



Residential Heating Oil, Propane, and Wood Heat Estimates for BC Communities

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1. Introduction

The Province of BC is developing a Community Energy & Emissions Inventory (CEEI) which will provide energy and greenhouse gas (GHG) inventories to BC municipalities and regional districts. A number of CEEI reports were produced as a pilot in 2008, using 2005 data. In 2009 reports were produced for the majority of BC local governments, using 2007 data. These reports included electricity and natural gas consumption for buildings, gasoline, diesel, and propane consumption for on-road transportation, and emissions from solid waste and deforestation. These 2007 reports were considered draft, as there were several concerns that needed to be dealt with. Final 2007 reports are expected to be produced in February 2010.

Among the concerns raised by recipients of the pilot and draft reports was that no heating oil or propane was included in the buildings sector. While insignificant in many areas of the province, there are still a large number of communities which do not have natural gas service and rely heavily on oil and propane for heating. Other areas, notably Vancouver Island, have only received natural gas service relatively recently, and many homes are still using oil and propane.

Oil and propane were not included in the reports due to the perceived difficulty of obtaining data. Unlike electricity and natural gas, which are supplied by a small number of major utilities, oil and propane are delivered by a large number of regional suppliers. These suppliers tend not to have easily accessible data or to have data broken down by municipality, or separated into commercial and residential. Some suppliers also may not be willing to provide data due to concerns about competition.

In the fall of 2008 a memo was prepared by the Pembina Institute, with input from Enerciency Consulting, that outlined the available data sources and possible approaches that could be taken to developing oil and propane estimates for CEEI. The memo noted that while obtaining data directly from suppliers would be difficult, there were several other data sources available from which estimates of oil and propane consumption could be calculated. However, most of the data is available on a larger regional basis, or there are concerns about its accuracy at a local level.

This intent of this study is to build upon the information in the Pembina memo. Further investigation of the data sources was undertaken, and estimates of consumption were calculated for each local government. In addition to heating oil and propane, estimates of wood consumption have also been included.

2. Data Sources

The Pembina memo identified nine potential sources of data that could be useful in establishing estimates of heating oil and propane consumption:

1. 2007 CEEI Reports (issued April 2009)

These provide the consumption and number of accounts for electricity and natural gas, at a local government level (municipality and regional district). The CEEI reports

are the best source of energy data available at the local government level. However, as these are still draft reports, there are some errors and omissions, including:

- Inaccuracy of aligning postal codes with municipal boundaries.
- Wholesale electricity sales in some municipalities served by Fortis BC.
- Terasen large multi-family accounts are listed under commercial.
- Some errors and missing data.

Prior to using the CEEI data, adjustments were made to partially correct for postal code alignment problems. Wholesale electricity was assigned to residential and commercial sectors based on typical ratios elsewhere in the region. Missing data and errors were corrected.

2. NRCan Home Energy Audit (Energuide) Database

This database contains information on all houses audited under the Energuide program. It contains over 40,000 records covering most of the province. However, it is not a statistical sample, as it only contains records for homeowners who choose (and pay for) an Energuide audit. Homes tend to be older than average, and there is a bias towards fuel heated homes, as opposed to electrically heated homes.

The Pembina memo indicated that, in spite of its bias, the Energuide database might be useful for checking local fuel breakdowns and consumption. However, it was found to vary too significantly from other data sources to be useful, and was not used in this study.

3. 2006 Census Community Profiles

The census community profiles provide valuable data such as population, number of dwellings, and dwelling type. Census data is generally quite accurate, as it surveys a very high number of subjects. Census data was used extensively in this study.

4. NRCan Energy Use Database

The Residential Energy Use Database provides estimated energy consumption breakdowns for typical housing types in BC. It is similar in detail to the BC Hydro CPR (see below), but does not have regional breakdowns. Therefore it was not used.

5. MEMPR Residential Baseline Study

This study also provides estimated energy consumption breakdowns for typical housing types in BC. It is similar in detail to the BC Hydro CPR, but the data is older and less accessible. Therefore it was not used.

6. BC Hydro Conservation Potential Review (CPR)

The CPR provides estimated energy consumption breakdowns for typical housing types in BC. This is an in-depth analysis and is considered fairly accurate, particularly on the electricity side, as it is aligned with provincial totals. Regional

breakdowns (Lower Mainland, Vancouver Island, Southern Interior, and Northern) are provided. This data provided the basis for dwelling energy consumption estimates.

7. NRCan Survey of Household Energy Use

This national survey was performed in 2003. Although some information is available on a provincial basis, most of it is withheld due to accuracy limitations. Therefore it was not used.

8. BC Hydro Residential End Use Survey (REUS)

This survey was done in 2006, and contains data on household fuel types. The sample size is large and considered fairly accurate. However, oil and propane use is relatively small, so it is somewhat limited by roundoff errors. The survey is broken down by the same region as the CPR (LM,VI,SI,N). This data was used for checking and adjustment of results.

9. BC Tax Data

The BC Government collects taxes and levies on various fuels, from which it was hoped that consumption information could be drawn. After several discussions with Ministry of Finance staff, it was clear that little useful information was available. Approximate revenues from the ICE fund levy were made available by fuel type. However, these combine residential and commercial use, and do not include propane (which is not charged the ICE levy). This data was only used to provide a very broad estimate of provincial consumption.

In addition to these sources, the following additional data sources were identified during the course of the study:

- Statistics Canada Report on Energy Supply and Demand In Canada 2007

This report provides estimates of heating oil and propane consumption in BC, both residential and commercial. Data is for the province as a whole, with no regional breakdowns. It was initially thought that this would provide the best provincial total to compare to calculated results. However it became apparent that the figures were significantly underestimating residential consumption. The data is collected by survey of major suppliers, none of which are major residential oil and propane suppliers in BC. Therefore this information was not used.

- BC Stats 2007 Population Estimates

BC Stats provides annual municipal and regional district population estimates. This data was used to estimate 2007 figures from 2006 census data in the Community Profiles.

- Terasen Residential End Use Survey

This survey, completed in 2003, is very similar to the BC Hydro REUS, but covers Terasen service territory. As it is older and the regional breakdowns don't align with the CPR, the BC Hydro REUS was used instead.

- Residential Wood Burning Emissions in BC (RWBEBEC)

This study was published by the Province in 2005. It contains estimates of quantities of wood used as residential heating fuel for 21 regions of the province. The data is based on surveys of over 3000 homeowners. This data was used to establish wood consumption figures for larger regions of the province.

- Consumption Data From Local Inventories

Estimates have been made for oil, propane, and wood consumption in some local government inventories. Some of these were from information provided by local suppliers, while others were calculated estimates. This data was used to check and adjust the calculated consumption figures. Information was available from the following jurisdictions:

- Capital Regional District (estimated)
- Metro Vancouver (estimated)
- Sunshine Coast Regional District
- Peace River Regional District
- District of Invermere
- Bowen Island Municipality

3. Methodology

3.1 Calculations

The approach taken to calculating oil, propane, and wood consumption and emissions was to estimate the total energy required for heating and other uses, and then subtract the electricity and gas consumption, which was known from the CEEI reports. The remainder could then be attributed to oil, propane, or wood, with the appropriate ratio based on other available data.

For each municipality and regional district, the 2006 population, number of dwellings, and breakdown of dwelling types was obtained from Census Community Profiles. The number of dwellings was adjusted to 2007 figures by comparison with 2007 population data from BC Stats. Dwellings were grouped into four dwelling types - single family house, row house, apartment, and other.

Typical energy requirements for different dwelling types were obtained from the BC Hydro CPR. Dwellings were grouped into the same four dwelling types. Energy requirements were broken down into end uses (heating, hot water, and lights/plug). Regional values were available for the Lower Mainland, Vancouver Island, Southern Interior, and North.

For each regional district, average consumption for each end use was calculated, based on the mix of dwelling types. These figures were then used to calculate the number of homes for each fuel type, using typical efficiencies for heating and hot water. All natural gas was

assumed to be for heating or hot water. Because large multi-family accounts for Terasen Gas are included in the commercial sector, an estimate was made for them. This was based on the percentage of gas used in multi-family dwellings by region, according to the REUS. For electricity, light/plug loads were subtracted from the total, and the remainder was considered to be heating and hot water. Once the number of homes was calculated for electricity and natural gas, this was subtracted from the total number of dwellings. On a regional basis, the number of wood heat homes was calculated using the data from the RWBEC. The remaining homes were split between oil and propane based on the regional results of the REUS.

At a municipal level, the number of homes was calculated for natural gas and electricity in the same manner as at the regional district level. The remaining dwellings were assigned to oil, propane, or wood based on the same ratio as at the regional district level.

3.2 Calibration

Although the BC Hydro CPR provides reasonably good information on average consumption of different dwellings, there is still considerable variation throughout the province. Consumption will vary for a number of reasons, including climate, socio-economic factors, and the number of seasonally occupied dwellings. Socio-economic factors can have a significant role. As an example, West Vancouver uses nearly twice as much natural gas per single family house as does Maple Ridge, although they have a similar climate.

The CPR data is regional, but there can be wide variations in temperature within those regions. To compensate for this, a temperature factor was applied to all calculations. The temperature factor was determined by dividing the heating degree days for the municipality by the average heating degree days for the region.

The other variables that effect consumption are harder to adjust for. Therefore an adjustment factor was applied to each municipality, which was in turn applied to all consumption estimates. Where possible, the adjustment factor was left at 1.00 (no change). But in many cases it was necessary to apply a factor to correct data that did not align with known parameters.

At a regional level, the approximate ratio of heating oil, propane, and wood was known from the REUS. For the Lower Mainland it was necessary to apply an adjustment factor of 0.60 in order to bring oil and propane consumption to a reasonable ratio with wood (which was known from the RWBEC). For Vancouver Island and the Southern Interior the applied factor was 1.00, while for the North a factor of 1.18 was required to achieve the same result.

At a municipal level the discrepancies between municipalities became apparent. In a few cases calculated electricity consumption was greater than the actual electricity consumed, implying that homes used significantly lower electricity than average. In other cases the number of homes calculated to be using electric or gas heat was greater than the total number of dwellings, implying that electricity and gas consumption is higher than average. In these cases an adjustment factor was applied in 5% increments to bring the results to a positive value.

After adjustment factors were applied to individual municipalities, the regional wood consumption, and the ratio between oil, propane, and wood consumption was again

checked, and regional district adjustment factors adjusted if necessary to bring the results in alignment. Final adjustment factors range from 0.60 to 1.20.

4. Limitations

There are significant limitations to this type of analysis. With very little data, either province-wide or local, available to check the results, how closely they align with actual consumption is largely unknown. What information is available (REUS, RWBEBC, other inventories) is at a regional level, and with accuracy limitations of its own. The further the estimates are broken down (municipal vs regional) the greater the potential for error. At the municipal level, the results should probably be considered “order of magnitude”.

While the adjustment factor allows for calibration of the results at the regional level, at the municipal level they are used to adjust results that are obviously wrong (e.g. negative values). There is no way of knowing whether the new value after adjustment is reasonable or not.

One of the most significant limitations is the division of other fuels into heating oil or propane. This is based solely on the REUS, at a regional level. This is a very broad assumption, and the actual heating oil/propane split will likely vary considerably from one community to another.

5. Results

Estimated total provincial consumption as shown in the table below.

Residential Energy Consumption – BC Total

Fuel	Energy (GJ)	Percentage
Natural Gas	82,092,728 ¹	46.2%
Electricity	68,667,515	38.7%
Heating Oil	7,514,881	4.2%
Propane	6,156,046 ²	3.5%
Wood	13,122,978	7.4%

¹ Natural gas does not include apartments classified as commercial by Terasen Gas.

² Propane includes piped propane systems in Whistler, Revelstoke, and Granisle.

The only available data for comparison is the estimate from the ICE Fund levy, which indicated total residential, commercial, and industrial heating oil consumption at about 15 million GJ. As residential would be expected to make up the largest component of this, the estimated consumption appears reasonable, at least in order of magnitude.

Regional District consumption is shown in the table below:

Residential Energy Consumption – Regional Districts

Regional District	Heating Oil (GJ)	Propane (GJ)	Wood (GJ)
Alberni-Clayoquot Regional District	214,488	36,979	261,602
Bulkley-Nechako Regional District	98,502	267,382	731,131
Capital Regional District	2,368,936	410,180	862,929
Cariboo Regional District	145,033	394,237	848,942
Central Coast Regional District	12,306	33,653	71,517
Central Kootenay Regional District	358,369	630,696	751,295
Central Okanagan Regional District	42,916	75,712	377,761
Columbia-Shuswap Regional District	121,504	213,882	1,072,327
Comox Valley Regional District	414,126	71,408	505,006
Cowichan Valley Regional District	465,769	80,315	567,961
East Kootenay Regional District	151,848	266,775	318,989
Fraser Valley Regional District	265,874	393,178	211,631
Fraser-Fort George Regional District	90,801	246,835	672,830
Kitimat-Stikine Regional District	22,591	61,585	166,844
Kootenay-Boundary Regional District	152,246	267,872	319,269
Metro Vancouver	801,368	1,187,613	636,274
Mount Waddington Regional District	174,987	30,109	213,921
Nanaimo Regional District	820,187	141,464	999,861
North Okanagan Regional District	55,087	97,039	485,766
Northern Rockies Regional District	5,020	13,591	37,375
Okanagan-Similkameen Regional District	78,267	138,038	689,192
Peace River Regional District	71,283	193,322	529,661
Powell River Regional District	73,507	155,105	259,946
Skeena-Queen Charlotte Regional District	21,422	58,469	157,980
Squamish-Lillooet Regional District	36,256	63,930	429,614
Stikine Region	13,160	35,574	98,157
Strathcona Regional District	303,721	52,310	370,880
Sunshine Coast Regional District	49,668	104,757	175,732
Thompson-Nicola Regional District	85,640	150,977	754,479

Note: Propane does not include piped propane systems in Whistler, Revelstoke, and Granisle.

Because of accuracy limitations at the municipal level, consumption data has not been provided where it is deemed insignificant or “de minimis” (The International Panel on Climate Change defines de minimis as being less than 5%). Municipal consumption is shown in the table below:

Residential Energy Consumption – Municipalities and Unincorporated Areas

Regional District	Municipality	Heating Oil (GJ)	Propane (GJ)	Wood (GJ)
Alberni-Clayoquot Regional District	Port Alberni	140,117	24,162	170,857
Alberni-Clayoquot Regional District	Tofino	5,824	1,004	7,100
Alberni-Clayoquot Regional District	Ucluelet	15,503	2,674	18,901
Alberni-Clayoquot Regional District	Unincorporated Areas	53,044	9,139	64,744
Bulkley-Nechako Regional District	Burns Lake			
Bulkley-Nechako Regional District	Fort St. James	2,400	6,520	17,804
Bulkley-Nechako Regional District	Fraser Lake	1,797	4,885	13,323
Bulkley-Nechako Regional District	Granisle	2,220	6,027	16,472
Bulkley-Nechako Regional District	Houston	3,209	8,719	23,800
Bulkley-Nechako Regional District	Smithers	3,711	10,085	27,511
Bulkley-Nechako Regional District	Telkwa	2,020	5,482	15,001
Bulkley-Nechako Regional District	Unincorporated Areas	79,615	216,081	591,051
Bulkley-Nechako Regional District	Vanderhoof	2,957	8,031	21,930
Capital Regional District	Central Saanich	40,045	6,915	
Capital Regional District	Colwood	69,226	11,956	
Capital Regional District	Esquimalt	115,358	20,020	41,906
Capital Regional District	Highlands	13,785	2,378	5,045
Capital Regional District	Langford	139,315	24,067	50,887
Capital Regional District	Metchosin	17,561	3,030	
Capital Regional District	North Saanich	20,986	3,620	
Capital Regional District	Oak Bay	66,348	11,466	
Capital Regional District	Saanich	584,191	100,974	213,245
Capital Regional District	Sidney	41,294	7,146	
Capital Regional District	Sooke	129,038	22,271	47,183
Capital Regional District	Unincorporated Areas	381,750	65,886	139,590
Capital Regional District	Victoria	727,127	126,492	263,404
Capital Regional District	View Royal	22,912	3,959	
Cariboo Regional District	One Hundred Mile House	672	1,828	
Cariboo Regional District	Quesnel	14,530	39,534	84,954
Cariboo Regional District	Unincorporated Areas	117,664	319,750	688,967
Cariboo Regional District	Wells	1,733	4,712	10,135
Cariboo Regional District	Williams Lake	10,435	28,412	60,963
Central Coast Regional District	Unincorporated Areas	12,306	33,653	71,517
Central Kootenay Regional District	Castlegar	21,307	37,518	44,642
Central Kootenay Regional District	Creston	18,656	32,861	39,071
Central Kootenay Regional District	Kaslo	12,507	22,001	26,235

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Central Kootenay Regional District	Nakusp	12,946	22,777	27,150
Central Kootenay Regional District	Nelson	10,287	18,140	
Central Kootenay Regional District	New Denver	6,212	10,928	13,031
Central Kootenay Regional District	Salmo	4,748	8,359	9,949
Central Kootenay Regional District	Silverton	2,930	5,152	6,150
Central Kootenay Regional District	Slocan	3,394	5,974	7,115
Central Kootenay Regional District	Unincorporated Areas	265,380	466,986	556,435
Central Okanagan Regional District	Kelowna			
Central Okanagan Regional District	Lake Country	4,631	8,158	40,830
Central Okanagan Regional District	Peachland			
Central Okanagan Regional District	Unincorporated Areas	25,353	44,715	223,253
Central Okanagan Regional District	West Kelowna			
Columbia-Shuswap Regional District	Golden	8,517	15,013	75,052
Columbia-Shuswap Regional District	Revelstoke	7,599	13,386	67,017
Columbia-Shuswap Regional District	Salmon Arm	8,118	14,298	71,598
Columbia-Shuswap Regional District	Sicamous	11,235	19,797	99,046
Columbia-Shuswap Regional District	Unincorporated Areas	86,033	151,388	759,613
Comox Valley Regional District	Comox	80,533	13,892	98,158
Comox Valley Regional District	Courtenay	84,984	14,672	103,486
Comox Valley Regional District	Cumberland	21,824	3,762	26,624
Comox Valley Regional District	Unincorporated Areas	226,785	39,082	276,737
Cowichan Valley Regional District	Duncan	32,849	5,681	39,919
Cowichan Valley Regional District	Ladysmith	55,408	9,555	67,557
Cowichan Valley Regional District	Lake Cowichan	27,202	4,691	33,170
Cowichan Valley Regional District	North Cowichan	126,816	21,876	154,568
Cowichan Valley Regional District	Unincorporated Areas	223,495	38,512	272,747
East Kootenay Regional District	Canal Flats	4,857	8,540	10,194
East Kootenay Regional District	Cranbrook	9,254	16,276	
East Kootenay Regional District	Elkford	8,203	14,423	17,216
East Kootenay Regional District	Fernie	9,146	16,076	19,202
East Kootenay Regional District	Invermere	15,029	26,394	31,587
East Kootenay Regional District	Kimberley	13,858	24,325	29,139
East Kootenay Regional District	Radium Hot Springs	10,779	18,964	22,608
East Kootenay Regional District	Sparwood	7,956	13,992	16,693
East Kootenay Regional District	Unincorporated Areas	72,766	127,786	152,935
Fraser Valley Regional District	Abbotsford			
Fraser Valley Regional District	Chilliwack			
Fraser Valley Regional District	Harrison Hot Springs	13,377	19,788	10,644
Fraser Valley Regional District	Hope	18,254	26,993	
Fraser Valley Regional District	Kent	16,967	25,093	13,503
Fraser Valley Regional District	Mission	28,388	41,975	
Fraser Valley Regional District	Unincorporated Areas	136,323	201,552	108,539
Fraser-Fort George Regional District	Mackenzie	4,724	12,843	35,009

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Fraser-Fort George Regional District	McBride	2,345	6,370	17,389
Fraser-Fort George Regional District	Prince George	52,283	142,203	387,176
Fraser-Fort George Regional District	Unincorporated Areas	28,661	77,839	212,606
Fraser-Fort George Regional District	Valemount	2,788	7,580	20,650
Kitimat-Stikine Regional District	Hazelton	379	1,034	2,801
Kitimat-Stikine Regional District	Kitimat	7,189	19,607	53,057
Kitimat-Stikine Regional District	New Hazelton	1,801	4,908	13,309
Kitimat-Stikine Regional District	Stewart	2,548	6,942	18,833
Kitimat-Stikine Regional District	Terrace	4,628	12,624	34,159
Kitimat-Stikine Regional District	Unincorporated Areas	6,046	16,469	44,685
Kootenay-Boundary Regional District	Fruitvale	4,507	7,935	9,445
Kootenay-Boundary Regional District	Grand Forks	10,281	18,096	21,550
Kootenay-Boundary Regional District	Greenwood	3,453	6,071	7,245
Kootenay-Boundary Regional District	Midway	3,361	5,909	7,056
Kootenay-Boundary Regional District	Montrose	2,664	4,684	5,591
Kootenay-Boundary Regional District	Rossland	5,549	9,763	11,635
Kootenay-Boundary Regional District	Trail	8,010	14,103	
Kootenay-Boundary Regional District	Unincorporated Areas	113,805	200,224	238,670
Kootenay-Boundary Regional District	Warfield			
Metro Vancouver	Anmore	1,696	2,509	
Metro Vancouver	Belcarra			
Metro Vancouver	Bowen Island	12,902	19,085	10,266
Metro Vancouver	Burnaby	130,166	192,996	
Metro Vancouver	Coquitlam	61,487	91,052	
Metro Vancouver	Delta	51,437	76,116	
Metro Vancouver	Langley City	11,754	17,441	
Metro Vancouver	Langley DM	83,523	123,548	
Metro Vancouver	Lions Bay	1,468	2,172	
Metro Vancouver	Maple Ridge			
Metro Vancouver	New Westminister			
Metro Vancouver	North Vancouver City	13,067	19,406	
Metro Vancouver	North Vancouver DM			
Metro Vancouver	Pitt Meadows			
Metro Vancouver	Port Coquitlam	53,789	79,610	
Metro Vancouver	Port Moody			
Metro Vancouver	Richmond			
Metro Vancouver	Surrey			
Metro Vancouver	Unincorporated Areas			
Metro Vancouver	Vancouver	220,395	327,213	
Metro Vancouver	West Vancouver			
Metro Vancouver	White Rock	8,122	12,049	
Mount Waddington Regional District	Alert Bay	2,856	491	3,492
Mount Waddington Regional District	Port Alice	22,062	3,799	26,950

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Mount Waddington Regional District	Port Hardy	34,300	5,907	41,889
Mount Waddington Regional District	Port McNeill	27,523	4,735	33,652
Mount Waddington Regional District	Unincorporated Areas	88,247	15,177	107,939
Nanaimo Regional District	Lantzville	11,028	1,900	13,462
Nanaimo Regional District	Nanaimo	364,441	62,913	443,817
Nanaimo Regional District	Parksville	59,960	10,344	73,075
Nanaimo Regional District	Qualicum Beach	24,699	4,258	30,127
Nanaimo Regional District	Unincorporated Areas	360,060	62,049	439,380
North Okanagan Regional District	Armstrong			
North Okanagan Regional District	Coldstream			
North Okanagan Regional District	Enderby			9,107
North Okanagan Regional District	Lumby			
North Okanagan Regional District	Spallumcheen			
North Okanagan Regional District	Unincorporated Areas	32,633	57,430	288,080
North Okanagan Regional District	Vernon	18,477	32,607	162,590
Northern Rockies Regional District	Fort Nelson	5,020	13,591	37,375
Okanagan-Similkameen Regional District	Keremeos	1,656	2,920	14,588
Okanagan-Similkameen Regional District	Oliver	1,712	3,022	15,065
Okanagan-Similkameen Regional District	Osoyoos	4,739	8,369	41,663
Okanagan-Similkameen Regional District	Penticton			
Okanagan-Similkameen Regional District	Princeton			
Okanagan-Similkameen Regional District	Summerland	4,029	7,107	35,467
Okanagan-Similkameen Regional District	Unincorporated Areas	62,050	109,401	546,599
Peace River Regional District	Chetwynd	1,933	5,247	14,349
Peace River Regional District	Dawson Creek	12,920	35,067	95,915
Peace River Regional District	Fort St. John			
Peace River Regional District	Hudson's Hope	2,800	7,589	20,814
Peace River Regional District	Pouce Coupe			
Peace River Regional District	Taylor			
Peace River Regional District	Tumbler Ridge	10,054	27,256	74,745
Peace River Regional District	Unincorporated Areas	36,583	99,175	271,948
Powell River Regional District	Powell River	17,938	37,865	63,405
Powell River Regional District	Unincorporated Areas	55,569	117,239	196,542
Skeena-Queen Charlotte Regional District	Masset	3,248	8,870	23,940
Skeena-Queen Charlotte Regional District	Port Clements	1,991	5,433	14,691
Skeena-Queen Charlotte Regional District	Port Edward	340	927	2,507
Skeena-Queen Charlotte Regional District	Prince Rupert	4,333	11,842	31,902

Skeena-Queen Charlotte Regional District	Queen Charlotte	3,754	10,244	27,688
Skeena-Queen Charlotte Regional District	Unincorporated Areas	7,756	21,154	57,253
Squamish-Lillooet Regional District	Lillooet	5,811	10,241	68,911
Squamish-Lillooet Regional District	Pemberton	1,914	3,377	22,661
Squamish-Lillooet Regional District	Squamish	3,471	6,130	41,048
Squamish-Lillooet Regional District	Unincorporated Areas	22,782	40,150	270,132
Squamish-Lillooet Regional District	Whistler			
Stikine Region	Unincorporated Areas	13,160	35,574	98,157
Strathcona Regional District	Campbell River	127,116	21,905	155,124
Strathcona Regional District	Gold River	16,827	2,897	20,555
Strathcona Regional District	Sayward	5,367	924	6,554
Strathcona Regional District	Tahsis	13,312	2,293	16,251
Strathcona Regional District	Unincorporated Areas	138,795	23,893	169,586
Strathcona Regional District	Zeballos	2,304	397	2,811
Sunshine Coast Regional District	Gibsons	2,433	5,139	
Sunshine Coast Regional District	Sechelt	4,558	9,618	
Sunshine Coast Regional District	Sechelt Ind Gov Dist	909	1,917	3,214
Sunshine Coast Regional District	Unincorporated Areas	41,768	88,083	147,809
Thompson-Nicola Regional District	Ashcroft	1,959	3,455	17,244
Thompson-Nicola Regional District	Barriere	6,704	11,815	59,087
Thompson-Nicola Regional District	Cache Creek			
Thompson-Nicola Regional District	Chase			
Thompson-Nicola Regional District	Clearwater	2,424	4,271	21,361
Thompson-Nicola Regional District	Clinton			
Thompson-Nicola Regional District	Kamloops			
Thompson-Nicola Regional District	Logan Lake			6,424
Thompson-Nicola Regional District	Lytton	675	1,190	5,955
Thompson-Nicola Regional District	Merritt	3,184	5,617	28,028
Thompson-Nicola Regional District	Unincorporated Areas	55,334	97,515	487,693

Note: Propane does not include piped propane systems in Whistler, Revelstoke, and Granisle.

6. Future Updates

The analysis performed could be updated in future years. However, much of the data is only updated periodically. Census data is only available every five years, while the BC Hydro CPR and REUS are only updated every two to three years.

The analysis relies heavily on the Wood Emissions Study, which was published in 2005. It is not known whether there are any plans to update this study. Although wood consumption is not likely changing significantly (since many communities now limit wood burning appliances in new construction), there will undoubtedly be some change over time. The price of other fuels may also impact the amount of wood consumption.

Future updates would benefit from more data on actual consumption quantities. It may be possible to have the Ministry of Finance implement a system whereby consumption could be tracked more accurately through carbon tax revenues or the ICE levy. Fuel suppliers could also be surveyed.

7. Conclusions

There is virtually no data available on actual oil, propane, or wood consumption, even at a provincial level. There are various sources of information that allow estimates of consumption to be calculated. Most of this data is at a regional level, making analysis at a municipal level considerably less accurate. Variations in energy consumption between communities compound the problem.

It was necessary to use adjustment factors to make the results align with what information was available. This should make regional results more accurate, but there is no way of knowing how accurate the municipal levels results are. Another concern is that the split between oil and propane is based on regional levels, while individual communities may have significantly different ratios.

Because of these accuracy concerns, the results should be used with caution. If the figures are to be incorporated into the CEEI reports, the data limitations should be clearly noted.

For many communities the combined oil and propane consumption is less than 5% of the total GHG emissions, and/or the wood consumption is less than 5% of the total energy. These values can be considered de minimis, and left out of the CEEI reports for those communities. As the smallest values have the highest potential error (in percentage terms), this would be recommended.

It would be advisable to develop a long term strategy to improve the accuracy of the results. The province could potentially track sales through the carbon tax or ICE levy. Surveys of suppliers could also provide more accurate estimates.