

DATE: September 23, 2020**FILE:** 5280-06**TO:** Chair and Directors
Regional District Board**FROM:** Russell Dyson
Chief Administrative OfficerSupported by Russell Dyson
Chief Administrative Officer**R. Dyson****RE: Comox Valley Regional District Residential Retrofit Market
Acceleration Strategy****Purpose**

To provide the Comox Valley Regional District (CVRD) Board with the CVRD Residential Retrofit Market Acceleration Strategy (the Strategy).

Recommendation from the Chief Administrative Officer:

THAT the Board receive the Comox Valley Regional Transition 2050 Residential Retrofit Market Acceleration Strategy as information;

AND THAT the Board authorize staff to engage municipal staff to identify opportunities for coordination and report back on implementation actions through the 2021-2025 financial planning process.

Executive Summary

- The CVRD is one of nine local governments on Vancouver Island working together as part of the Transition 2050 Residential Retrofit Acceleration Project, funded through the Federation of Canadian Municipalities (FCM), to help communities reach significant carbon emission reduction targets through residential energy retrofits.
- City Green was selected by the FCM to build a network of communities and support them in the development of long-term plans and projects contributing to a low carbon transition by 2050 as set out by the *BC Climate Change Accountability Act*.
- Transition 2050 deliverables comprise peer learning (e.g. workshops and industry outreach), strategic development (e.g. market acceleration strategy) and operational implementation (e.g. rebate programs).
- The Strategy is now complete and attached as Appendix A. The Strategy identifies priority actions for residential property owners including upgrading natural gas/oil heating systems to air source heat pumps, building envelope upgrades in natural gas /oil heated homes and energy efficiency upgrades in electrically heated homes (e.g. replace baseboard heaters with heat pumps).
- The Strategy recommends local government actions to support residential property owners undertaking retrofits such as rebate promotions, education and outreach with home owners and industry, financing, community retrofit programs and advocacy (see Appendix A for a complete list of recommendations).
- Staff are seeking Board direction to begin implementation of the Strategy, including engaging municipal staff to identify opportunities for coordination. Through the upcoming financial planning process, staff will identify these opportunities and bring forward to the board for review.

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Clayton Postings CAO, Village of Cumberland	✓

Background/Current SituationTransition 2050 Project

In September 2018, the CVRD responded to a FCM Expression of Interest for the Municipalities for Climate Innovation Program Transition 2050 Partner Grants. The CVRD joined eight other local governments on the island including the City of Campbell River, Regional District of Nanaimo, Cowichan Valley Regional District, City of Victoria, District of Saanich, Central Saanich, Capital Regional District and Township of Esquimalt to work as a collaborative network on encouraging deep energy upgrade retrofits through peer learning, strategic planning and operational implementation. The partnership also enables home owners to access home renovation rebates; some of which are “topped up” by the CVRD (i.e. heat pump installation top-up of \$350 for those switching from natural gas, oil or propane).

As a Transition 2050 partner, the CVRD has benefitted from being a part of the collaborative network through sharing similar challenges and solutions and leveraging lessons learned in addressing existing carbon reduction barriers. Strategy development workshops (one held in Courtenay in October 2019) were held throughout 2019 with industry stakeholders to provide opportunities for shared learning on the initiative and available CleanBC rebate programs. As one of the Transition 2050’s deliverables mentioned above, City Green has developed a Residential Retrofit Market Acceleration Strategy and the Strategy is attached as Appendix A. The Strategy outlines a set of strategies and actionable residential retrofit acceleration activities that can support the CVRD meeting the target of 80 per cent reduction below 2007 levels by the year 2050, with a 50 per cent reduction by 2030. The Strategy’s analysis is based on the following:

- Residential buildings in the CVRD consume 398,968 GJ in natural gas and 383,332 GJ in oil annually and those two fuel types account for 71 per cent (46,105 tonnes of CO₂e annually) of all residential emissions.
- There are 25,635 single-detached homes, semi-detached homes, row homes, other single-attached homes, and movable dwellings in the CVRD.
- Approximately 77 per cent of private dwellings in the CVRD are owner-occupied.

Given the large scale of the challenge, meeting retrofit acceleration targets will require an exponential increase in the rate, scale and depth of home energy retrofits. Meeting Canada’s 2050 net-zero target will require energy retrofits to almost every building in Canada. The Strategy highlights the significant challenges and barriers to accelerating residential retrofits at the local, regional and provincial level.

Residential Retrofit Acceleration Market Strategy Priorities and Recommendations:

To set the path forward, the Strategy identifies the following retrofit priorities:

- Acceleration of home upgrades from natural gas and oil heating systems to modern and efficient air source heat pumps.
- Acceleration of building envelope upgrades in natural gas and oil heated homes,
- Acceleration of energy efficiency measures in electrically heated homes through upgrades from baseboards and furnaces to heat pumps.
- Increasing industry capacity including opportunities for workforce development, industry training and better linking the industry to provincial programs.

To action these priorities, the Strategy recommends exploring retrofit rebate promotions to help build awareness about the benefits for home energy upgrades, incentives and education to encourage home owners to make Greenhouse Gas (GHG) reduction upgrades, financing programs to help support homeowners in financing home energy retrofits, community retrofit programs designed to leverage and advocacy. Given the trans-boundary nature of GHG emissions, it makes sense for retrofit upgrades to be a regional effort. To advance the CVRD Residential Retrofit Market Strategy, staff are seeking Board direction to work with municipalities to identify strategic and feasible implementation actions that will contribute to a community-wide reduction in GHG emissions.

Policy Analysis

The CVRD became a signatory of the *British Columbia Climate Action Charter* in 2007 and the CVRD has established a target of reducing its community emissions 80 per cent below 2007 levels by the year 2050, with a 50 per cent reduction by 2030 in both the Comox Valley Regional Growth Strategy (RGS) and the Comox Valley Sustainability Strategy. The Strategy helps set out the path to work towards meeting these target reductions.

Options

Options available are as follows:

1. Receive this staff report and the Strategy and direct staff to proceed with implementation.
2. Receive this staff report and direct an alternative action or request.

Based on the analysis above, staff recommends Option 1.

Financial Factors

The value of the contribution provided by the CVRD to the Transition 2050 project is \$6,000 as in-kind contributions as part of the RGS service. The FCM grant covered City Green's costs associated with strategy development and contractor workshop.

Legal Factors

The *British Columbia Climate Action Charter* is not legally binding, but in being a signatory, the CVRD committed to measuring and reporting community GHG emissions and creating complete, compact, more energy efficient communities. Participating in Transition 2050 will assist the CVRD in meeting part of its charter commitments.

Regional Growth Strategy Implications

The RGS being the "Comox Valley Regional District Regional Growth Strategy Bylaw No. 120, 2010" identifies the overall climate change goal of minimizing regional GHG emissions and planning for adaptation. The long-term target is an 80 per cent reduction of regional GHG emissions from 2007 levels by 2050, with a mid-term target of 50 per cent reduction by 2030. Specifically, the CVRD Residential Retrofit Market Acceleration Strategy helps the CVRD work towards the following objectives of the RGS:

- Objective 8-A: Reduce GHG emissions created by the building sector
- Objective 8-F: Plan for climate change adaptation.

Intergovernmental Factors

The CVRD worked as part of a collaborative network of local governments on Vancouver Island.

The strategy included the member municipalities: City of Courtenay, Town of Comox and the Village of Cumberland. All three member municipalities in the Comox Valley have signed the *British Columbia Climate Action Charter* and committed carbon emission reduction targets. A copy of the Strategy will be forwarded to each local government for information.

Interdepartmental Involvement

City Green is the project lead with support from the CVRD planning and development services branch. Building services have reviewed the draft and provided feedback that has been incorporated.

Citizen/Public Relations

In 2019, four Transition 2050 strategy development workshops (two workshops were held in Victoria, one held in Nanaimo and one held in Courtenay in October 2019), two contractor webinars and one public presentation were delivered. People attended and /or registered to receive event summary materials. Attendees included Transition 2050 Residential Retrofit Acceleration Project team and partners, contractors, representatives of local governments, Natural Resources Canada, BC Ministry of Energy, Mines and Petroleum Resources, BC Hydro, Fortis BC, the Home Performance Stakeholder Council and Industry Associations.

A project webpage has been created on the CVRD website with information on the Transition 2050 Project including links to rebate programs and supporting policies. Once the Strategy has been received by the Board, it will be posted on the project page for the general public and industry stakeholders.

Attachments: Appendix A – “CVRD Residential Retrofit Market Acceleration Strategy”

2020

Comox Valley Regional District **Residential Retrofit** **Market Acceleration** **Strategy**

Version 1.0

Transition 2050: Residential Retrofit Acceleration Project

Updated: August 2020

FUNDING

Funding for this strategy and for the Residential Retrofit Market Acceleration Project activities has been provided by the Federation of Canadian Municipalities, with cash and in-kind funding support from Transition 2050 local government partners, City Green Solutions, and the Home Performance Stakeholder Council. The project leads of this initiative are City Green Solutions and the Home Performance Stakeholder Council.



The Transition 2050 project is supported through the Municipalities for Climate Innovation Program, a five-year \$75-million program delivered by the [Federation of Canadian Municipalities](#) and funded by the Government of Canada.

The Transition 2050 [Residential Retrofit Market Acceleration Strategy Local Government Project Partners](#) are:

- Capital Regional District
- City of Victoria
- District of Saanich
- Township of Esquimalt
- District of Central Saanich
- City of Campbell River
- Regional District of Nanaimo
- Comox Valley Regional District
- Cowichan Valley Regional District

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EXECUTIVE SUMMARY

This Comox Valley Regional District (CVRD) Retrofit Market Acceleration Strategy (the strategy) has been developed with input from local government Transition 2050 project partners and over one hundred businesses providing home energy retrofit services in the region. This document has been developed for the CVRD¹, while similar strategy documents have been prepared for the other regional and local government project partners.

The **primary audiences** for this strategy are local governments and retrofit program stakeholders. The strategy, or components of the strategy, can also be shared with industry and other stakeholders.

This strategy is one part of the larger Transition 2050 Residential Retrofit Market Acceleration Project, which focuses on peer learning, development of actionable strategies, accelerating installation of air source heat pumps, and accelerating installation of home energy retrofits to reduce the emissions associated with the use of fossil fuels for space and water heating.

The Transition 2050 Residential Retrofit Acceleration Project Goals:

To mobilize government and industry collaboration to develop strategies and projects that will double the greenhouse gas emissions reductions achieved from residential retrofits in program communities by 2022, while establishing a clear path to achieving medium-term (2030) and 2050 targets.

CVRD Project Goals:

To identify a set of strategies and actionable residential retrofit acceleration activities that can support the CVRD to meet the target of an 80% reduction below 2007 levels by the year 2050, with a 50% reduction by 2030.

The CVRD **strategy's analysis** indicates that:

- Residential buildings in the CVRD consume 398,968 GJ in natural gas and 383,332 GJ in oil annually and those two fuel types account for 71% (46,105 tonnes of CO₂e annually) of all residential emissions.²

¹ For the purposes of this Strategy document, the CVRD boundaries are understood according to the Statistics Canada census division. This includes Electoral Areas A, B, and C, including Denman and Hornby Islands, and the municipalities of Courtenay, Comox, and Cumberland.

² Emissions data was collected from the 2017 Provincial Greenhouse Gas Emissions Inventory spreadsheet entitled "B.C. utilities energy data at the community level," accessible here:

<https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>

- There are 25,635 single-detached homes, semi-detached homes, row homes, other single-attached homes, and movable dwellings in the CVRD.³
- Approximately 77% of private dwellings in the CVRD are owner-occupied.⁴
- There are significant barriers to accelerating residential retrofits at the local, regional, and provincial level.
- Although the CVRD plays a limited role in influencing the amount and sources of energy used in buildings, the Regional District has established a target of 33% greenhouse gas reduction by 2020 and 80% reduction by 2050 below 2007 levels. This Strategy document has been designed to help the CVRD meet its climate action targets and the growing need for housing for all sectors, including low income, elderly, and renter populations.

Given the scale of the challenge, **residential retrofit market acceleration** will only be achieved by ongoing, significant, and sustained implementation of all viable acceleration strategies and actions by a diverse group of local, regional, and provincial stakeholders who take ownership over and drive forward strategy implementation. This strategy report highlights the challenges involved; it also provides a set of priorities and strategies to set the CVRD on a path to meet local climate plan and retrofit targets and to support meeting national targets.

The report identifies the following building retrofit priorities: acceleration of home upgrades from natural gas and oil heating systems to modern and efficient air source heat pumps, at time of replacement or sooner; acceleration of building envelope upgrades in natural gas and oil heated homes; and acceleration of energy efficiency measures in electrically heated homes through upgrades from baseboards and furnaces to heat pumps, along with building envelope upgrades. This report also presents strategy options in following action categories: retrofit rebate promotions; consumer engagement for low carbon home market transformation; CVRD housing needs assessment priorities; transition towards a climate ready building stock; incentives and education; financing; community retrofit programs; and advocacy.

³ Building stock data was collected from the Statistics Canada 2016 Census, accessible here:

<https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/index.cfm?Lang=E>

Additional data is available in the Comox Valley Regional District Housing Needs Assessment, released 2 July 2020. Data from the Housing Needs Assessment has the additional benefit of breaking down data between municipalities and electoral areas, and noting changes over time from 2006 to 2016, which gestures towards developing trends specific to the region.

⁴ See appendices for detailed data on emissions, building stock, and home ownership.

TERMS & ABBREVIATIONS

Terms and abbreviations used in this document include:

- (t): tonnes
- CO₂e: carbon dioxide equivalent
- CVRD: Comox Valley Regional District
- CVSS: Comox Valley Sustainability Strategy
- GHG: greenhouse gas
- GJ: gigajoules
- HNA: Housing Needs Assessment
- HPSC: Home Performance Stakeholder Council
- HVAC: Heating, Ventilation, and Air Conditioning

CONTEXT: COVID-19 & BUILDING BACK BETTER

The development of the Transition 2050 Residential Retrofit Acceleration strategies was interrupted by the onset of the COVID-19 pandemic, which introduced new challenges and, potentially, new opportunities.

One of the immediate results of the pandemic was that home energy retrofit renovations slowed to a near standstill in the spring of 2020 as people and businesses responded to the deliberate slowdown of the economy, sheltered in place, and maintained physical distance.

A second result of the pandemic was increased dialogue from local to national levels about the imperative need to adequately prepare for large societal challenges and threats, like climate change. The collective Canadian response to the pandemic demonstrated that Canadians can, at least temporarily, pivot and dramatically change our lifestyles, the way we work, and the way we think about addressing economic vulnerabilities. Leveraging this ability to pivot will be central to our collective ability to seriously address climate change.

A third emerging result of the pandemic is discussions about how short-term economic stimulus and other investments in recovery could be aligned with a framework for a long-term durable and resilient recovery that would put Canada on a path to tackle climate change. Conversations about 'building back better' have become a focal point and may provide the kickstart needed to strengthen existing and introduce new greenhouse gas reducing measures to exceed Canada's 2030 emissions reduction goal and begin work so that Canada can achieve net-zero emissions by 2050.

Meeting Canada's 2050 net-zero emissions target will require energy retrofits to almost every building in Canada. Rising to this challenge will require accelerating the scale, pace, and depth of retrofits and leveraging all existing public and private sector retrofit acceleration investments and strategies.

In response to the ongoing COVID-19 pandemic, the federal government has announced that it will be allocating considerable infrastructure funds to stimulate the Canadian economy. The government has allocated over \$180 billion over 12 years for Canadian infrastructure, funds which are being prepared for distribution in response to the economic downturn caused by COVID-19. The federal *Investing in Canada* plan is based on three objectives: creating long-term economic growth; supporting a low carbon, green economy; and building inclusive communities.

While the details of the federal stimulus funding as related to residential retrofits are as-yet unavailable, it is expected that these federal investments will considerably increase the potential of the Vancouver Island community residential retrofit acceleration strategies to succeed.

THE CHALLENGE

Clear and progressive greenhouse gas reduction targets have been established and meeting them will require overcoming large and complicated barriers which, for the purposes of this report, have been classified as market acceleration barriers and ‘dragons of inaction’ barriers.

Market Accelerator: Barriers

Identifying and prioritizing barriers to acceleration of residential retrofits

45 distinct potential barriers to accelerating residential heat pump installations and 40 distinct potential barriers to accelerating residential retrofits have been identified and segmented into the following categories: Scale of the Challenge, Economic, Awareness and Acceptance, Access and Capacity, Rental Housing and Demographic, and Complexity and Other.

While many of the identified barriers are important, these six significant barrier categories were identified by industry and local government stakeholders in Strategy Development Workshops.

Barrier Type	Description
Scale of the Challenge Barrier	<p>The scale of the challenge is large. Residential retrofit rebate programs have delivered very low uptake in BC in the last six years. Current budgets and targets for rebate programs are not enough to put the province on track to meet 2030 greenhouse gas reduction targets.</p> <p>Meeting retrofit acceleration targets will require an exponential increase in the rate, scale, and depth of home energy retrofits in each community and across the province starting in 2020. Meeting Canada’s 2050 net-zero emissions target will require energy retrofits to almost every building in Canada.</p>
Economic Barriers	<p>Heat pump barrier: natural gas is cheaper than electricity. Electricity prices seem to be increasing faster than natural gas prices. There is an assumption that it will be more expensive to heat a home with a heat pump, at present and in the future.</p>
	<p>Heat pump barrier: initial heat pump purchase price. There is often a higher upfront capital cost for upgrading a heating system to a heat pump as compared to upgrading to a natural gas heating system. This includes the potential cost of upgrading the electrical panel and other electrical in/to the home to enable the heat pump installation. The cost is lower and the ease greater at the time of replacement for an oil or natural gas system.</p>
	<p>Deep retrofit affordability. The total cost of deeper energy retrofits will often be more than most homeowners are willing to spend in a short time frame. Willingness to make deeper investments in home retrofits may require effective mechanisms for homeowners to finance the retrofit and demonstrate the improved home market value that results from their effort and investment.</p>
	<p>Overall affordability: Inability of lower income households to afford retrofits.</p>
	<p>Contractual restrictions: Homeowners who have signed rental contracts with oil heating fuel companies to rent oil tanks/heating systems face financial penalties and other barriers such as long notice periods that create a financial disincentive to switching off of oil and onto heat pumps.</p>

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Awareness and Acceptance Barriers	Low level of consumer awareness and lack of understanding about heat pumps, including how they operate, the purchase price, the ongoing operational costs, and the multiple consumer benefits of heat pump systems. Additionally, there are many consumer misconceptions about heat pumps, including noise, level of heating, and cost of heating.
	Low level of consumer awareness and lack of understanding about home energy retrofit opportunities, the rebates available, and the multiple benefits of improving the energy efficiency of a home.
	Consumers don't understand the big picture 'why' they should fuel switch to a heat pump or undertake a deep energy retrofit. Contractors and other stakeholders don't have the knowledge and messaging to provide a clear and compelling 'why you should do this' message to homeowners that highlights the climate imperative of low carbon home retrofits.
	Professionals such as realtors, building permit officials, home inspectors, and appraisers lack awareness and tools to present good information about the benefits of energy efficiency to their customers and clients.
Consumer Access and Industry Capacity Barriers	Limited access: in the case of some high efficiency products that are rebate-eligible (windows with a metric U-Factor of 1.22 (W/m ² ·K) or lower and heat pump hot water heaters) there are very few contractors actively selling these products, challenges for consumers to find those few contractors, and no mechanisms to direct consumers to those few contractors.
	Reliable access: consumers don't know where to find a good/qualified contractor.
	Current capacity for acceleration: there likely are currently not enough contractor businesses, with sufficient staff, in the market to deliver significant retrofit acceleration. Substantially accelerating the adoption of retrofits will require an increased number of trained professionals operating in the province, from wholesalers to salespeople, installers, and service technicians.
Rental Housing and Demographic Challenges	Barrier for renters: Split incentive where renters pay energy bills, but owners pay for retrofits. Owners may not be willing to invest in retrofits and renters may have no options for lowering their energy bills, improving home comfort, or reducing their greenhouse gas footprint associated with space and water heating.
	Low-medium income barrier. Residents with low to medium incomes may be unable to pursue large retrofits due to competing financial pressures and high-cost living.
Complexity and Other Barriers	The complexity of the retrofit process. In the absence of an integrated home energy performance industry (whole home contractors that provide all home energy improvement services) and with no required energy evaluation for rebate programs, there are a) no industry stakeholders that can support homeowners to identify all the energy improvement opportunities in the home, b) challenges for homeowners to know where to start, to work with multiple contractors, and to sequence home energy improvements, and c) limited third-party dedicated support options for homeowners navigating the retrofit process.
	Hazardous materials disposal costs and other challenges. Hazardous materials (for example, lead paint and asbestos) disposal can dramatically increase the costs and complexity of undertaking energy retrofits in some homes. The cost associated with proper oil tank removal and decommissioning represents another barrier.
Psychological Barriers that Limit Climate Change Mitigation & Adaptation	Robert Gifford's 'The Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation' presents an important academic framework for identifying and addressing seven key physiological barriers to widespread adoption of heat pumps and other residential retrofits: limited cognition (lack of knowledge); ideological worldviews that tend to preclude pro-environmental attitudes and behaviour; comparisons with key other people; sunk costs and behavioral momentum; discredence toward experts and authorities; perceived

	risks of change; and positive but inadequate behavior change. See Appendix III for a detailed description of the Dragons of Inaction framework.
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TARGETS, PRIORITIES, & STRATEGIES

There are many stakeholders who will be involved in implementing residential retrofit acceleration strategies. Based on the established targets they are working towards, their mandate, and their capacity, each stakeholder group will have a key role to play in providing the foundation for, and in implementing, residential retrofit acceleration activities. There is a strong opportunity and essential need for cooperation and collaboration on the development and delivery of strategies.

The strategies presented in this report are the result of: an extensive period of local government and industry consultation on barriers and opportunities for retrofit acceleration; an investigation into the retrofits necessary to deliver greenhouse gas emission reductions; an exploration of the relevant targets; an analysis of the local building stock, emissions inventories, and demographics; and an assessment of the local industry capacity for delivering to the retrofit acceleration strategy.

See the attached appendices for a full summary of the work that supports this strategy. Appendix 1: CVRD Context provides more information on the specific policies that support this initiative and carbon emissions reduction targets.

The CVRD strategies, as outlined below, will be framed by local, provincial, and federal targets and guided by key residential retrofit priorities.

GHG REDUCTION AND RETROFIT TARGETS	
Federal Target	Under the Paris Agreement, Canada committed to reducing its GHG emissions by 30% below 2005 levels by 2030. Canada has also stated it will develop a plan to set Canada on a path to achieve a prosperous net-zero emissions future by 2050.
Provincial Target	British Columbia GHG reduction targets are relative to emission levels in 2007 and include reductions of 40 per cent by 2030, 60 per cent by 2040, and 80 per cent by 2050.
CVRD GHG Emissions Reduction Target ⁵	Long-term target of 80 percent reduction of GHG emissions from 2007 levels by 2050, with a mid-term target of 50 percent reduction by 2030.
Residential Retrofit Acceleration Project Targets	<ul style="list-style-type: none"> • Double greenhouse gas emissions reductions from residential retrofits in the region by 2022. • Support and advocate for the implementation of strategies that result in energy retrofits to 3% of homes in the district each year.

RETROFIT ACCELERATION PRIORITIES	
Priority 1	Acceleration of home upgrades from natural gas and oil heating systems to modern and efficient air source heat pumps, at time of replacement or sooner.
Priority 2	Acceleration of building envelope upgrades in natural gas and oil heated homes.

⁵ Target identified in the Comox Valley Sustainability Strategy. 2010.
https://www.comoxvalleyrd.ca/sites/default/files/docs/Projects-Initiatives/1rs_cvsustainabilitystrategy_18feb2010.pdf

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Priority 3	Acceleration of energy efficiency measures in electrically heated homes through upgrades from electric baseboards and furnaces to heat pumps, along with building envelope upgrades.
Priority 4	Increasing industry retrofit capacity: an important outcome of the industry input from the Residential Retrofits Acceleration Strategy development workshops was the input received regarding retrofit industry capacity. As indicated above, opportunities include workforce development, industry training, and better linking the industry to provincial programs.

CVRD RETROFIT ACCELERATION STRATEGY OPPORTUNITIES TO REACH 3% HOMES PER YEAR			
Action	Details	Status	Acceleration Investment
Retrofit Rebate Promotions	Utilize all available local and regional government channels to build awareness about the benefits for home energy and GHG reduction upgrades and the rebates and supports available. Select as many options from the local government rebate program marketing tool kit as possible to implement on a continual basis.	Expand and Enhance Existing Promotions	Increase staff time exclusively focused on residential retrofits and dedicate sufficient budget for continual and sustained rebate program promotions and related engagement.
Consumer Engagement for Low Carbon Home Market Transformation	Endorse and support the (pending) Switch It Up program, administered by the Canadian Physicians for the Environment. Leverage the consumer engagement and education campaign designed to raise awareness about the health and climate risks associated with the production and residential combustion of natural gas and oil in British Columbia and to drive market demand for zero-emissions all-electric home heating and cooking technologies.	New Program Option	Endorse Switch It Up . Leverage and support the consumer engagement campaign activities within the CVRD.
CVRD Housing Needs Assessment Priority	Promote the utility and provincial residential retrofit programs that are available for homes/residents that fall below the after-tax Low-Income Measure (LIM).	Promote Existing Program	Integrate promotion of programs for lower income homes into regional retrofit rebate program promotions.
CVRD Housing Needs Assessment Priority	To address regional need for affordable rental housing, investigate policies, programs, and incentives that can encourage energy retrofits along with upgrades to homes for aging in place and the development of secondary suites for rental or in-law accommodations.	New Policies, Programs, and Rebates Options	Explore and implement all viable policy, regulation, and program options that provide the co-benefits of increasing rental and age-in-place housing and improving home efficiency.
Transition Towards a Climate Ready Building Stock	Build awareness and implement programs and policies that result in retrofitting of homes for changing climate conditions and reducing exposure to climate hazards. Key strategies include	New Policies, Programs, and Rebates	Explore and implement all viable policies and programs to improve residential home

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	education and introducing procedures, regulations and policies to advance improving the building envelope for household resilience, and switching to heat pumps for providing air conditioning for hotter weather.	Options	resilience.
Incentives	Continue providing a financial top-up (administered through cleanBC) for CVRD residents to accelerate uptake of the provincial heat pump fuel switch rebates (for homeowners upgrading from oil or natural gas heating to a heat pump) and for EnerGuide home evaluations in the region. Explore other top up opportunities.	Continue Top-Up Rebate Option	Dedicate future budget for clean BC top-up rebates, in particular the heat pump top-up rebate (\$250-\$350).
Incentives/ Education	Continue to look for additional funding opportunities through the Wood Smoke Reduction Program, beyond what is provided by the Ministry of Environment/BC Lung, to further incentivize the switch from woodstoves to electric heat pumps. Continue to provide education through this program on the benefits of choosing an electric heat pump over a propane, natural gas, or pellet stove.	Continue Top-Up Rebate Enhance Education	Dedicate staff time to applying for additional grant opportunities for heat pump top-up rebates and increase education specifically about the benefits of heat pumps.
Financing	Investigate the impact and feasibility of developing a property assessed clean energy (PACE) program to support homeowners in accessing financing for home energy retrofits.	Undertake a Feasibility Study	Access funding for feasibility study. If program is viable in region, implement and integrate into residential retrofit acceleration strategy.
Community Retrofit Program	Consider developing and implementing a regional Community Retrofit Program designed to leverage existing rebate programs, engage citizens through a regional marketing and education campaign, build awareness, and accelerate retrofits. Program could include targeted outreach and engagement, free Virtual Home Energy Check Ups, EnerGuide Energy Evaluations, Energy Expert support services, testimonial and community champion series, neighbourhood engagement activities, and the regular introduction of new innovative offers.	New Program Option	Active staff engagement to support program promotions and program evolution with a goal of high level of Comox Valley homeowner engagement.
Advocacy	Actively advocate for other levels of government (federal, provincial, regional) to provide funding and implementation support to advance policies, programs, and marketing to accelerate retrofits (including all items outlined in the federal, provincial, and regional residential retrofit acceleration strategies chart).	Prioritize	Staff and elected officials prioritize efforts to actively advocate for other levels of government to support and implement large scale residential retrofit programs and initiatives.

Because the CVRD plays a limited role in influencing the amount and sources of energy used in homes and buildings and because of the immense challenge of meeting greenhouse gas reduction targets, all efforts in the CVRD will need to be complemented by a suite of complementary, sustained, and significant federal, provincial, and local government policy measures and financial investments that will stimulate both an acceleration of residential retrofits and a market transformation for low carbon homes. But because the CVRD cannot rely only on the activities of other levels of government, it is essential to emphasize that significant staff time and financial resources will need to be invested by the CVRD to meet residential retrofit acceleration and greenhouse gas emission reduction targets.

LEVERAGE FEDERAL, PROVINCIAL, AND REGIONAL RESIDENTIAL RETROFIT ACCELERATION STRATEGIES	
FEDERAL	
2020 Investing in Canada Plan	<ul style="list-style-type: none"> The federal plan for supporting economic recovery post COVID-19, titled the Investing in Canada Plan, is based on three objectives: creating long-term economic growth; supporting a low carbon, green economy; and building inclusive communities. While no details are currently available on how this plan and the corresponding financial investments will support residential retrofit acceleration, it is anticipated that this federal funding will be essential for meeting national and local government greenhouse gas emission reduction targets.
2019 Federal Mandate Letters	<ul style="list-style-type: none"> Operationalize a plan to help Canadians make their homes more energy efficient and climate resilient. This will include providing free energy audits to homeowners and landlords, up to \$40,000 in interest-free lending for retrofits that will save Canadians money on their energy use, a cash incentive for borrowers to maximize their energy savings, and creating a Net Zero Homes Grant of up to \$5,000 for newly built homes that are certified net zero-emissions.⁶ Implement the Pan-Canadian Framework on Clean Growth and Climate Change, while strengthening existing and introducing new greenhouse gas reducing measures to exceed Canada's 2030 emissions reduction goal; beginning work so that Canada can achieve net-zero emissions by 2050. Setting legally binding five-year emissions-reduction milestones based on the advice of experts and consultations with Canadians.⁷
PROVINCIAL	
Market Transformation Activities	<ul style="list-style-type: none"> Regulate home energy and GHG labelling; Implement a model retrofit code with greenhouse gas reduction priorities; Set and establish GHG requirements for existing buildings; Support massive scale consumer engagement on the benefits of electrification and deep retrofits; Review and increase Carbon Tax; Expand provincial heat pump rebate and financing programs to meet cost competitiveness; Adjust program design of CleanBC rebate program to enable whole home and deep energy retrofits; Establish a central role for BC Hydro, review and update utility rates to support electrification,

⁶ Minister of Natural Resources Mandate Letter. 13 December 2019. <https://pm.gc.ca/en/mandate-letters/2019/12/13/minister-natural-resources-mandate-letter>

⁷ Minister of Environment and Climate Change Mandate Letter. 13 December 2019. <https://pm.gc.ca/en/mandate-letters/2019/12/13/minister-environment-and-climate-change-mandate-letter>

Residential Retrofit Market Acceleration Strategy

	<p>and build BC Hydro staff capacity (marketing, contractors support, rebate program administration) to support acceleration of electrification;</p> <ul style="list-style-type: none">• Expand industry capacity through provision of clear market signals and robust support for industry training and capacity building;• Implement the BC Electrification Road Map; and• Provide a residential retrofit reporting framework that is publicly available and updated quarterly.
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Residential Retrofits Prioritized by Greenhouse Gas Reduction Potential

The above-mentioned strategies highlight the types of programs, policies, and initiatives that need to be advanced to accelerate residential retrofits. It is also important to highlight the specific priorities for home energy retrofits that need to be undertaken at the household level to achieve greenhouse gas emission reductions. While the greenhouse gas reduction potential of any energy retrofit in a home can be variable depending on space and water heating fuel source, size and location of home, occupant behaviour, and pre-existing efficiency of the home, the following list of retrofits has been prioritized based on analysis of the average or general modelled greenhouse gas reduction potential from homes that have participated in previous retrofit programs.⁸ With each energy retrofit option it is generally best practice to combine with other whole-home retrofits to maximize energy savings, GHG reduction, comfort, and healthy-home benefits.

Retrofit Type	Retrofit Opportunity	Upgrade To	Benefits of Retrofits Maximized When Combined with The Following Additional Retrofits
Fuel or System Switch ⁹	Oil Furnace or Boiler	Electric Air Source Heat Pump	Air Sealing, Insulation, Windows
	Gas Furnace or boiler	Electric Air Source Heat Pump	
	Natural Gas Fireplace (when used as primary heat source)	Ductless Electric Air Source Heat Pump	
Combined With/OR Deep Multiple Residential Retrofit			
Building Envelope	Un-insulated or Partially Wall Insulation	Upgrade to as High R-Value as Recommended by Contractor	Air Sealing, Ventilation, Heating System, Windows
	Foundation Insulation	Upgrade to as High R-Value as Recommended by Contractor	Air Sealing, Ventilation, Heating System, Windows
Other Space and Water Heating	Gas Water Heating	Standard Electric or Air Source Heat Pump Water Heater	High Efficiency Water Fixtures, Other Upgrades
	Gas Fireplace (used as secondary heat source or decorative) ¹⁰	Minimize Use for Primary Heating. Remove, Decommission, or	Air Sealing, Insulation, Heating System, Windows

⁸ City of Vancouver, EnerGuide Rating System Existing Homes Data Analysis, City Green, September 2015; and City of Vancouver, Energy and GHG Archetype Home Project – Summary Report, City Green, November 2018.

⁹ Along with fuels switch acceleration programs new initiatives should be introduced to address proper handling and disposal of used refrigerants from heat pumps.

¹⁰ The prioritization of gas fireplaces has been estimated; further analysis is ongoing.

		Upgrade to High-end Decorative Electric Fireplace	
Building Envelope	Window and Door Upgrades	Highest Efficiency Windows Possible	Air Sealing and Ventilation
	Air Sealing/Draft Proofing	Moderate to Deep Air Sealing Guided by Best Practices	Ventilation, Insulation, Heating System, Windows
	Ceiling Insulation	Upgrade to as High R-Value as Recommended by Contractor	Air Sealing, Heating System, Windows
Electrically Heated Homes - Space and Water Heating			
Space and Water Heating	Electric Baseboard or Furnace	Electric Air Source Heat Pump	Air Sealing, Insulation Windows
	Electric Hot Water Heater	Air Source Heat Pump Hot Water Heater	High Efficiency Water Fixtures, Other Upgrades, Other Upgrades

The prioritization of greenhouse gas reduction potential from different types of residential retrofits provides a clear path to what needs to be achieved in the Strategy.

Priority 1: Upgrading oil heating and natural gas heating systems with air source heat pumps

These represent two of the single greatest energy upgrades for delivering household greenhouse gas emission reductions. Modelled data shows average greenhouse gas emission reductions of up to 96% for homes that switch from natural gas or oil heating to a heat pump. Importantly, for homes that switch from natural gas to a heat pump, building envelope upgrades are recommended to allow the home to maintain annual heating bill costs that are comparable to or lower than a natural gas heated home and to maximize the comfort and other benefits of an energy efficient home.

Priority 2: Building envelope upgrades in oil and natural gas heated homes

Without fuel switching, building envelope upgrades have a very important role to play in reducing annual fuel costs and in achieving GHG emission reductions. Moderate to deep energy retrofits on natural gas-heated homes can potentially deliver significant greenhouse gas emission reductions.

- In homes constructed prior to 2001, moderate to deep building envelope upgrades can deliver modelled GHG emission reductions of 45% to 65%.
- Homes built from 2001 onward already possess more efficient building envelopes, and deep retrofits can deliver 8% to 12% modelled reductions in GHG emissions.

- Very deep retrofits on natural gas homes have the potential to reduce GHG emissions by over 70% in older houses.¹¹

Priority 3: Improving efficiency in electrically heated homes

While energy retrofits to electrically heated homes deliver lower to modest greenhouse gas emission reductions, they are important to:

- Allow homeowners to achieve or maintain energy bills that are comparable with, or lower than, those of homes heated by natural gas.
- Bring homeowners all the benefits of an energy efficient home.
- Cumulatively reduce total electricity energy consumption in the province, ensuring enough electricity capacity for larger scale electrification of homes and vehicles.

Priority 4: Increasing retrofit industry capacity

An important outcome of the industry input from the Residential Retrofits Acceleration Strategy development workshops was the input received regarding retrofit industry capacity. As indicated above, opportunities include workforce development, industry training, and better linking the industry to provincial programs.

A core deliverable of the Residential Retrofit Acceleration Project is to create a database of all residential retrofit contractors in the region. This database will serve the following purposes:

- Provide information that enables us to begin to understand the size and capacity of the industry.
- Have business contact information that enables two-way communications with each of the specific businesses in the industry. This information will be used to invite industry to participate in retrofit acceleration discussions and to participate in peer learning and training initiatives.
- Track the growth of the industry over time, which can inform local government understanding of the job creation benefits of residential retrofit market acceleration initiatives.
- Increase the number of skilled individuals working in the residential retrofit industry in the region.

¹¹ City of Vancouver, EnerGuide Rating System Existing Homes Data Analysis, City Green Solution, September 2015; and City of Vancouver, Energy and GHG Archetype Home Project – Summary Report, City Green Solutions, November 2018.

Performance Indicators and Reporting

One of the goals of the Residential Retrofit Acceleration Project is to develop a reporting framework that will allow local government partners to access a residential retrofit report annually, which will comprehensively track the number and types of residential retrofits that have occurred within their community and reliably report on the associated energy savings and greenhouse gas emissions reductions. The following reporting framework is a suggested template for accomplishing this goal.

It is important to note that the ability of a local government to report on residential retrofits in any given community is dependent on the willingness of the province and the utilities to disclose information about participation in the various rebate programs in a usable format.¹² One of the strategy options in this report will be for the CVRD and partner local governments to advocate to the province and utilities for a reliable framework for disclosure of information on residential retrofits and the associated energy savings and greenhouse gas emissions reductions to local governments annually.

An enabling path for this residential retrofit reporting framework may have potential to be sought through the Climate Change Accountability Act. In November 2019, the Province of BC introduced important amendments to the Climate Change Accountability Act that strengthen the Province's commitment to accountability and transparency and follow through on key CleanBC commitments. The Act states: "The proposed amendments will require government to establish an advisory committee to provide feedback on CleanBC initiatives; table a detailed CleanBC accountability report annually in the legislature starting in 2020; set an interim target on the path to our 2030 province-wide target by December 31, 2020; and set 2030 sectoral targets by March 31, 2021, following engagement with stakeholders, Indigenous peoples, and local governments."¹³

¹² Retrofits undertaken by homeowners not participating in a rebate program would not be tracked unless governments established an alternative process to track energy retrofits, for example through renovation permits.

¹³ Stakeholder email communication from Nathaniel Gosman, "CleanBC Update - Climate Change Accountability Act Amendments," October 31, 2019 and <https://news.gov.bc.ca/releases/2019ENV0110-002082>

The Annual Residential Retrofit Reporting Framework

This proposed annual retrofit tracking report framework is intended to give a snapshot summary of how retrofits could be tracked, at a community and provincial level, on a quarterly and annual basis. It is important to note that this residential reporting framework *does not currently exist* and the data to populate the framework may not be being collected. Local governments need to advocate to the province and utilities to provide a reporting framework. Among the many questions to be answered about this type of reporting framework would be:

- Who is responsible for funding the reporting framework?
- Who would administer the framework?
- How would energy savings and greenhouse gas emissions be quantified (deemed savings or modelled savings)?

EXAMPLE: 2020 Residential Retrofit Summary

2020 Residential Retrofit Summary				
Municipality / Electoral Area	Number of Homes Upgraded 2020	Energy Savings (Gigajoules)	GHG Savings (t CO2e)	% of Homes in Municipality (Baseline Year)
Comox				
Courtenay				
Cumberland				
Electoral Area A				
Electoral Area B				
Electoral Area C				
Total				

EXAMPLE: Residential Retrofit Tracker

CVRD – RESIDENTIAL RETROFIT TRACKER						
Upgrade Type	Upgrade	2020 Total Homes Upgrade Count	2020 Upgrade Count	Previous Year Home Count	Previous Year Upgrade Count	% of Eligible Homes
Building Envelope	Draftproofing	#				
	Windows – Tier 1					
	Windows – Tier 2					
	Exterior Wall Insulation - Cavity					
	Exterior Wall Insulation - Sheathing					
	Ceiling/Attic Insulation					

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	Basement/Crawl Space Insulation					
	Other Insulation					
Switch from Natural Gas, Propane or Oil To Electric Heat Pump	Mini-Split Heat Pump or Multi-Split Heat Pump	#				
	Central Ducted "Tier 2" Heat Pump					
	Central Ducted "Tier 1" Heat Pump					
	Air-to-Water Hydronics Heat Pump System					
	Combined Space and Hot Water Heat Pump					
Upgrade Your Electric Heating	Mini-Split Heat Pump					
	Multi-Split Heat Pump					
	Central Ducted "Tier 2" Heat Pump					
Upgrade Your Natural Gas Heating	Natural Gas Furnace					
	Natural Gas Boiler					
	Natural Gas Combination Heating and Hot Water System					
Water Heating	Natural Gas Storage Tank Water Heater					
	Natural Gas Tankless (On-Demand) Water Heater					
	Electric Heat Pump Water Heater					
Windows and Doors	Tier 2 Product					
	Tier 1 Product					
Insulation	Attic					
	Basement/ Crawl Space					
	Exterior Wall Cavity					
	Exterior Wall Sheathing					
	Other					
Secondary Space Heating	Natural Gas Fireplace Replacement					
Appliances	Refrigerator, Washer, or Dryer					

CONCLUSION AND NEXT STEPS

This document provides the context and background that frames the Residential Retrofit Market Acceleration Strategy Framework (Strategy Framework). The strategies outlined within the document are designed to be evergreen, flexible, and adaptable and to be used as a guide to inform retrofit acceleration activities that can be implemented by the CVRD.

Next Steps Include:

1. Engaging industry and other stakeholders who contributed to the development of this strategy document and framework to enable open two-way communication about the presented strategy options. This engagement could include online presentations and discussions about the strategy as presented, regular updates on related Comox Valley activities, and ongoing requests for industry feedback and input on how to accelerate residential retrofits.
2. Continuing to implement short-term strategy options.
3. Maximizing actions to leverage existing provincial, utility, and other stakeholder programs.
4. Maintaining flexibility to scale and shift the focus of the strategies over time in order to take advantage of new information, initiatives, and strategy options.
5. Actively working with stakeholders to create a suite of market transformation strategies that are not dependent on short term financial incentives, in order to lock in and accelerate a market transformation where low carbon and energy efficient homes become the preferred and sustainable practice in the region.

The CVRD is among the local governments on Vancouver Island that are seeking to identify and implement the most effective strategies for accelerating the market for residential retrofits. Due to the high percentage of the building stock that is energy-inefficient, the large number of homes still heated by oil and natural gas, the existing incentives from both the Province and the utilities, and the current opportunity for greater potential for federal and provincial investment post-COVID-19, the time for local governments to act to strengthen the energy efficiency industry and encourage homeowner, renter, and tenant participation in energy saving retrofits is now. The crisis of climate change is at the forefront of the national and global consciousness and the opportunity presents itself to help citizens understand the power that they have to make practical change by improving the energy efficiency of our buildings.

As aforementioned, residential retrofit market acceleration brings about myriad benefits: cost effective, clean energy; lower greenhouse gas emissions; local job creation; increased energy security; community resilience in the face of climate change; and improved health and comfort for Vancouver Island residents. The establishment of this residential retrofit acceleration strategy is just a first step toward our transition to a just and sustainable economy, but it is a crucial one.

APPENDICES: CONTEXT & SUPPORTING DATA

Appendix I: Context

Federal Context

In December of 2019, the newly elected Liberal government released mandate letters for each cabinet minister. These mandate letters outline the policy objectives each minister will work towards over the coming years. The policy objectives relating to residential energy efficiency include:

- Advance legislation to support the future and livelihood of workers and their communities in the transition to a low-carbon global economy.
- Operationalize a plan to help Canadians make their homes more energy efficient and climate resilient. This will include:
 - providing free energy audits to homeowners and landlords;
 - up to \$40,000 in interest-free lending for retrofits that will save Canadians money on their energy use;
 - a cash incentive for borrowers to maximize their energy savings; and
 - creating a Net Zero Homes Grant of up to \$5,000 for newly built homes that are certified net zero-emissions.
- Make Energy Star certification mandatory for all new home appliances starting in 2022.
- Launch a national competition to create four long-term funds to help attract private capital that can be used for deep retrofits of large buildings such as office towers.
- Support the transition of Indigenous communities from reliance on diesel-fueled power to clean, renewable, and reliable energy by 2030.
- Implement the Pan-Canadian Framework on Clean Growth and Climate Change; strengthen existing and introduce new greenhouse gas-reducing measures to exceed Canada's 2030 emissions reduction goal; begin work so that Canada can achieve net-zero emissions by 2050.
- Invest in skills training to ensure that there are enough qualified workers to support energy audits, retrofits, and net zero home construction.
- Lead government-wide efforts to develop a plan to set Canada on a path to achieve a prosperous net-zero emissions future by 2050. This includes:
 - Setting legally binding five-year emissions-reduction milestones based on the advice of experts and on consultations with Canadians; and
 - Positioning Canada as a global leader in clean technology.

The details and timelines for introduction of these potential programs are pending. The opportunity for Transition 2050 – Residential Retrofit Acceleration to access these programs has been incorporated into the Residential Retrofit Market Acceleration Framework.

Provincial Context: CleanBC

It is significant to acknowledge that the Strategy functions within the context of the Province of British Columbia's climate action policies, the Province's legacy of incentive programs, and its current retrofit and emissions reduction targets and residential retrofit programs. In many cases, homeowner uptake of residential retrofits has been and will continue to be motivated by incentives offered by the provincial government and utilities and influenced by the messaging promulgated by the Province.

Historically, the Province of BC has experienced a higher level of home energy improvements as compared with what is currently occurring. In 2009, the combination of provincial and federal incentives, high levels of consumer awareness about rebate programs, and massive mobilization of energy advisors and home energy performance contractors led to consumer participation in rebate programs at a rate of over 2,500 homes per month (representing 3% of the target residential building stock in the province). Between 2008 and April 2011, over 45,000 households purchased an air source heat pump. Although the design and structure of rebate programs, the involvement of the federal government, the products eligible to receive rebates, and other program elements are different now than they were in the past, the current CleanBC targets, policies, and programs, complemented by utility, regional, and local government involvement, provide a province-level foundation from which to accelerate residential retrofits to the same or higher levels.

The 2018 report entitled 'CleanBC: our nature. our power. our future' states: "CleanBC is a pathway to a more prosperous, balanced, and sustainable future. Over the next decade and beyond, we must grow the use of clean and renewable energy in how we get around, heat our homes, and our fuel industry – making things better and more affordable for people."¹⁴

The 2019 Climate Change Accountability Act establishes concrete targets for GHG emission reductions. Compared to 2007 levels, the Province of BC is now committed to reductions of:

- 40 percent by 2030,
- 60 percent by 2040, and
- 80 percent by 2050."¹⁵

¹⁴ cleanBC: our nature. our power. our future. (2018) p5 https://www2.gov.bc.ca/assets/gov/environment/climate-change/action/cleanbc/cleanbc_2018-bc-climate-strategy.pdf

¹⁵ Climate Change Accountability Act 2019.
http://www.bclaws.ca/EPLibraries/bclaws_new/document/ID/freeside/00_07042_01

CleanBC Home and Buildings Plan

For the buildings where British Columbians live and work, the CleanBC plan is to raise standards for new construction and encourage energy-saving improvements in existing homes and workplaces.¹⁶

By 2030, the CleanBC plan envisions the following results from residential retrofits:

- 160,000 new residential heat pumps for space heating instead of natural gas furnaces: a 60% increase covering 600,000m² or more floor space each year from 2019-2030;
- 70,000 homes (and 10 million m² of commercial buildings) will be retrofitted to use clean electricity in space heating;
- 60% of homes (and 40% of commercial buildings) will be heated with clean electricity; and
- For heating water, 150,000 new residential heat pumps in place of natural gas appliances.¹⁷

Key residential retrofit program elements of the CleanBC program that are currently in the market include:

- Rebates for homeowners to lower the cost of heat pumps and windows. These are integrated with incentives for insulation and other energy-saving upgrades;
- Integration of all utility and government incentives under one umbrella;
- A single application for EfficiencyBC, BC Hydro, FortisBC, and local government incentives;
- Free energy coaching services for homes and businesses, including a phone and email hotline staffed by energy coaching specialists;
- A one-stop-shop website with an incentive search tool and useful information on options for energy efficiency upgrades; and
- Rebates and direct installations of energy efficiency improvements for lower-income households.¹⁸

Other CleanBC program components that will be in the market in the next three to five years include initiatives to significantly expand reach to more homes and the impact of retrofits:

- Improved building energy information available to buyers and sellers;
- Adoption of the Model National Building Code for existing buildings by 2024;
- Targeted low-interest financing, allowing people to make improvements and pay for them over time with savings from their energy bills¹⁹;
- Specialized support for rental housing;

¹⁶ cleanBC: our nature. our power. our future. (2018) p5

¹⁷ cleanBC: our nature. our power. our future. (2018) p16

¹⁸ cleanBC: our nature. our power. our future. (2018) p29

¹⁹ For financing programs to enable people to pay for funds loaned with their energy bills the overall costs of the systems would need to be reduced with rebates and multiple upgrades would need to be pursued so that home energy savings would be enough to pay for loans.

- Specialized support for Indigenous and non-Indigenous communities;²⁰
- Increased efficiency standards for heating equipment and cooling;
- Development of innovative and cost-effective low-carbon solutions;
- Making residential natural gas consumption cleaner by putting in place a requirement that at least 15% to come from renewable natural gas;
- Development of a Certified Retrofit Professional Accreditation.²¹

The government of British Columbia, as represented by the Ministry of Energy and Mines, along with BC Hydro and FortisBC, have set specific total retrofit and participation targets for residential retrofits through to 2021/2022. The Strategy is designed to help them meet these targets, while acknowledging that it will be necessary to go much further. For details about the targets that the Province and the utilities have set, please see Appendix II.

²⁰ cleanBC: our nature. our power. our future. (2018) p29

²¹ cleanBC: our nature. our power. our future. (2018) p65

Comox Valley Regional District Context: Climate Action

Comox Valley Guiding Vision for Taking Action against Climate Change: “The Comox Valley is a region of distinct, well-connected and well-designed urban and rural communities with a high quality of life, a vibrant, entrepreneurial local economy, and a healthy and sustainable bioregion. Local governments, agencies and residents work cooperatively and collaboratively as stewards to protect and enhance the region’s spectacular natural landscapes and marine areas. Development is integrated with the natural environment and decision-making is driven by the shared goals of conserving land, water and energy resources. Residents enjoy efficient and affordable services and infrastructure that support community health and well-being, the long-term prosperity of the region, and accommodate evolving demographics and economic opportunities. A range of urban and rural housing types, tenures and costs are provided to meet the needs of the region’s diverse population.”²²

Targets: “The *Comox Valley Sustainability Strategy* has adopted a long-term target of 80 percent reduction of GHG emissions from 2007 levels by 2050, with a mid-term target of 50 percent reduction by 2030. The RGS has adopted the same target as the *Comox Valley Sustainability Strategy*. It sets out policies, targets and measures that work to achieve the provincial target and the long-term targets of the Sustainability Strategy, with a specific 2030 reduction target of 50 percent from 2007 levels by 2030.”²³

Regional Growth Strategy Objective 8-A: Reduce GHG emissions created by the building sector. “BC’s Community Energy and Emissions Inventory divide the building sector into residential, commercial, and industrial buildings. ... GHG reductions in this area will require a multi-faceted approach to reduce energy consumption in new buildings and retrofit older buildings to make them more efficient.”²⁴

Sustainability Strategy Objective 2.1.4 - Existing homes and buildings are retrofitted for increased energy efficiency. Target: % of residential units built in 2008 or earlier that have undertaken an energy retrofit or replacement to achieve a rating of EnerGuide 73 or above, or a 25% reduction in energy use for a given floor area: 2020 - 30%; 2030 - 60%; 2040 - 85%; 2050 - 95%.²⁵

²² Comox Valley Sustainability Strategy. 2010. https://www.comoxvalleyrd.ca/sites/default/files/docs/Projects-Initiatives/1rs_cvsustainabilitystrategy_18feb2010.pdf

²³ Comox Valley Regional Growth Strategy Bylaw No, 120, 2010
https://www.comoxvalleyrd.ca/sites/default/files/uploads/bylaws/bylaw-120_comox_valley_regional_district_regional_growth_strategy.pdf

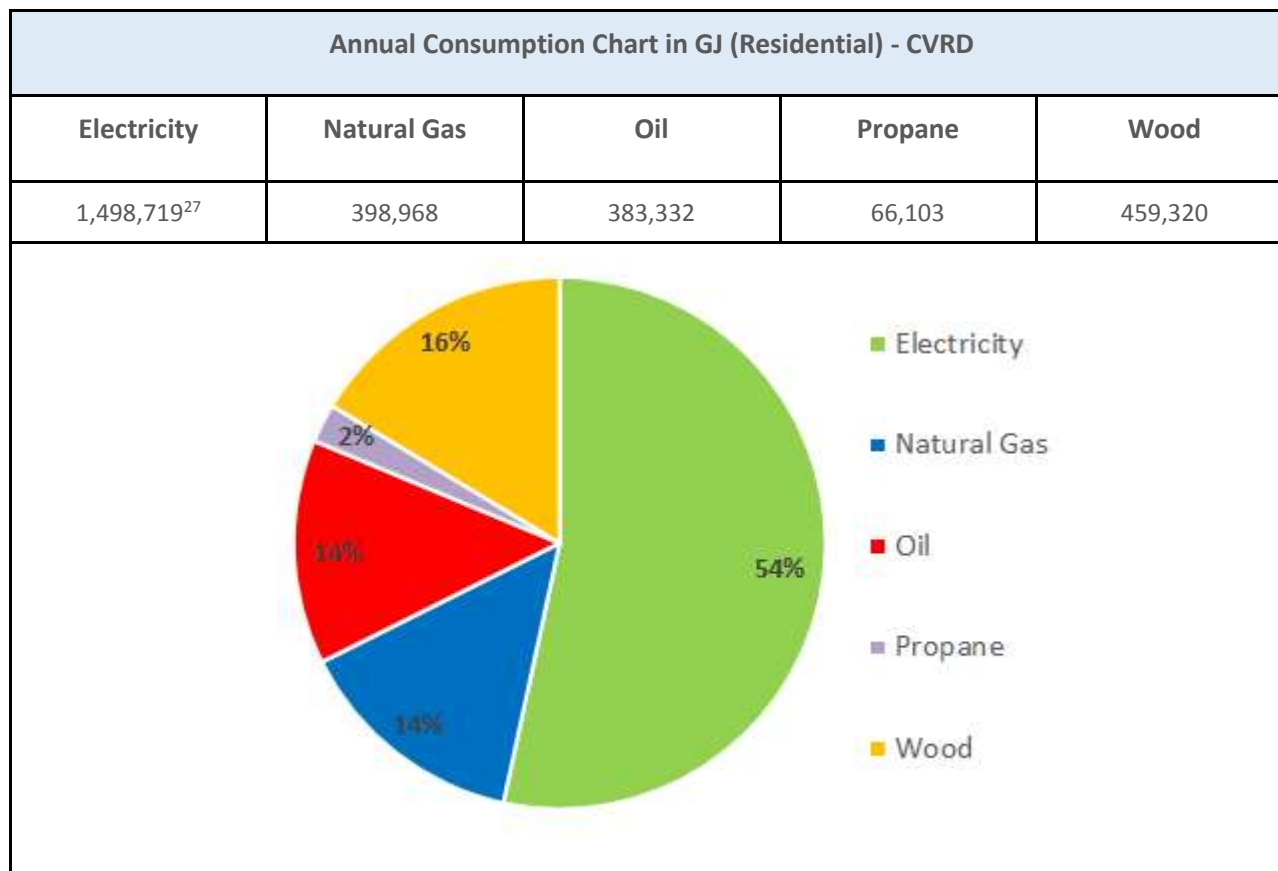
²⁴ Regional Growth Strategy, p71.

²⁵ Sustainability Strategy, p39.

Appendix II: Supporting Data

How GHG Emissions Inventory Data Informs Strategy

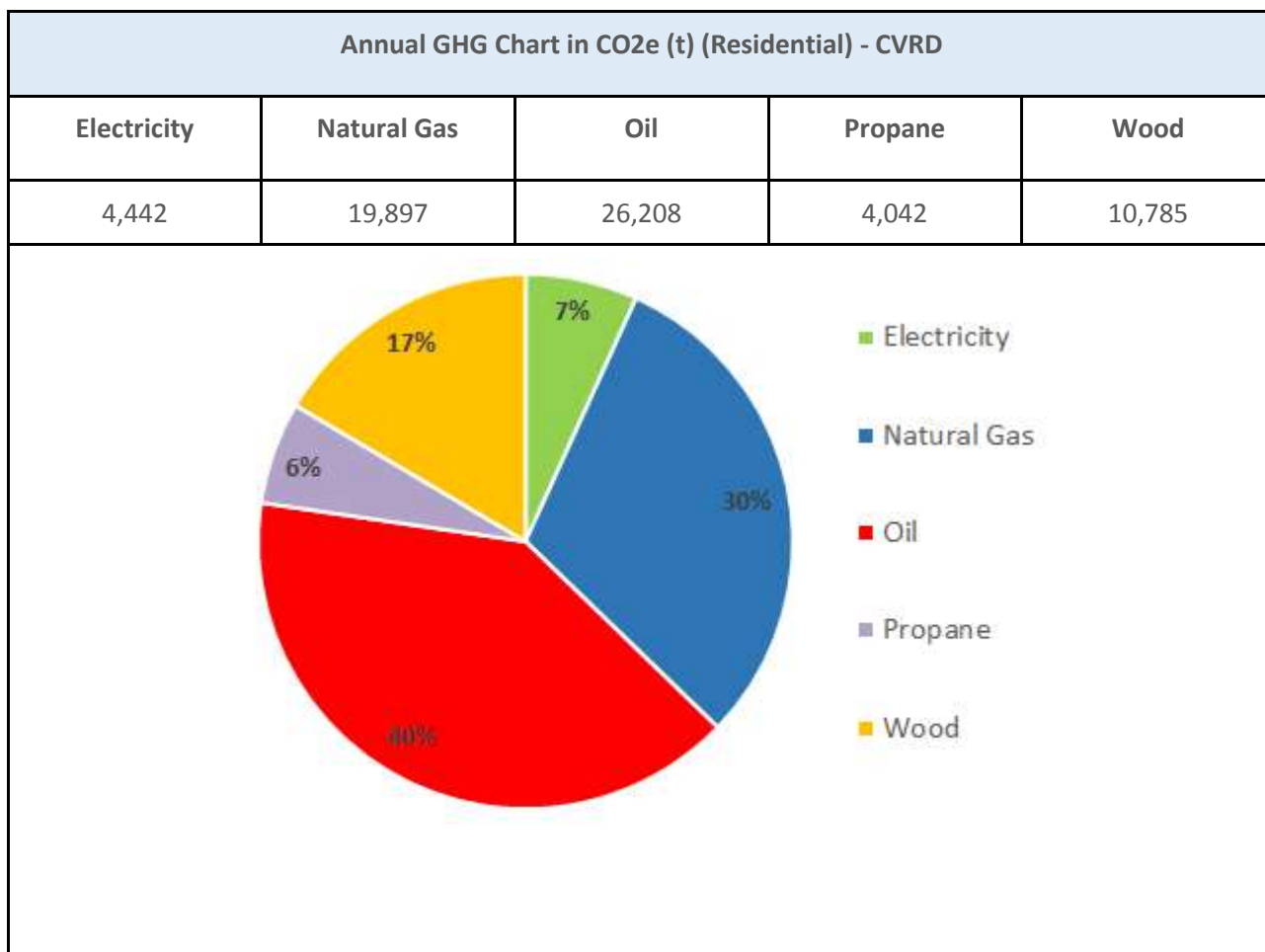
A key objective of the Strategy project is to reduce residential greenhouse gas emissions. The Emissions/Consumption data used in this report is taken from the Provincial Greenhouse Gas Emissions Inventory, specifically the document entitled “BC utilities energy data at the community level”.²⁶



²⁶ Provincial Greenhouse Gas Emissions Inventory (2017):

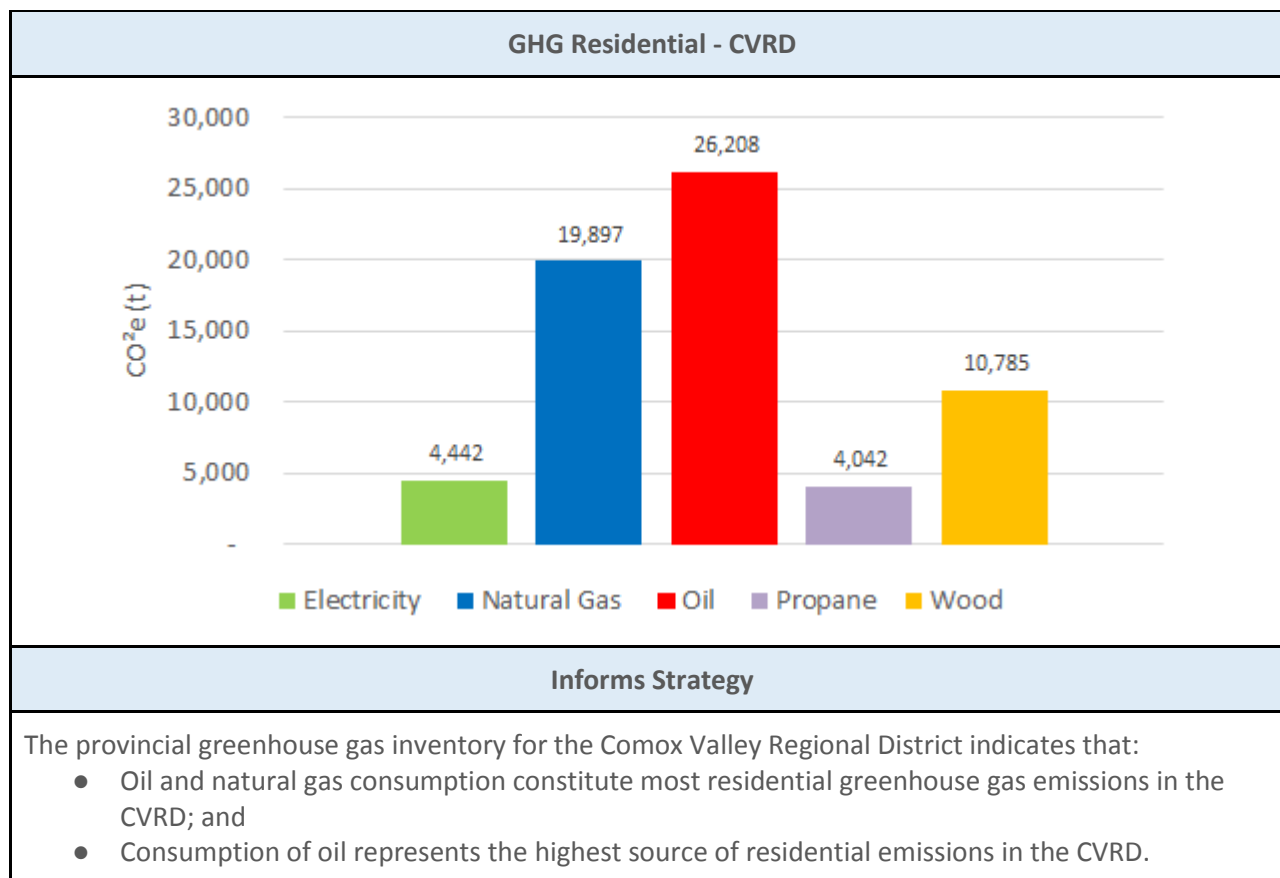
<https://www2.gov.bc.ca/gov/content/environment/climate-change/data/provincial-inventory>

²⁷ 416,311,000 kWh



Although this data is only provided for all residential buildings, rather than segmented by residential building types, the data clearly outlines that the largest source of emissions comes from the consumption of oil and natural gas. Residential buildings in the CVRD consume 398,968 GJ in natural gas and 383,332 GJ in oil annually. This translates to 46,105 CO₂e (t) annually.

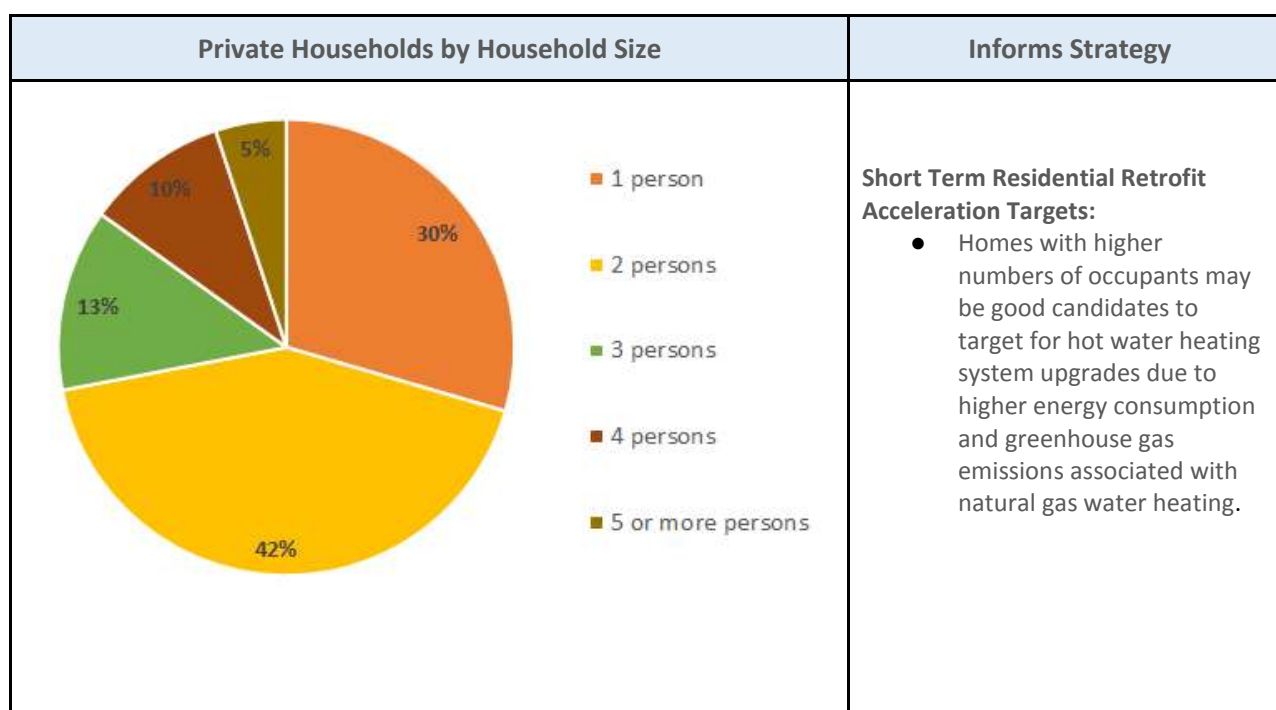
The following graph shows the GHG emissions by fuel type for the CVRD. This information is highly relevant when deciding which Municipalities and Electoral Areas to target for heat system upgrades.



How Regional and Community Building Stock Informs Strategy

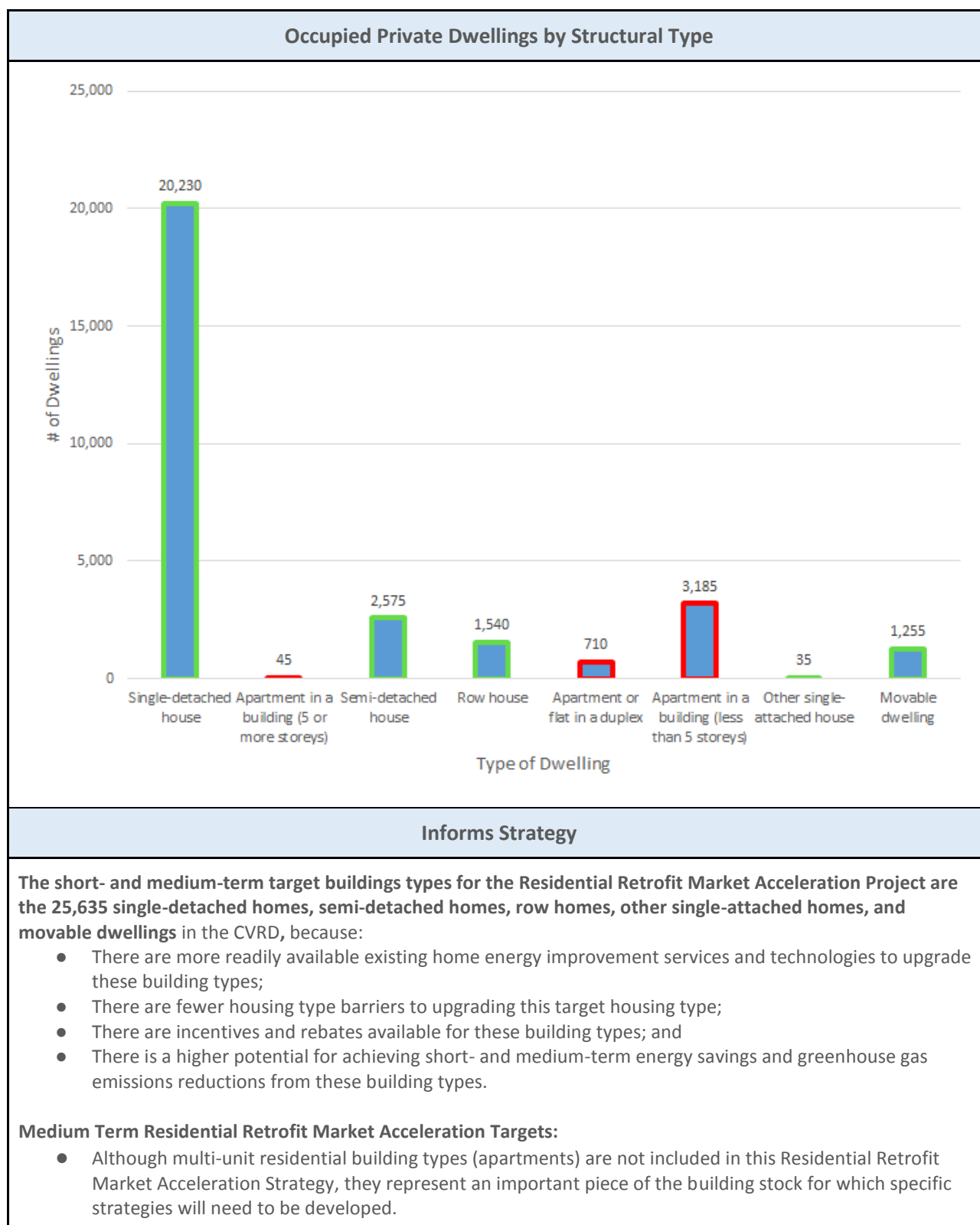
The Residential Retrofit Market Acceleration Strategies for each community or region are partially formed by an assessment of the building stock in that community or region, specifically Private Households by Household Size, Occupied Private Dwellings by Structural Type, and Private Dwellings by Tenure.

The best information currently available for building stock data is from the 2016 Census via Statistics Canada ('Housing and Building Characteristics').²⁸ We acknowledge that there are some limitations to this data and that more analysis of the target housing stock would be beneficial. That undertaking is outside of the scope of work for this project.



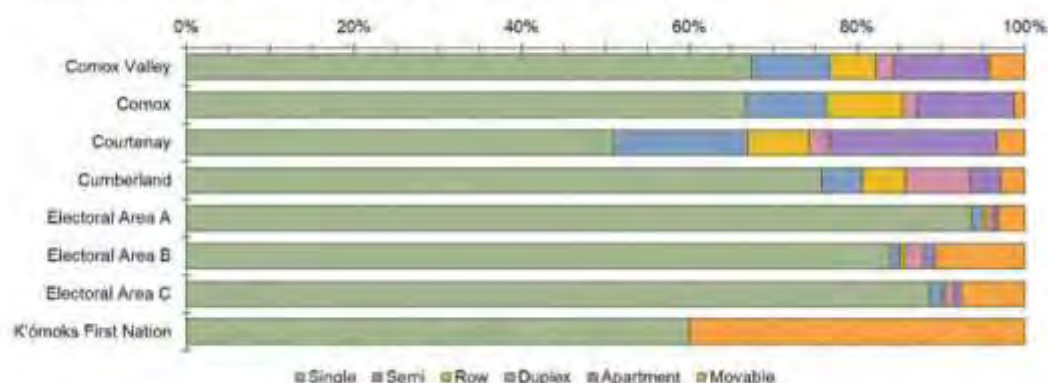
²⁸ Statistics Canada search tool: <https://www12.statcan.gc.ca/census-recensement/2016/dp-pd/prof/search-recherche/resultsresultats.cfm?Lang=E&TABID=1&G=1&Geo1=CD&Code1=5917&Geo2=&Code2=&type=0&SearchText=regional+district+of+nanaimo&SearchType=Begins&wb-srch-place=search>

Please note: the building stock data herein doesn't match exactly with the BC Building Code's definition of a Part 9 building (which according to the BC Building Code is a house or small building that is three stories or less and/or no more than 600 square meters). The 2016 Census data used to compile this report is indicative of the types of houses available for retrofit within the project parameters.



The CVRD Housing Needs Assessment breaks this dwelling type data down by municipality and electoral area. The following figure was taken from the Housing Needs Assessment:

Figure 22. All Communities – Proportions of Dwelling Types, 2016. Source: Statistics Canada.



This kind of area-specific data within the region demonstrates that different municipalities and electoral areas are experiencing different challenges related to housing, energy use, and dwelling types.

Private Households by Tenure	Informs Strategy
<p>■ Owner ■ Renter</p>	<p>Of the 29,575 private households in the CVRD, 77% are owned by their occupants, and 23% are home to renters.</p> <p>The immediate to short term target type of households by tenure are owner-occupied households, because:</p> <ul style="list-style-type: none"> • The financial incentives currently available are primarily focused on owner-occupied buildings. • Owners have a higher financial capacity to invest in home energy retrofits. • Owners are more frequently undertaking other amenity renovations into which home energy retrofits could be integrated. <p>The short to medium term targets are to work with stakeholders to develop programs for renters. For example:</p> <ul style="list-style-type: none"> • Work with stakeholders to support the development of new strategies to engage landlords and renters to retrofit homes that are

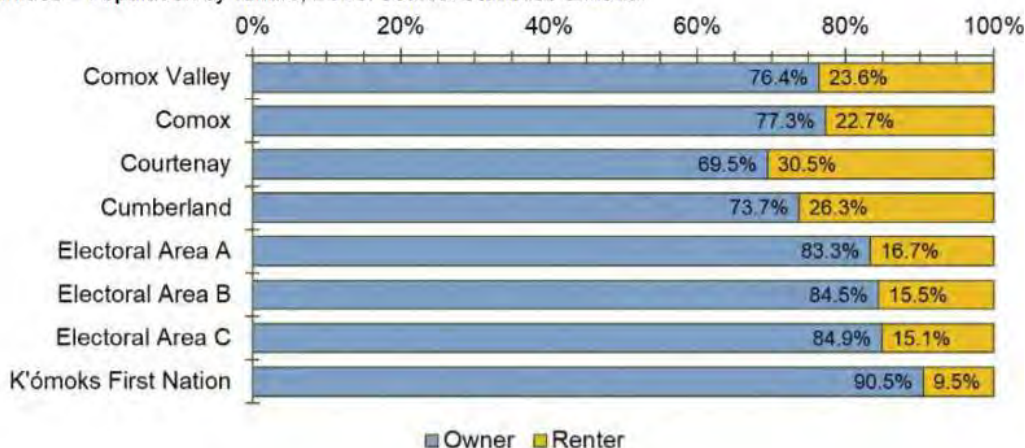
	not owner-occupied.
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Local Context: Demographics

Demographic information taken from the Housing Needs Assessment (HNA) demonstrates the need for solutions for aging homeowners, low income community members and young families, and renters. According to the HNA, "The Region's population of seniors (persons aged 65 years or older) grew 58.2 percent over 10 years. This increased their share of the total population from 18.1 to 25.2 percent. CVRD's median age was 50.3, up from 44.9 in 2006."²⁹ Seniors represent a growing demographic in the CVRD, with specific needs regarding housing, energy use, and financing. Meanwhile, the HNA found that "About 15 percent of Comox Valley residents fall below the after-tax Low-Income Measure (LIM)."³⁰

The Housing Needs Assessment also found that "Renters are 6 times more likely to experience Extreme Core Housing Need than owners in the Comox Valley. Extreme Need depicts what (sic) households pay more than 50 percent of their income on shelter costs."³¹

Figure 12. All Communities – Population by Tenure, 2016. Source: Statistics Canada.



The following statistics further demonstrate the necessity for finding solutions geared specifically towards renters in the Comox Valley Regional District:

- "The Comox Valley is growing – the population of CVRD is expected to grow to 70,875 by 2025, up 10.1 percent from 2016. Between 2006 and 2016 the number of owner

²⁹ Housing Needs Assessment, July 2020, p.26.

http://agendaminutes.comoxvalleyrd.ca/Agenda_minutes/CVRDBoard/BRD/14-Jul-20/d_Dyson%20SR%20Housing%20Needs%20Regional%20Final%20Report.pdf

Figure 12 is also taken from the Housing Needs Assessment.

³⁰ Housing Needs Assessment, p.38.

³¹ Housing Needs Assessment, p.11.

households grew 15 percent to 21,625 and the number of renter households grew 24.5 percent to 6,775.”

- “The numbers of renters are up across the Comox Valley 24.5% since 2006. This points to a greater need for dedicated rental housing options.”
- “Courtenay, the largest urban community, has the highest rate of renter households at 30.5 percent. This is followed by Cumberland and Comox at 26.3 and 22.7 percent. The electoral areas exhibit rates around 15.5 percent.”³²

How Industry Input and Capacity Inform Strategy

This Strategy document has been informed by five Residential Retrofit Acceleration Strategy Development workshops on Vancouver Island (three were held in the Capital Region, one in Nanaimo, and one in Courtney) and a series of industry interviews and consultations. In total, 150 residential retrofit industry stakeholders were consulted.

Findings from industry stakeholders include the following:

1. The retrofit industry needs to be engaged and informed about provincial, utility, and local government residential retrofit targets so that they are aware of and able to respond to potential market growth.
2. Significant workforce development and investments in supporting industry training will be required in the medium term to meet provincial targets.
3. There may be few contractors available to meet consumer demand for some residential retrofits in the region, for example for air source heat pump hot water heaters.
4. Even when there is capacity to meet consumer demand, homeowners may have no way to easily identify which contractors are selling the products they are looking for – the two most notable challenges in the Capital Region are finding contractors that sell CleanBC rebate eligible Tier 2 windows and air source heat pump hot water heaters.
5. There are a variety of moderate to significant industry-identified barriers to accelerating residential retrofits that need to be collectively addressed for regional retrofit targets and market growth of the residential retrofit industry to be realized. See “Market Accelerator: Barriers” for a prioritized list of barriers informed by industry input.
6. There is excellent potential to increase the number of existing contractors in the region that are providing home energy retrofit services and participating in the government and utility rebate programs. Engagement of general renovators has the potential to have this industry integrating home energy retrofits into general amenity renovations and potentially completing whole-home retrofits.

Local and regional governments can support the ongoing engagement of industry by collaborating to keep industry engaged and informed about policies, programs, and promotions to accelerate retrofits.

³² Housing Needs Assessment, p.33-34.

Residential Retrofit Contractors Operating in the Comox Valley: September 2019

Through the development of the Residential Retrofit Contractors Database, it has been identified that the Comox Valley has a healthy network of contractors who provide services related to home energy retrofits.

- This database does not yet include general renovators who actively provide home energy retrofit services. This research is ongoing.
- Not all contractors in this database are currently participating in rebate programs. All of them are being contacted and offered opportunities to learn about the rebates available.
- Vancouver Island has the most active heat pump industry in the province.

Industry Sector	Business Count
General HVAC	12
Heat Pumps	20
Gas furnace or boiler	11
Oil furnace or boiler	3
Electric furnace	3
Wood Heating	0
Gas Fireplace	3
Electric Fireplace	0
Hot Water Heater	6
Heat Pump Hot Water Heater	0
Draftproofing	0
Windows, Doors	18
Insulation	9
Renewables	1
Misc.	2
Total Unique³³ Businesses	48

³³ Due to some overlap between contractors for General HVAC, heat pumps, and gas furnaces, this list has the potential for a business total that is more than the actual number of existing businesses. To avoid this, the number of

Provincial and Utility Residential Retrofit Rebate Program Targets

The ability of local governments to meet residential retrofit and greenhouse gas reduction targets will be partially dependent upon residents being able to access financial rebates to reduce the cost of home energy improvements. The following charts outline the total individual residential retrofit rebate targets for the Ministry of Energy and Mines, FortisBC, and BC Hydro for the CleanBC and Home Renovation Rebate Program. These are the respective targets for uptake in retrofit rebate programs as of 2019. These targets only include retrofits of eligible products in eligible homes that apply for retrofit program rebates and do not include other retrofits that may be pursued by homeowners outside of rebate programs or retrofits of ineligible products or retrofits in retrofit program ineligible homes.

The Ministry of Energy and Mines

Total Retrofit Rebate Targets (as of 2019)			
Retrofit	2020	2021	2022
Heat Pump Water Heater	48	280	833
Windows in fossil-fuel heated homes	900	2,000	2,000
Space Heating Fuel-Switching (ASHP)	2,850	5,050	10,250
Total	5,818	9,351	15,105

BC Hydro

Retrofit Rebate Participation Targets (as of 2019)		
Retrofit	2020	2021
Water Heater - Air Source Heat Pump	35	37
Windows	300	315
Insulation	1,477	1,550
Air Source Heat Pump	1,602	1,682

total unique businesses has been provided, which is not equal to the sum of the numbers provided. Each business has been counted only once regardless of the number of services it provides.

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Total	3,414	3,584
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FortisBC

Annual Retrofit Rebate Participation Targets (as of 2019)					
Retrofit		2019	2020	2021	2022
Space Heating	Direct Vent Wall Furnace	180	200	220	240
	Boiler	500	500	500	500
	Combination System	500	540	610	650
	EnerChoice Fireplace	6,760	7,440	8,190	8,410
	Furnace	7,000	7,000	7,000	8,000
Building Envelope	Attic Insulation	2,250	2,475	2,720	3,000
	Wall Insulation	240	265	290	320
	Crawlspace and Basement Insulation	265	290	320	350
	Other Insulation	110	120	130	150
Water Heating	Condensing Storage Tank Water Heater	530	580	640	700
	Condensing Tankless Water Heater	1,700	1,870	2,060	2,260
	0.67 EF Storage Tank Water Heater	3,680	4,050	4,450	4,900
Water Conservation	Aerators & Showerheads	650	650	650	650
	ENERGY STAR Washer	2,250	2,500	2,750	3,025
	ENERGY STAR Dryer	100	100	100	100

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Other	Drain Water Heat Recovery	100	200	300	400
	Communicating Thermostat	2,800	5,600	5,600	6,400
	HVAC Zone Controls	0	100	560	640
	Appliance Maintenance	50,000	50,000	50,000	50,000

Appendix III: Dragons of Inaction

Understanding and addressing ‘The Dragons of Inaction’ that are preventing the widespread adoption of heat pumps and residential retrofits

Robert Gifford’s 2011 article in *American Psychologist* entitled ‘The Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation’³⁴ presents a relevant academic framework for identifying and addressing the barriers to widespread adoption of heat pumps and other residential retrofits.

Gifford identifies seven general psychological barriers:

- Limited cognition (lack of knowledge etc.);
- Ideological worldviews that tend to preclude pro-environmental attitudes and behaviour;
- Comparisons with key other people;
- Sunk costs and behavioral momentum;
- Discredence toward experts and authorities;
- Perceived risks of change; and
- Positive but inadequate behavior change.

A lack of knowledge associated with building retrofits is an acknowledged issue in the strategy. A number of the ‘dragons’ are potentially relevant in homeowners’ acceptance of heat pumps and/or deep energy retrofits, including:

- The sense that an individual’s actions are too inconsequential to influence the broad issue of climate change, or even that nothing can be done about the problem (limited cognition).
- Decisions about what actions are appropriate based on the actions of their neighbours (comparisons with key other people).
- Once someone has made an investment in something, like a working oil or natural gas furnace, of which it would be more rational to divest oneself given current conditions, it is common to hold onto it (sunk cost).
- Mistrust of government messaging and/or belief that the programs are inadequate and not worth their participation (discredence).
- Risk that there will be functional problems with the green technologies that one decides to adopt, that the savings promised will not materialize, or that climate-mitigating strategies could damage social reputation (perceived risk).

Gifford writes that enacting environmental change requires that citizens understand the planet as “a delicate, threatened, and interconnected system”³⁵ which is affected by our actions. Moreover, it is necessary that we feel our actions going forward will be able to make a difference. Gifford

³⁴ Gifford, Robert. “The Dragons of Inaction: Psychological Barriers that Limit Climate Change Mitigation and Adaptation.” *American Psychologist*, May-June 2011. pp290-302.

<https://web.uvic.ca/~esplab/sites/default/files/2011%20Climate%20Change%20in%20AP%20Dragons%20.pdf>

³⁵ Gifford, 297.

goes on to acknowledge that emotion plays a strong role in some of the barriers to environmental action, and not others. While structural barriers must be removed for change to occur, there will be lingering psychological barriers even after this has been achieved. The Dragons of Inaction represent these psychological barriers and are therefore one part of addressing impediments to uptake of residential retrofits.

To address the Dragons of Inaction in the context of home retrofits, the Residential Retrofit Acceleration Strategy recommends borrowing from Gifford's five essential strategies for overcoming the Dragons of Inaction barriers:

1. "Analyze specific barriers at the behavioral level. Define very specifically the behavior that is holding individuals back from more climate-friendly choices [...] then observe and record it, intervene, test the interventions' impact, and evaluate the program."³⁶
2. "Create better ways to feed information back to consumers and citizens."³⁷
3. "Improve understanding of bases for public support of, and opposition to, policies and technologies for limiting climate change."³⁸
4. "Design and conduct more interventions studies aimed at important carbon-related behavior choices."³⁹
5. "Work closely with other disciplines, with government agencies, and with technical experts."⁴⁰

Gifford suggests that "the dragons of inaction can be overcome, although the effort will take time and will never be complete. However, through a combination of appropriately targeted messages, effective leadership, improved technical knowledge, equitable policies, enabling infrastructure, the development of norms, the setting of reasonable goals, in-your-face feedback, the spreading of social norms through social networks, and appropriate personal rewards, it will be done."⁴¹

³⁶ Gifford, 298.

³⁷ Gifford, 298.

³⁸ Gifford, 298.

³⁹ Gifford, 298.

⁴⁰ Gifford, 298.

⁴¹ Gifford, 298.