KASLO OFFICIAL COMMUNITY PLAN
APPENDIX IV

December 2020

West Kootenay
100% Renewable Energy Plan

Creating a pathway for local communities to use 100% Renewable Energy for transportation, buildings, electricity and local infrastructure no later than 2050.

CASTLEGAR · Village of Kaslo · City of NELSON · CITY OF ROSSLAND · Silverton British Columbia · CENTRAL KOOTENAY

3.2: Village of Kaslo

Village of Kaslo

Kaslo Quick Facts	
Area & population (density)	3.01 km², 968 (321.9 persons per km²)
Average Age (portion of population 65 or over)	49.6 (29.9%)
Total Private Dwellings (permanently occupied)	555 (469)
Median Household Income	$44,096
Utility infrastructure	Fortis BC Electrical, Municipal Sewer, BC Transit
Mean solar insolation per day**	5.92 kwh/m2
Heating Degree Days 2018 (2050 projection)	3,571(3,039)
Cooling Degree Days 2018 (2050 projection)	122 (243)
Walk/bike score	28/29

* Statistics Canada 2016 Census Data
**Natural Resources Canada, Photovoltaic Potential and Insolation Dataset

Kaslo is a community that is steeped in history, being the oldest incorporated community in the Kootenays. It is home to 1,000 residents and serves another 2,000 or so in the surrounding Area D. The recently restored City Hall is once again the seat of local government after extensive renovations were completed in 2019. Kaslovians can be justly proud that this green building features geothermal heat pumps and LED illumination. The community is also home to the SS Moyie Sternwheeler National Historic Site, and the Langham Cultural Centre, which represent important times in our history. The addition of Legacy Park beside City Hall and the recently announced Front Street Park, the extensive trail system and Kootenay Lake provide outdoor recreational opportunities for all ages. The Kaslo River once provided local hydroelectric power until the mid 20th century.

Kaslo is the West Kootenay's most remote municipality, yet it is one of the most advanced in rural broadband internet capability. Thanks to this, Kaslo is starting to attract telecommuters who are swapping their office desks for a mountain lifestyle. Innovation and creativity abound through the flexibility of virtual meetings and events like the annual Kaslo Jazz Festival, which also shifted to an online format in 2020 and thereby slashed its carbon footprint. Kaslo also has three charging stations, which is a great way to encourage EV ownership. However, residents and businesses are concerned about the reliability of the electric grid that is increasingly susceptible to long

outages due to climate change related impacts, which hinders economic investment and the uptake of solutions like EVs.

Although in-person consultation was not possible due to the COVID-19 pandemic, 33 Kaslo residents participated in an online survey about their community values, opportunities and barriers to 100% renewable energy. In general, Kaslo residents value their quiet community surrounded by a beautiful wilderness. They are concerned about the local economy, food security, and population growth, and the potential devastation caused by wildfire. To promote community resilience, residents supported local micro-hydro and solar projects. See Appendix IV for a complete summary of responses.

Where are we today?

The following summarizes the Village of Kaslo's current greenhouse gas emission inventory (2018 calendar year). This includes emissions for the municipal area as a whole (also referred to as "community emissions", which is inclusive of emissions associated with operations by the Village of Kaslo, "corporate emissions"). Total greenhouse gas emissions for the community for 2018 are 7,700 tonnes of CO2 equivalent (7.6 tonnes per capita). As Figure 1 shows, the majority of greenhouse gas (GHG) emissions in the Village of Kaslo come from mobility fuels

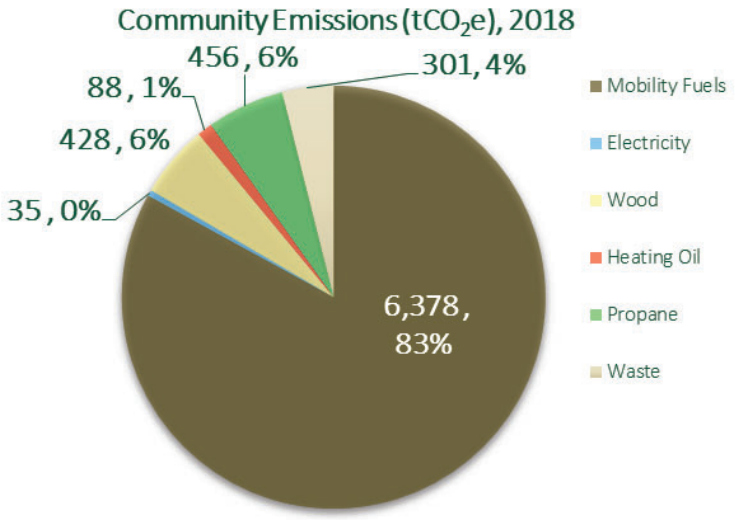


Figure 1 *2018 Emissions Summary for Village of Kaslo by Source*

The distribution of energy consumption, emissions, and estimated energy expenditures or each sector is shown in Figure 2.

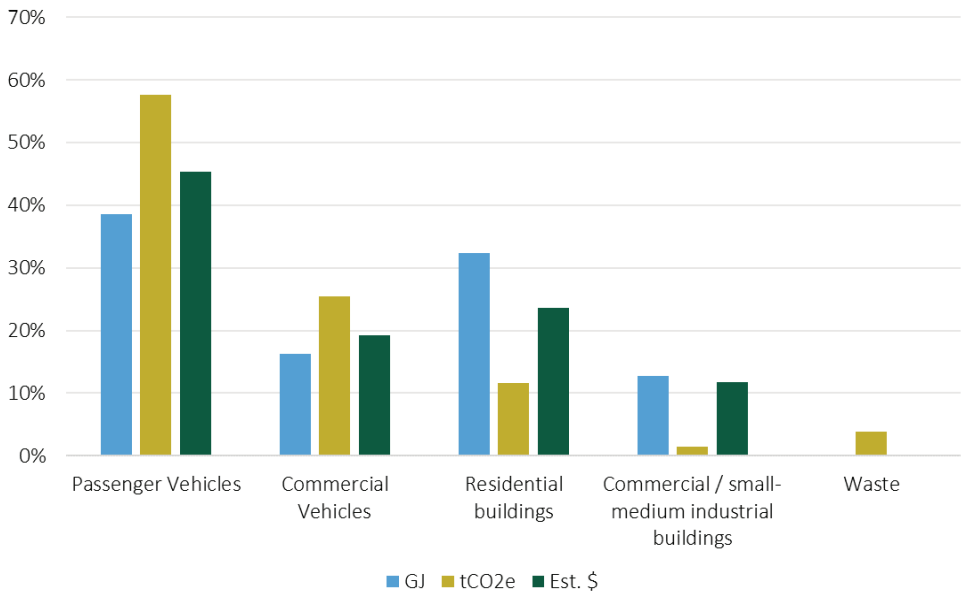


Figure 2 *2018 Energy, Emissions, and Expenditures split by sector for Village of Kaslo*

Passenger vehicles represent the largest source of emissions, energy, and cost at 58%, 39%, and 45% respectively. Commercial vehicles are the second largest source of emissions at 25%, while residential buildings are the second largest source of energy consumption at 32%, and energy costs at 24%. Of note though, residential buildings only contribute 12% of Kaslo's overall emissions. This is due to the lack of natural gas heating. Wood and propane contribute the majority of residential building emissions. Commercial buildings contribute 13% of energy and 12% of costs, but only 2% of emissions, owing to 93% of energy consumption as electricity.

Figure 3 shows the 2007-2018 emission inventories and the changes in emissions over that timeframe, as well as projected emissions in a business as usual scenario out to 2050. Emissions from passenger vehicles dropped slightly from 2007 to 2018 (4,600 to 4,400 tCO_2e). Emissions from commercial vehicles increased slightly during the same period (1,880 to 1,950 tCO_2e). Note that waste emissions spiked in 2014 to 1,180 tCO_2e, before dropping rapidly in 2015 to approximately 280 tCO_2e, and varying only slightly thereafter to 2018, despite waste tonnage

staying consistent at approximately 500 t from 2012 on. This is due to Kaslo's waste being redirected from the Central Landfill to Ootischenia in 2015, and the method in which the Province calculates, which is tied to the landfill where the waste is disposed.

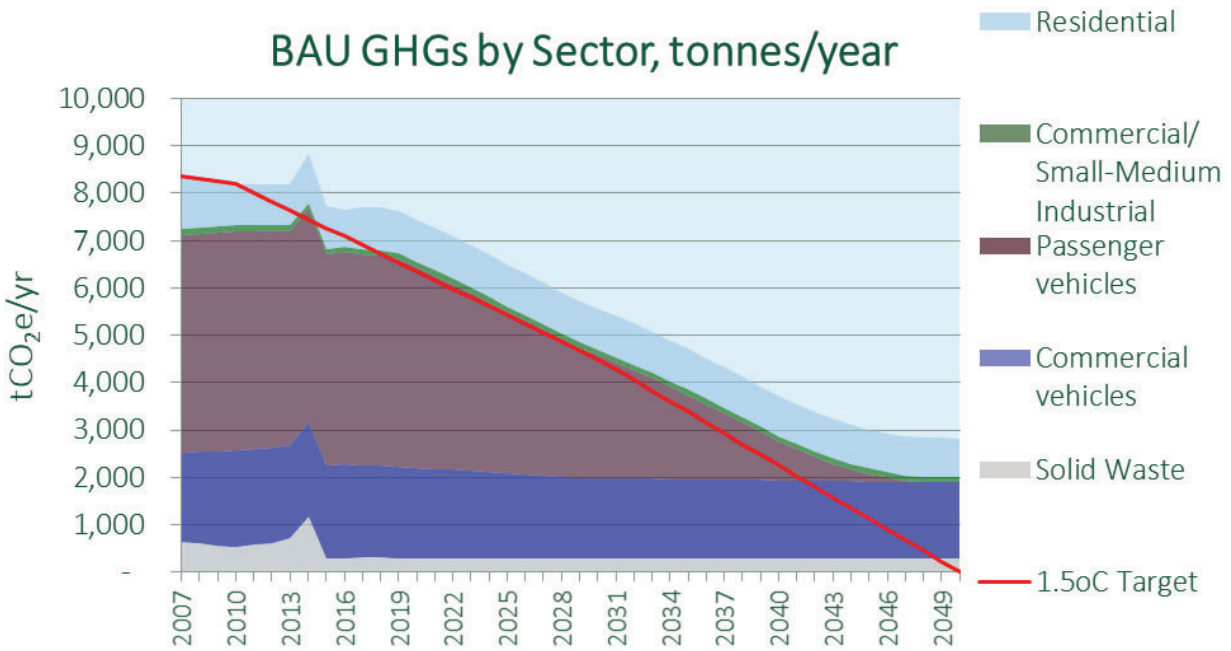


Figure 3 *2007-2018 Emission Summary by Sector and Business as Usual Projection*

Getting to 2030 & 2050 – Impacts from the Big Moves

In order to align with goals congruent with the Intergovernmental Panel on Climate Change 1.5°C report, the Village of Kaslo must reduce its GHG emissions from 5,600 tonnes CO2e (2030 business as usual projection) to 4,500 tonnes CO2e (2030 goal). This equates to a total of 1,100 tonnes CO2e emissions reductions, or about 19%. The reason for the relatively small decrease in emissions is because the baseline year for the 1.5°C goal is 2010, where emissions were 8,200 tCO_2e. For 2050, the Kaslo must reduce its GHG emissions from 2,800 tonnes CO2e to 0.

Kaslo's selected ambition levels for policy, infrastructure, and outreach actions for each of the big moves determined the parameters for projecting Kaslo's long-term emissions.

Kaslo's Selected Ambition Levels

Big Move	Electrify Passenger Vehicles	Shift Beyond the Car	Commercial Vehicles	Better Existing Buildings	New Buildings	Organics and Landfill Gas
Selected Ambition Level	Full	Mid-1	Minimal	Full	Mid-1	Full

Kaslo's Actions

Click here to see a spreadsheet of Kaslo's actions toward renewable energy.

Overall, the sample actions included in Part 2 are intended to be examples of actions that communities could pursue – not all actions are appropriate for all communities. In addition, the tables in Part 2 use somewhat simpler language than the full list of actions, which use more technical planning terms. The intent in Part 2 is to give the casual reader an idea of what some actions could look like; the intent in Part 3 is to list the appropriate actions for each community.

Figure 5 shows the estimated impact that each Big Move / action will have in 2030, and clearly shows that the top four Strategies by impact will be:

- Electrifying Passenger Vehicles
- Better Existing Buildings
- Shift Beyond the Car
- Organics & LFG

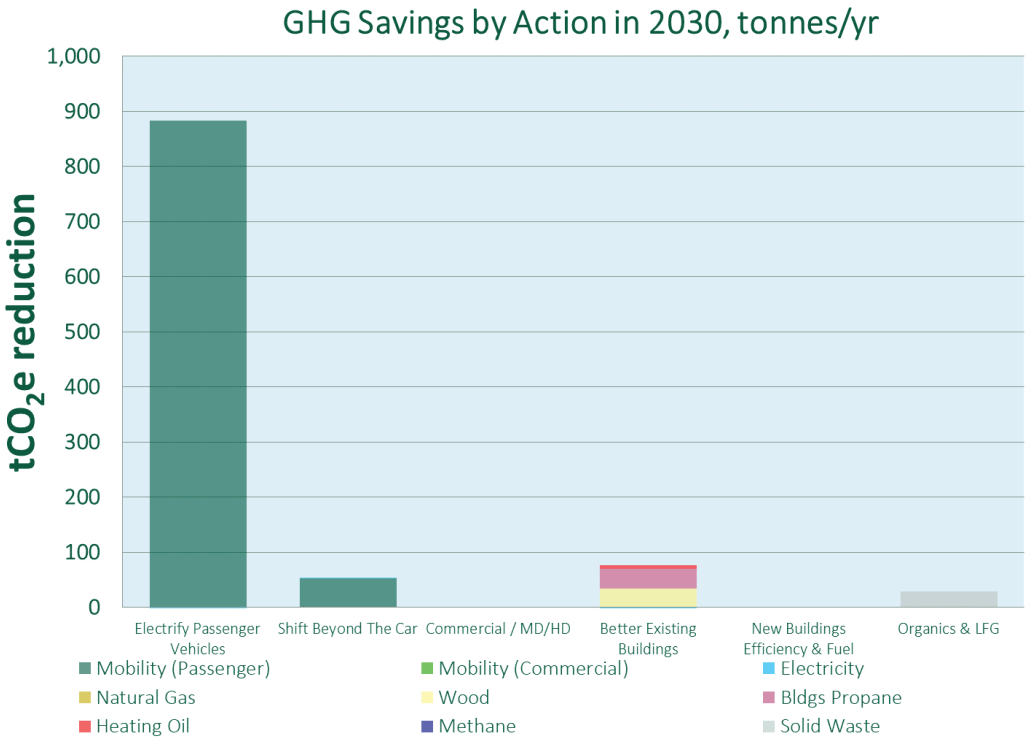


Figure 5 *Emission Reductions from the Big Moves in 2030*

In practical terms, the following shifts can be achieved by 2030:

- *Electrify Passenger Vehicles:* 220 conventional vehicles replaced with EVs
- *Shift Beyond the Car:* 20% of commutes eliminated through remote working policies
- *Better Existing Buildings:* 180 buildings (30%) undergoing energy retrofits to reduce energy use by 33%
- *Organics & LFG:* 22 kg/person of organics diverted per year, equivalent to about twenty 4 L milk containers

Overall, the Big Moves in conjunction with existing provincial and federal emission reduction policies will reduce GHG emissions by 1,000 tonnes CO2e in 2030 vs. business as usual, accounting for an overall reduction of 18% vs. 2010 levels, which puts Kaslo on track to meet its 2030 IPCC goal.

With the Big Moves in place, projections can be made as to their impacts on Kaslo's overall GHG profile to 2050. Emission reduction impacts to 2050 from each Big Move are shown in Figure 6.

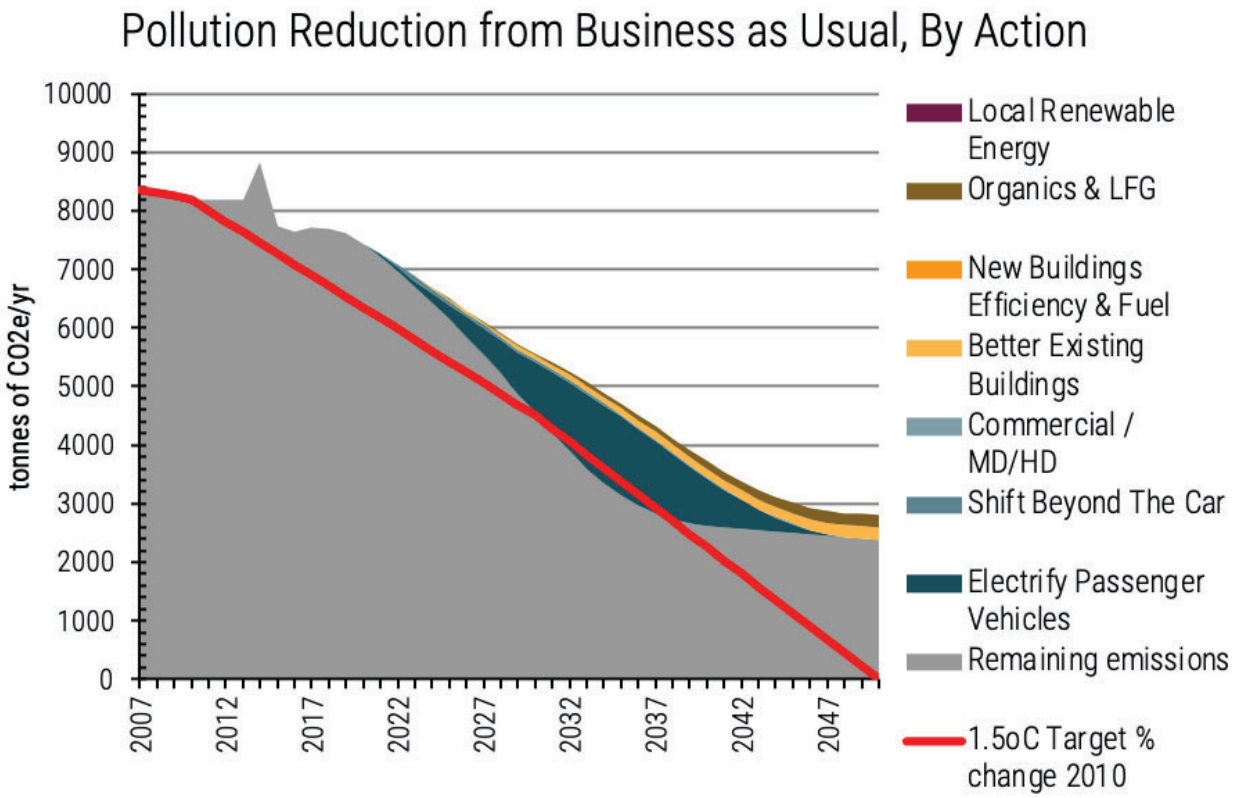


Figure 6 *Wedge Chart of Emission Reductions for Each Big Move to 2050*

At full implementation of all Big Moves, Kaslo is able to achieve a reduction of 440 tonnes CO_2e, equivalent to 15% of its 2050 emissions, with Organics and LFG (Landfill Gas Capture) and Better Existing Buildings contributing all reductions at 220 tonnes CO_2e. Note that for Electrify Passenger Vehicles, the reduction in 2050 is reduced considerably relative to 2030 and 2040, as the 100% of new vehicles as electric requirement in 2040 comes into effect, allowing for the business-as-usual case to "catch up". This is the main reason why the net reductions in 2050 vs.

BAU are smaller than in 2030. Note that for Organics & LFG, emission reductions in 2030 were smaller than for 2050. This is due to the assumption of a 10 year lag before landfill gas capture technology can be incorporated in 2030, eventually ramping up to capture 80% of landfill gas emissions by 2050.

Next Steps - Addressing Remaining Gaps

Though the implementation of the Big Moves will have a moderate impact on GHG reductions for the Village of Kaslo, there are some major gaps remaining, identified through the projection of residual emissions to 2050 below in Figure 7 by sector, and Figure 8 by source.

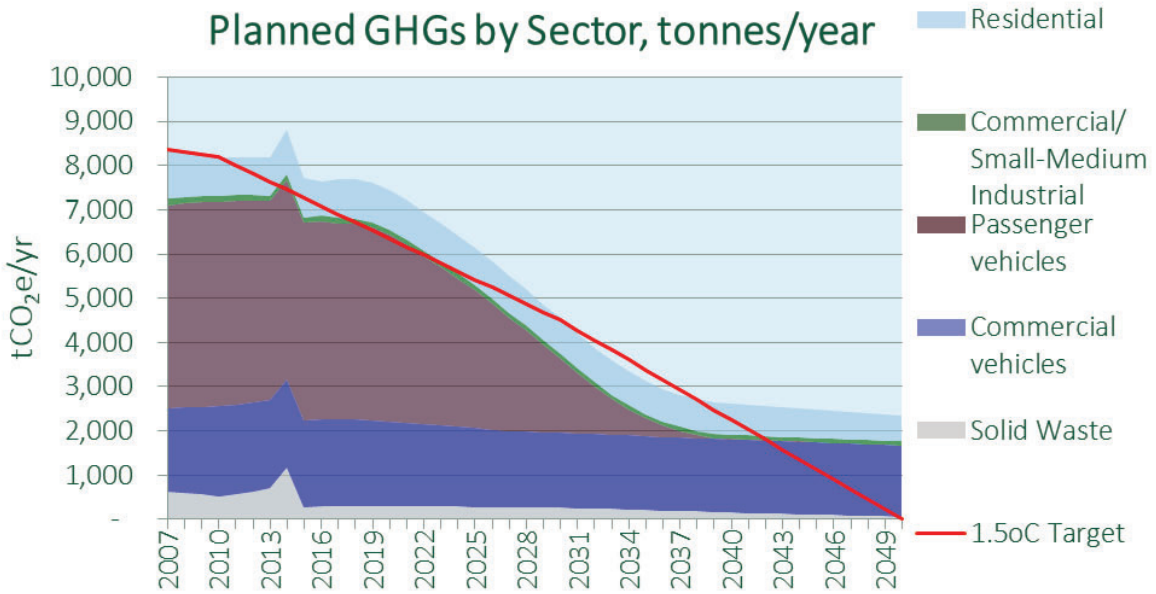


Figure 7 *Remaining Emissions to 2050 by Sector if Big Moves are Adopted*

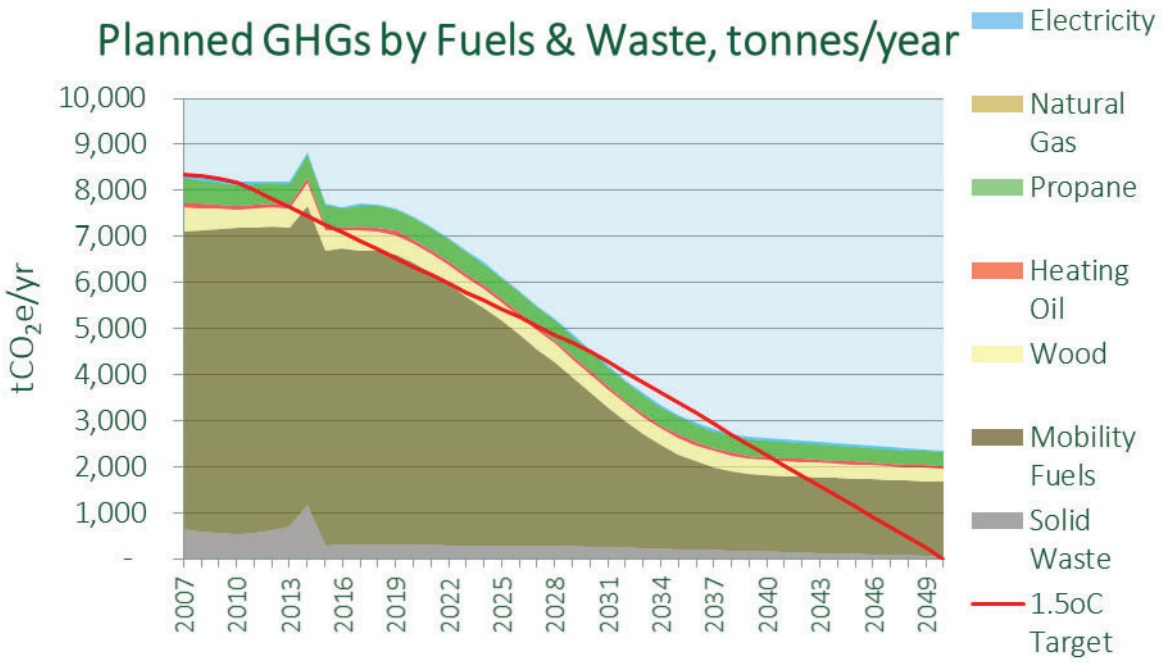


Figure 8 *Remaining Emissions to 2050 by Source if Big Moves are Adopted*

In summarizing Figure 7 and Figure 8, two gaps are evident:

- Commercial vehicle emissions
- Non-electricity heating (propane and oil) in existing buildings

These gaps are in line with the lack of direct policy levers that individual municipalities have for these areas, and reflect a conservative approach based on the lack of proven technologies in these areas. As discussed in Part 2, however, electrification of commercial vehicles is on the horizon, potentially reducing commercial vehicle emissions. A provincial retrofit code could reduce the building emissions. Propane and heating oil heating are both expensive compared to natural gas, and are emission heavy, making them prime candidates for replacement with low-carbon heating such as heat pumps (air or ground source). Participation in regional energy efficiency retrofit programs could accelerate retrofit deployment, and advocacy to the Province of BC to adopt a retrofit code and phase in commercial vehicles can also accelerate these important changes.

Kaslo Public Survey Results

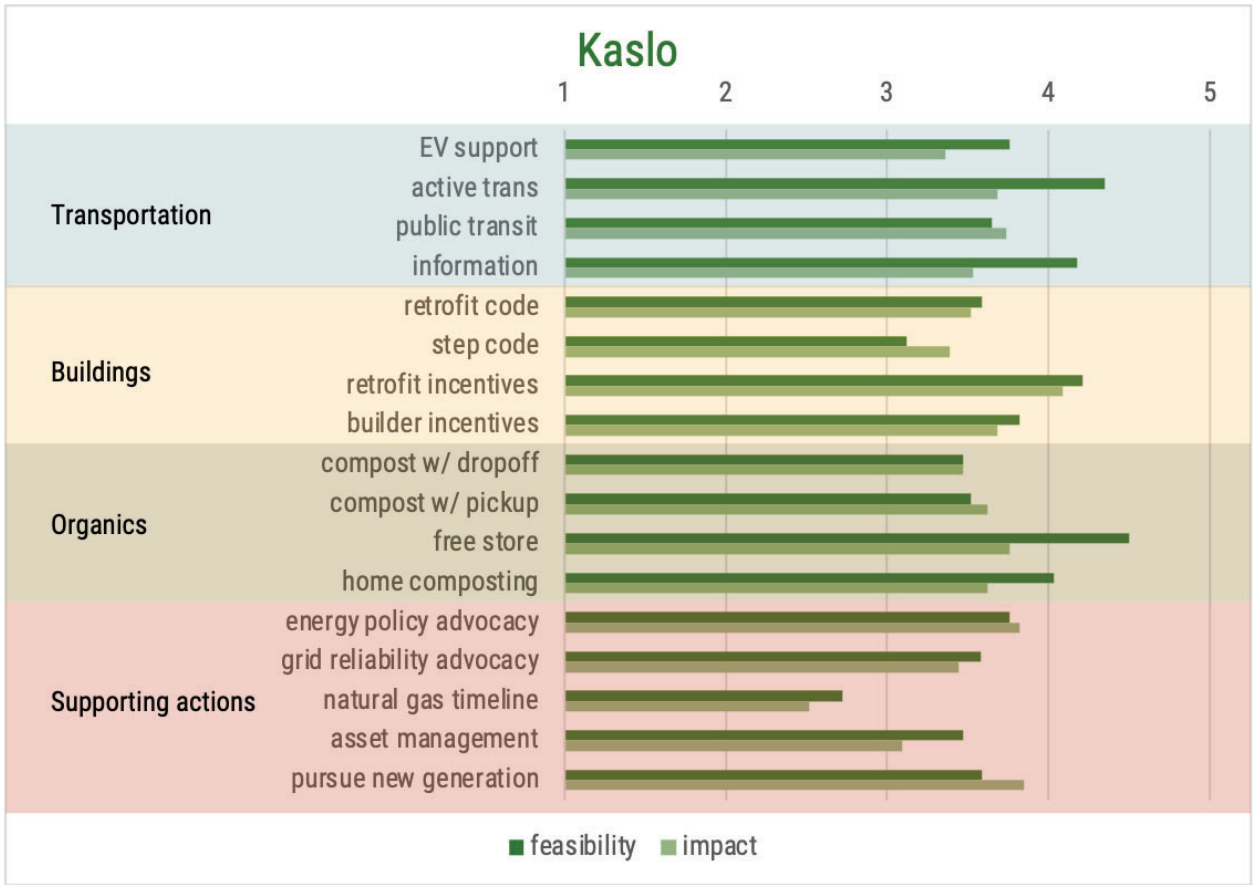
Kaslo residents were asked to complete a survey rating the potential impact and feasibility of potential actions. Based on 40 responses, the weighted average of the actions are shown in the chart below. All of the actions received average feasibility and impact ratings greater than the midpoint. Potential scores range from 1 to 5. The distinctions among many of the actions fall within the margin of error (+/- .6).

The highest impact ratings were for pursuing new generation (3.85), retrofit incentives (4.09), and energy policy advocacy (3.82), while the lowest rating was for advocating for renewable natural gas (2.52).

The highest feasibility ratings were for retrofit incentives (4.21), free store (4.5), and active transportation (4.35). The lowest feasibility ratings were for advocating for renewable natural gas (2.72), and adopting the step code (3.12).

Kaslo Proposed Actions	feasibility	impact
Promoting electric vehicles with charging stations & incentives	3.76	3.36
Adding more trails, paths and routes for walking, cycling etc	4.35	3.68
Adding more transit routes, stops, and rides	3.65	3.74
Providing more information about alternatives to car trips	4.18	3.53
Adopting a voluntary energy efficiency standard for building renovations	3.59	3.52
Adopting a higher energy efficiency standard for new buildings (the Clean BC Step Code)	3.12	3.39
Providing incentives and support for home energy efficiency retrofits	4.21	4.09
Providing incentives for builders to meet higher efficiency standards	3.82	3.68
Centralized compost facilities with drop off locations	3.47	3.47
Centralized compost facilities with curbside pickup	3.52	3.62
Designated locations for exchange of unwanted goods (eg "free store," Trash to Treasures)	4.5	3.76
Education and materials for home composting (eg free classes, subsidized containers and bear fences)	4.03	3.62
Ask the province to make it easier to generate community-scale renewable electricity in our region	3.76	3.82
Advocate for a more reliable electrical grid	3.58	3.44

Ask the province to set a timeline to move to 100% renewable gas	2.72	2.52
When improving or repairing community-owned infrastructure, include components that support renewable energy even if it increases cost	3.47	3.09
Build or invest in renewable energy facilities (eg solar farms, heating plants, etc)	3.59	3.85



Kaslo-Specific Inventory & Model Assumptions

The following assumptions were made, specific to the inventory and action modelling for the Village of Kaslo. For a list of general inventory and model methodology and assumptions, please consult Appendix X.

Inventory Assumptions

- 65% have secondary wood heating, 14% of homes use propane for their primary heating source, and 3% use heating oil for their primary heating source, as per drive-by heating survey results

Modelling Assumptions

- Based on ClimateData.ca RCP 4.5 median values, the 30 year average of Heating Degree Days around 2018 are 3,571, and in 2050 they will be 3,039
- Based on ClimateData.ca RCP 4.5 median values, the 30 year average of Cooling Degree Days around 2018 are 122, and in 2050 they will be 243
- Shift Beyond the Car impacts reduced to 2% due to remote nature of community. Reductions are based on 20% of commuters working one day a week from home, and assuming that commuting accounts for 50% of all vehicle kilometers travelled (VKTs). This reduction would commence in 2022 with a 1% reduction (10% commuters), followed by 2% in 2023 (20% commuters)
- New Buildings Efficiency & Fuel will be following the approach set out by the Regional District of Central Kootenay (RDCK). Based on ambition level of "Mid 1" for RDCK, reductions are expected to be within the margin of error, and therefore negligible.