increasing electrification, increasing public transportation usage, and encouraging the uptake of biofuels and hydrogen where possible. An improvement in energy efficiency for both sectors is also vital to decrease the energy demand and reduce CO_2 emissions.

Therefore, in order to achieve its climate and energy targets, the buildings sector needed special attention. Buildings have to be more energy efficient and resilient, while also moving away from traditional fossil-fuel based technologies for heating and other purposes. This is of course not a problem unique to Vancouver, and a number of challenges have been encountered along the way. The long timeframes and scale of the infrastructure involved can also compound the problem. However, Vancouver has

taken a dynamic and holistic approach to tackling these problems, particularly for new buildings. The emphasis has been on continual learning while engaging a broad range of stakeholders, consistency and clarity in its approach, and on achieving specific outcomes (i.e., zero GHG emissions) without necessarily prescribing the path. This has allowed for the development of sustainable and achievable targets, with new and innovative technologies and practices.

Vancouver also recognized the need to stimulate the entire value chain to reorient itself towards more sustainable practices, materials, and technology. Early adopters need support and recognition, while others need encouragement to expand the adoption of these methods and technologies, which would continue to bring greater efficiencies across the supply chain. Providing policy certainty over a long-term horizon and aligning it with regional and national policies, as well as capacity-building efforts and consultations with the buildings and construction industry, have allowed Vancouver to set targets for new buildings that are eminently achievable for its buildings industry. Vancouver is now building on the tools and approaches it has used to shift new construction to begin accelerating retrofits.

"As a city, Vancouver has a big goal to be the world's greenest city by 2020, and being in the lead on green buildings is a key element of our plan. It's critical that we make our buildings more efficient, more green and sustainable and that, as cities, we take urgent action to mitigate the impacts of climate change through our building policy."

Gregor Robertson, Former Mayor of the City of Vancouver, 2013 (link)

A strong foundation for climate neutrality and 100% Renewables

Incentives for innovative design for new buildings

Vancouver has used catalytic tools to encourage innovation and to create a competitive zero emissions buildings market for developers, especially early adopters. The idea behind this was that innovative designs and approaches could be encouraged by reducing overall project costs for developers, streamlining the application process, removing administrative barriers, and that visible success through the implementation of projects would inform and encourage others to follow in their footsteps when planning new projects. While the range of possible incentives is quite broad, they can be adapted to suit local contexts, or even specific building types.

The permitting process could be expedited for leading developers, and some procedural requirements regarding land-division could be relaxed. Vancouver also encourages competitive mechanisms, including design competitions with cash prizes in order to bring about new design ideas.

In some cases, developers can be given density bonuses, such as increased floor space in the same amount of land, for providing public benefits such as zero emissions buildings or affordable housing. This is not to say that the city only has performance-based targets—indeed, prescriptive targets are still used for their simplicity—but such targets can also be an effective way to encourage innovation and achieve desired outcomes.

What makes an effective catalyst?

In Vancouver's experience, a number of principles can be used to guide the development and promotion of effective catalysts (City of Vancouver, 2016). These include:

- Tailoring catalyst tools to local contexts in order to be appealing to builders and developers.
- Given the timelines involved in construction, decisions about whether a developer would be able to avail of certain catalysts must be conveyed in a timely manner.
- A diversity of stakeholders across different parts of the value chain must be engaged and supported, including designers, developers and builders, in order to encourage widespread adoption.
- Catalysts must help drive demand for zero emissions buildings and associated materials and technologies, focusing on scalability and widespread applicability.
- To reduce costs overall, sufficient demand must be generated for zero emissions buildings and associated technologies to increase investment, efficiency and competition.
- There should be continuation and consistency in ZEB criteria and expectations to allow for incremental growth and learning.

Figure 5: Vancouver's VanDusen Botanical Garden Visitor Center, an LEED Platinum building, completed in 2011. Source: City of Vancouver (link)

Consistently stepping down emissions

To promote green building design and innovation, the city established two targets in the GCAP—for existing buildings to reduce energy use and GHG emissions by 20 percent against 2007 levels by 2020, and for all new buildings constructed from 2020 onwards to achieve carbon neutrality in their operations through emissions reductions or offsets. Given this context, the Zero Emissions Building Plan (ZEBP) was adopted in 2016 (City of Vancouver, 2016).

In conjunction with the Renewable City Strategy adopted in 2015, the Plan sets the target for all new buildings in the city to have zero GHG emissions by 2030. The Plan acts as a roadmap reflecting the city's willingness to undertake a major transition in the buildings sector.

The Plan mainly targets new construction in order to avoid the future costs associated with retrofitting to the maximum extent, which can also go a long way in ensuring the City reaches its 100 percent renewable energy target by 2050.

The cornerstone of the ZEBP is incrementally lowering the GHG emissions limits for new buildings in the run-up to the 2030 zero emissions target. In every milestone year, generally a five-year interval, Vancouver's Building By-law and Rezoning Policy are updated to reflect stricter GHG Intensity (GHGI) and Thermal Energy Demand Intensity (TEDI) targets. While the long-term goal is made explicit, updating regulations at a regular interval also provides certainty to developers and investors about the timeline of progress and implementation.

Harmonizing policies

Overlapping policies and jurisdictions can create confusion and uncertainty, making compliance more costly than it needs to be. Policy integration in pursuit of coherence and consistency between the various plans, strategies, and bylaws and consistency of policy elements has been a key building block of Vancouver's green building transition. A number of innovative policies and frameworks as well as supporting tools have been put in place to incentivize and regulate the zero emissions buildings sector. Vancouver has been cooperating with neighboring cities and governments at the regional and national level to reduce policy roadblocks and enable easier compliance.

For example, the ZEBP led the way for the province-wide BC Energy Step Code, that provides guidelines for local governments to incentivize or mandate energy efficiency standards for new buildings (Government of British Columbia, n.d.). The Energy Step Code was modelled on the ZEBP. Builders are able to achieve standards on a prescriptive or performance basis, the former involving meeting certain requirements for insulation, furnaces, windows, and so on, with the former allowing more flexibility in design and construction by establishing an outcome that must be achieved. A number of Vancouver's neighboring jurisdictions have also adopted similar codes, which has the advantage of increasing demand for green building technologies, bringing about greater manufacturing, greater process efficiency and therefore lowers costs overall.

In its permitting process, Vancouver also accepts industry-standard certifications. For instance, all rezoning applications made after May 2017 have been required to meet certain criteria regarding nearly zero emissions or low emissions. Nearly zero emissions buildings would be required apply for Passive House certification—an internationally recognized, performance-based standard for extremely energy-efficient buildings—or other equivalent standards such as the International Living Future Institute's Zero Energy Building Certification. In the case of low emissions buildings, all projects except residential buildings have needed to register with the Canadian Green Building Council (CaGBC) and meet the criteria of LEED Gold certification for Building Design + Construction (BD+C) or equivalent (City of Vancouver, 2010).

Figure 6: The Heights, one of the largest Passive House-certified buildings in Canada. Source: link

Figure 7: Telus Garden - 24-storey office building, LEED Platinum, solar roof. Source: link

Capacity building for stakeholders

Reaching Vancouver's ambitious goals requires the use of a wide range of existing technologies and practices, as well as the development of new ones. In order to do this, lessons learned from early adopters of these technologies and practices must be diffused across other stakeholders as well. The ZEBP therefore also supports capacity building for various actors in the green building industry in order to accelerate innovation and increase adoption of these technologies, which then has positive cascading effects for the industry as a whole. These include trainings, knowledge-sharing, and peer exchanges.

Through early-adopter incentive programs, Vancouver has been able to get leading developers to share their stories, including design ideas and challenges encountered, as well as providing public tours of their buildings. The City has also emphasized public awareness and communication campaigns in order to promote the demand for greener buildings, and the innovative work being done by developers. By working closely with the industry, Vancouver is also able to identify blockages in the regulatory framework and streamline policies to enable zero emissions buildings.

Retrofitting existing buildings

By 2050, approximately 40 percent of all buildings in Vancouver will have been built after 2020, meaning that in a business-as- usual scenario, 60 percent of buildings will continue to use conventional heating systems and emit GHGs (City of Vancouver, 2016).

Although the ZEBP mainly focuses on new construction, Vancouver's detailed Zero Emissions Buildings Retrofit Strategy (ZEB-R), as part of the CEAP, focuses on existing buildings (City of Vancouver, 2020a).

The ZEB-R strategy is multifaceted, with the overarching goal to reduce carbon pollution from existing buildings by 50 percent by 2030, with a goal of a 100 percent reduction by 2050. The plan will involve setting clear targets, supporting early action by building owners, working with other actors in the space such the buildings industry and utilities, and facilitating access to renewable energy sources [electricity, district energy, renewable natural gas] (City of Vancouver, 2020d). The Strategy involves various approaches including accelerated permitting, clear communication of targets, and phased targets .

Zero Emissions Building Exchange (ZEBx)

Launched by the Vancouver Regional Construction Association (VRCA) and the City of Vancouver in 2018, the ZEBx acts as a specialized knowledge-sharing platform for the building industry to help develop private, public, and civic sector capacities regarding zero emissions buildings.

The city has found this cooperative format of peer-learning quite effective. It provides various types of resources to support the industry and inform them about new approaches and ideas, including research reports, case studies, podcasts, dialogues and workshops.

Retrofitting existing buildings can be challenging and costly, especially the deep retrofits that may be required. Retrofits can include changing insulation and windows, switching from boilers to electric heating such as heat pumps, increasing the uptake of renewable energy through district energy, and generally improving energy efficiency. The complexity of retrofits varies by building usage type and age. While commercial and institutional buildings are able to recoup their initial investment due to improved energy cost savings, it remains a challenge to convince residential developers to undertake these costly retrofits (Zeidler, 2019). Many landlords and developers do not see a benefit from the higher energy efficiency gained from their investments, combined with a poor interest in and familiarity with emerging products.

However, increasing awareness and engagement with stakeholders to make them aware of the benefits and access to various financing mechanisms (including national-level government programs or program-specific assistance) can help tackle this reluctance. Vancouver has taken steps in this direction. For example, in 2019 the Council approved a CAD 5 million fund to help building owners take advantage of British Columbia's retrofit programs (City of Vancouver, 2019). The City has also identified various funding sources from the national level that it can tap into, and other approaches such as Property-Assessed Clean Energy (PACE) financing. Vancouver is also planning to launch various decision-support tools to aid owners, in addition to various 'accelerator centers' in partnership with industry associations to guide owners in their retrofit. Other possibilities may available include a portfolio approach, where developers are given a GHG limit for the entire portfolio, which allows for certain buildings to be below or above this limit as long as the overall portfolio meets the requirement.

Figure 8: Heat pumps. Source: BC Hydro

Leading by example

Vancouver has also chosen to serve as an example for zero emissions buildings by kick starting the transformation of its own operations. For instance, Passive House or other equivalent high energy efficiency certifications are required for all city-owned and operated facilities. The Renewable Energy Strategy for City-Owned Buildings (2016–2040) was launched in 2015, when the City owned and operated 558 buildings (Neuberger, 2016). This allows Vancouver to act faster than most private-sector developers, and act as a catalyst for bringing about its green building transformation. Through practical experience, the City would be better able to identify barriers in the regulatory framework, and policies that could be streamlined. The city can also influence the situation on the ground through its procurement process, for example by promoting competitive approaches (City of Vancouver, 2016). As part of the Climate Emergency Action Plan, the City is now also moving forward to aggressively retrofit city-owned buildings, including switching from furnaces to low-emissions heat pumps.

Southeast False Creak Neighborhood Energy Utility (NEU)

The City of Vancouver opted for district, or neighborhood, energy as a low-carbon heating (and even cooling) solution to replace natural gas usage in space and water heating in buildings in high-growth and high-density districts. The Southeast False Creek NEU was set up in 2010, and generates thermal energy from sewage and other renewable energy sources.

In 2019, the Southeast False Creek NEU delivered steam and hot water to 5.75 million sq ft of floor space to commercial and residential buildings (City of Vancouver). As the City Council has approved the expansion of district energy across the city, more buildings are expected to benefit from these city-operated NEUs in the future (City of Vancouver, 2018).

Keeping an eye towards the future

Vancouver's Climate Emergency Action Plan included six "Big Moves" to tackle the climate crisis, including "Big Move 4", which calls for a reduction by half of operational carbon emissions from buildings by 2030 compared to a 2007 baseline. "Big Move 5" calls for a 40 percent reduction in embodied emissions from new buildings by 2030 compared to a 2018 baseline level. This move is the first of its kind in North America, and refers to carbon emissions from the manufacture of the materials required in construction, including concrete, metals, foam, etc. (Canadian Architect, 2021).

Embodied emissions account for almost a third of emissions from the buildings and construction sector. Effectively, "Big Move 5" targets Scope 3 GHG emissions that are generated outside the city but are indirectly caused by its activities, such as construction. This also pushes developers to use lower-carbon materials such as wood, including prefabricated structures, reusing materials, opting for lower-carbon concrete and insulation, and so on. As with many of the policies adopted in the green buildings sector, there are significant spillover benefits, including a lower cost of construction leading to more affordable housing for residents, which is another major concern of Vancouver's buildings sector generally. Greater efficiencies also lead to lower energy bills, further increasing affordability.

Figure 9: Brock Commons Tallwood House at the University of British Columbia, one of the tallest mass timber buildings in the world, completed in 2017. Source: link

Paving the way ahead

Given the long timelines involved in building construction and planning, many of the benefits of Vancouver's zero emissions buildings will be seen over the coming years. Early signs of progress have been promising, however a lot more remains to be done, and Vancouver has responded by actively pushing for greater and faster transformations.

As mentioned earlier, Vancouver steps down GHG limits at regular intervals. As an example, according to the city's building by-law, new detached houses in Vancouver (which in 2016, represented about 44 percent of new development by area, and 90 percent of which use natural gas for heating) will be required to adopt measures such as switching to zero emissions space and water heating, leading to a 63 percent decrease in carbon pollution compared to the previous iteration of the by-law (City of Vancouver, 2020c). Larger homes would be subject to a cap of two tons of CO_2 emissions per year, down from three tons previously. For GHG intensity, beginning from a baseline of twenty-three in 2007, the limit has decreased to twelve in 2014, seven in 2020, with a target of zero in 2025. Similarly, for the TEDI, it was at 113 (2007), and has fallen from 84 (2014) to 55 (2020), with a target of thirty in 2025.

The results in Table 1, a nine percent reduction in 2020 in carbon emissions from 2007 levels come despite an increase in Vancouver's population of eleven percent in the same period (City of Vancouver, 2020a). The carbon emissions from new buildings came down to 11.8 $kgCO_{2\text{-eq}}/m^2$ in 2019, compared to 20.7 $kgCO_{2\text{-eq}}/m^2$ in 2007. This was a reduction of 43 percent, which is significant. The target in 2020 was zero emissions for new buildings. Regarding the City of Vancouver's operations, against a target of a 50 percent reduction in GHGs in city operations from a 2007 baseline, in 2019 the city had achieved a reduction of 43 percent (City of Vancouver, 2020b).

The economic impacts of Vancouver's emphasis on its green economy, and especially its buildings sector, are also significant. Green jobs in the buildings sector grew 53% between 2010 and 2016, while green jobs overall grew 35 percent in the same period (Vancouver Economic Commission, 2018). The green buildings program has allowed citizens to save CAD 44 million annually from 2007–2015. The green buildings industry itself was valued at CAD 23.45 billion, and accounted for almost 300,000 jobs in 2014.

Table 1: Vancouver's Green Buildings targets under the GCAP and progress. Source: City of Vancouver GCAP Progress Highlights and Dashboard

	Baseline (2007)	2020 Target	2019 Level	Change from baseline
Target 1: New buildings constructed from 2020 onward to be carbon neutral in operations	20.7 $kgCO_{2\text{-eq}}/m^2$	Carbon neutral (0 $kgCO_{2\text{-eq}}/m^2$)	11.8 $kgCO_{2\text{-e}}q/m^2$	-43%
Target 2: Existing buildings to reduce carbon emissions by 20% against 2007 levels	1,585 $ktCO_{2\text{-eq}}$	1,270 $ktCO_{2\text{-eq}}$	1,450 $ktCO_{2\text{-eq}}$	-9%

Lessons Learned

The City of Vancouver has been promoting the transformation of the buildings sector as one of the key pillars of the city's strategy to reach carbon neutrality and 100 percent renewable energy by the mid-century. In the process of transition, not only have the average GHG emissions from new buildings been cut by almost half, but a number of other positive outcomes have followed, including a cleaner, healthier, more prosperous and more resilient Vancouver. A number of lessons can be taken from Vancouver's process and its experience.

Encouraging innovation through catalysts and incentives

Vancouver's use of flexible catalytic tools and incentives to encourage learning and innovation has ensured all stakeholders, including developers, public officials, and communities are motivated to engage in the process for a complete transition of the entire industry. In addition to rewarding early adopters, the City has implemented outcome- or performance-based targets that prescribe the end goal (for example, zero GHG emissions), but not a specific approach, encouraging developers and designers to adopt creative and novel solutions. By meeting certain targets or standards, developers are also eligible for certain bonuses, faster permitting and so on. These tools can be customized by building type, but follow certain principles that allow for broader applicability.

Continuous learning for all stakeholders

Vancouver's approach involves continuous learning and improvement. By supporting early adopters of certain technologies and practices, the City provides a useful reference point for other developers, designers, and contractors, and any lessons learned can then become the foundation for improving policy and approaches in the future. All the knowledge, skills and information generated from these activities are also shared and exchanged via trainings, seminars, case studies, and peer-exchange network to spur innovation throughout the industry, policymaking community and beyond. Spurring the adoption of sustainable technologies and practices at such a scale increases demand, this further leads to greater efficiencies and capabilities along the value chain. Vancouver has also taken the lead in some cases, by undertaking the transformation of its own buildings and public facilities, as well as adopting new approaches such as district energy systems.

Vertical and horizontal policy integration and alignment

The energy transition requires a holistic approach across industries and various levels of government, the engagement of a variety of stakeholders beyond just industry, and a rapid pace of innovation and action. Aligning local policies with regional- or national-level policies is particularly useful in providing certainty to developers and investors in during an inherently uncertain energy transition. Pursuing the same goal with the regional (British Columbian) and national government for sustainable buildings and construction, Vancouver's green buildings policy assures stability and predictability to all stakeholders. Close alignment can streamline processes and reduce the resources required to meet various standards, making compliance across the value chain more likely. The City of Vancouver secured coherence

throughout the entire green building policy package by taking an incremental yet consistent approach, beginning with the Greenest City Action Plan (2010), Renewable City Strategy (2015), Zero Emissions Building Plan (2016), and most recently the Climate Emergency Action Plan (2020), maximizing synergies and preventing conflicts between the different objectives.

Long term horizon and target-setting

Clear long-term goals and incremental targets have given actors in the buildings sector ample time to respond and adapt to changing regulations. By giving the buildings industry policy certainty, and engaging them in the policymaking process, Vancouver has ensured that the targets set are achievable by all those concerned, and that its policies remain sustainable. For now, Vancouver is on track to reach zero emissions from new buildings by 2025, and is currently also focusing on retrofitting and upgrading existing buildings, in line with the new 2030 targets to accelerate the pace of the transition.

References

Canadian Architect. (2021, February 9). Vancouver releases plan to reduce embodied energy emissions. Retrieved from https://www.canadianarchitect.com/vancouver-releases-plan-to-reduce-embodied-energy-emissions/

City of Vancouver. (2010). Green Building Policy for Rezoning.

City of Vancouver. (2011). Greenest City Action Plan.

City of Vancouver. (2015). Greenest City Action Plan Part Two: 2015-2020.

City of Vancouver. (2015). RENEWABLE CITY STRATEGY 2015-2020. Vancouver: City of Vancouver.

City of Vancouver. (2016). Zero Emissions Building Plan.

City of Vancouver. (2018). Expansion of the False Creek Neighbourhood Energy Utility.

City of Vancouver. (2019). Greenest City Action Plan 2018-19 Implementation Update.

City of Vancouver. (2020a). Climate Emergency Action Plan Summary 2020-2025.

City of Vancouver. (2020b). Greenest City Action Plan 2019–2020 Progress Highlights and Dashboard.

City of Vancouver. (2020c). Climate Emergency Requirements for New Housing 3-Storeys and Under.

City of Vancouver. (2020d). Climate Emergency Action Plan.

City of Vancouver. (n.d.). Climate and Renewables. Retrieved from https://vancouver.ca/green-vancouver/climate-and-renewables.aspx

City of Vancouver. (n.d.). False Creek Neighbourhood Energy Utility: In-depth. Retrieved 9 2, 2021, from https://vancouver.ca/home-property-development/utility-facts-and-presentations-in-depth.aspx

Crawford, R. (2019, January 17). Vancouver City Council votes to declare 'climate emergency'. Retrieved from Global News: https://globalnews.ca/news/4856517/vancouver-city-council-votes-to-declare-climate-emergency/

Government of British Columbia. (n.d.). BC Energy Step Code Requirements. Retrieved from Energy Step Code: https://energystepcode.ca/requirements/#bcbc-2018-rev-2

International Energy Agency. (2019). Global Status Report for Buildings and Construction 2019.

International Energy Agency. (2020). Heating.

Neuberger, M. (2016). Renewable Energy Strategy for City-Owned Buildings.

Vancouver Economic Commission. (2018). State of Vancouver's Green Economy 2018.

Zeidler, M. (2019, May 27). New energy efficienct buildings aren't enough, experts say — we have to retrofit the old ones too. Retrieved from CBC: https://www.cbc.ca/news/canada/british-columbia/green-buildings-retrofits-1.5150658

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The 100% Renewables Cities and Regions Roadmap project facilitates the energy transition by raising local awareness on renewable energy sources, showcasing how local and national governments can create coordinated enabling frameworks and policies, exploring access to public and private sector finance, and building local renewable energy projects to address electricity, heating and cooling.

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