SW BC proportion of BC Hydro grid activity

BC Hydro Customer Information Management—Load Analysis
BC Hydro, Burnaby, British Columbia

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SW BC proportion of BC Hydro grid activity

Introduction

Within BC Hydro, references are often made to the substantial contribution of Lower Mainland plus Vancouver Island customers to activity on the BC Hydro grid. Usually, the population of SW BC is estimated to create 75% of demand (rate at which electric energy is used at a given instant or averaged over an hour, kW) or consume this proportion of the energy (GWh) delivered by the system.

Three different ways of judging the contribution of the SW BC (Lower Mainland plus Vancouver Island) populations to activity on the grid are presented in this document.

Data sources

Data was obtained from the BC Hydro Distribution Load Shape Estimator (DLSE) database.

Methods

The values for the BC Hydro system load distribution were extracted from the DLSE database for the four sales regions for fiscal year 2007–2008. These actual values (GWh) included transmission plus distribution customers.

Electrically heated energy distribution in BC was tabulated using actual values of annual energy (GWh) consumed by residential electrically-heated buildings during fiscal year 2007–2008.

BC Hydro electrically heated demand distribution in BC was tabulated using modeled values of power (kW) for residential electrically-heated buildings for the coincident BC Hydro system peak on January 28, 2008 (17:00 Pacific Time).

Results

The three different ways of looking at the contribution of Lower Mainland plus Vancouver Island populations to activity on the grid are set out in Tables 1, 2, and 3 and summarized in Figure 1. Sales Regions are as indicated in Figure 2.

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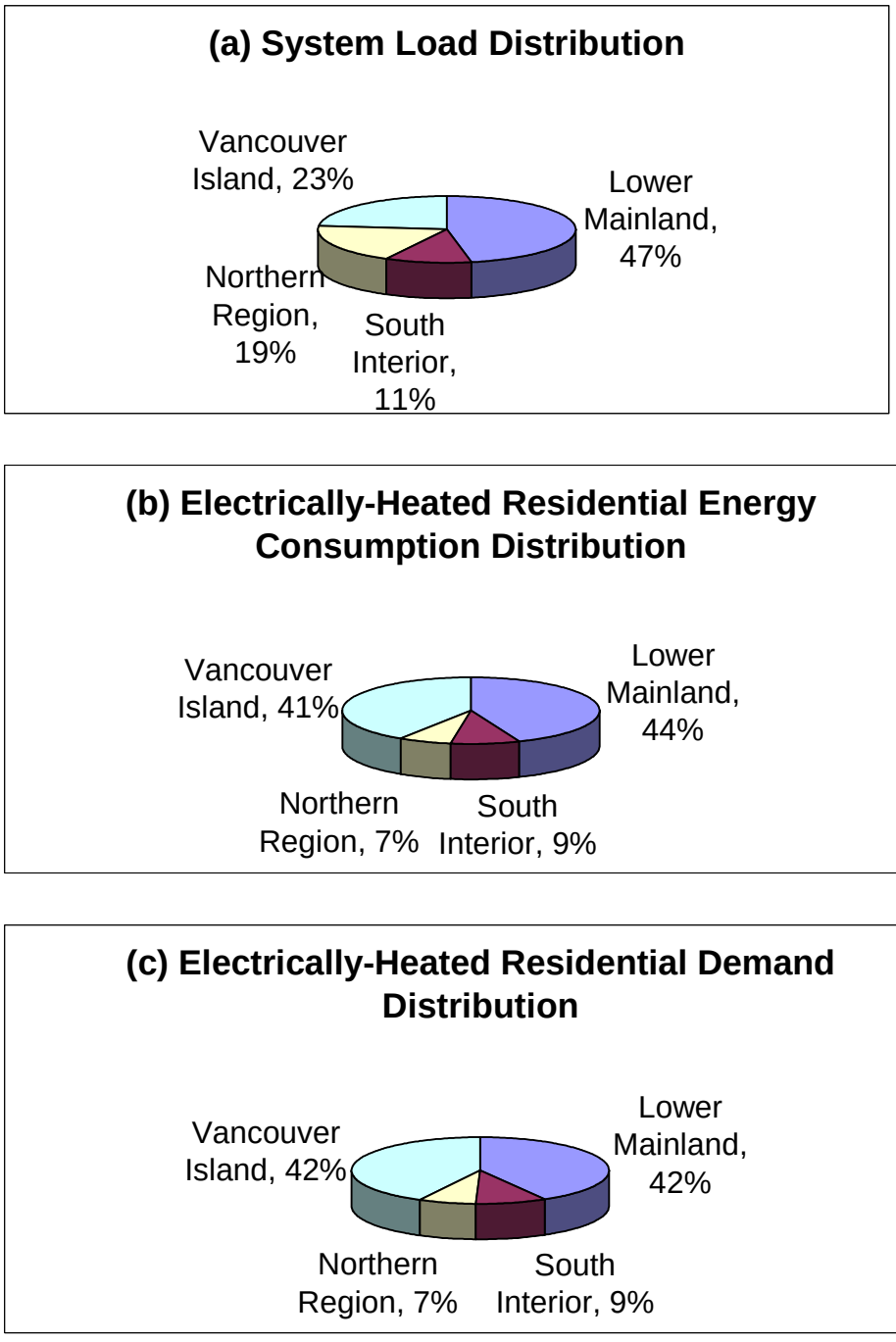

Figure 1: Three different ways of judging SW BC (Lower Mainland plus Vancouver Island) contributions to BC Hydro grid activity

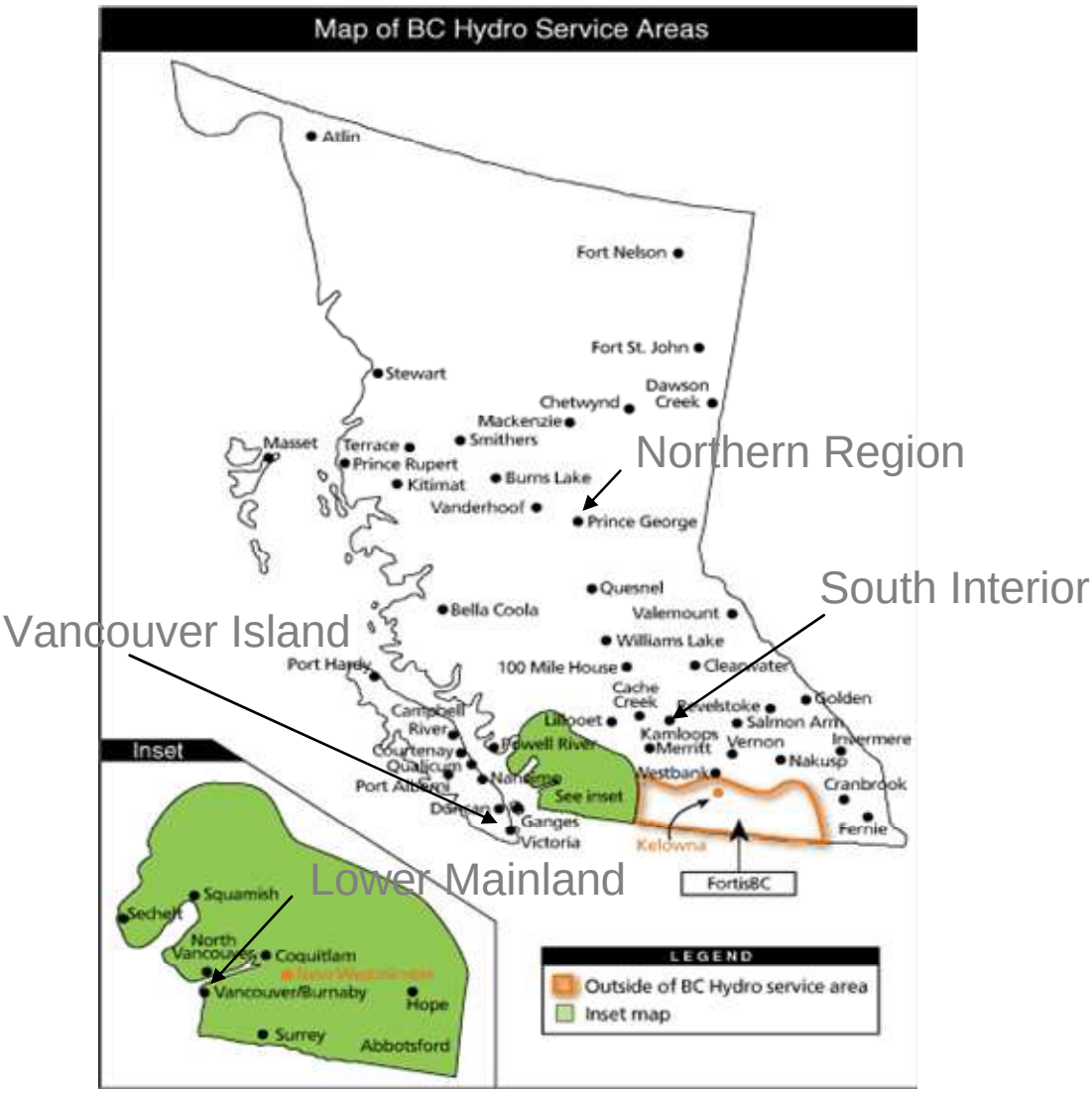

Figure 2: BC Hydro Sales Regions with corresponding weather stations (Service Areas map source is http://hydroweb/genius/contacts/bc_hydro_offices.html; Sales Region designations were added by author of this report)

Table 1

BC Hydro System Load Distribution in British Columbia
Fiscal year 2007-2008

Sales Region	Weather Station	Load (GWh)	Proportion of BC (%)
Lower Mainland	Vancouver	24,241	47%
South Interior	Kamloops (Kelowna)	5,672	11%
Northern Region	Prince George	9,828	19%
Vancouver Island	Victoria	12,038	23%
Total BC		*51,779*	*100%*

Note: System Load includes Transmission + Distribution customers

Lower Mainland + Vancouver Island	***70%***

Data Source: BC Hydro Distribution Load Shape Estimator (DLSE) Database

Table 2

BC Hydro Electrically Heated Energy Distribution in British Columbia
Fiscal year 2007-2008

		Residential Electrically Heated Buildings (Annual Energy, GWh)												
Sales Region	Weather Station	High-Rise Apt Common	High-Rise Apt Suites	Low-Rise Apt Common	Low-Rise Apt Suites	Low-Rise Apt Unconnected	Mobile	Other	Row House Unconnected	Row Houses Common	Row Houses Units	Single/Duplex	Total Energy (GWh)	Proportion of BC (%)
Lower Mainland	Vancouver	272	488	78	198	57	7	43	77	60	574	1,447	3,301	44%
South Interior	Kamloops (Kelowna)	14	50	7	29	8	13	22	4	3	48	451	649	9%
Northern Region	Prince George	4	29	8	22	11	11	11	4	0	13	405	518	7%
Vancouver Island	Victoria	53	117	46	102	25	42	33	15	12	170	2,457	3,072	41%
Total BC		*343*	*684*	*139*	*351*	*101*	*73*	*109*	*100*	*75*	*805*	*4,760*	*7,540*	
Total BC (%)		*5%*	*9%*	*2%*	*5%*	*1%*	*1%*	*1%*	*1%*	*1%*	*11%*	*63%*		*100%*

Data Source: BC Hydro Distribution Load Shape Estimator (DLSE) Database

Lower Mainland + Vancouver Island	***85%***

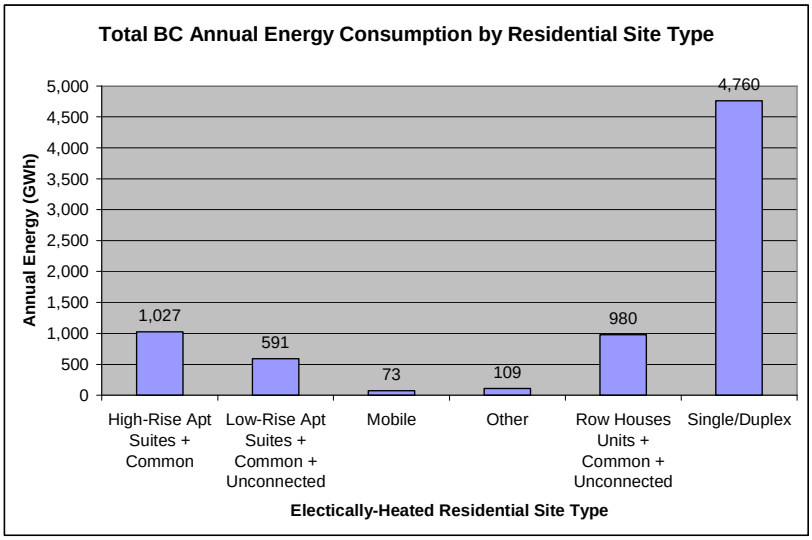

Figure 3: Chart of total BC annual energy consumption by electrically-heated residential site type. Energy data for site types was condensed from Table 2

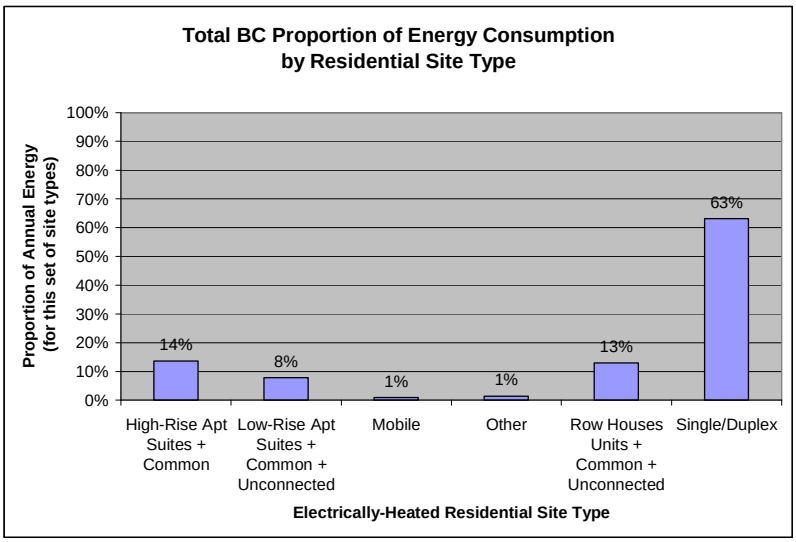

Figure 4: Chart of total BC proportion of energy consumption by electrically-heated residential site type. Energy data for site types was condensed from Table 2

Table 3

BC Hydro Electrically Heated Demand Distribution in British Columbia

Coincident BCH System Peak on January 28, 2008 (17:00)

		Residential Electrically Heated Buildings (Demand, kW)												
Sales Region	Weather Station	High-Rise Apt Common	High-Rise Apt Suites	Low-Rise Apt Common	Low-Rise Apt Suites	Low-Rise Apt Unconnected	Mobile	Other	Row House Unconnected	Row Houses Common	Row Houses Units	Single/Duplex	Total Demand (kW)	Proportion of BC (%)
Lower Mainland	Vancouver	49,790	144,901	14,178	58,766	10,418	830	5,356	17,241	13,428	128,991	394,789	838,687	42%
South Interior	Kamloops (Kelowna)	2,734	15,501	1,329	9,035	1,504	1,620	2,812	1,022	646	11,238	128,778	176,218	9%
Northern Region	Prince George	807	8,863	1,520	6,790	2,064	1,451	1,383	883	88	3,177	115,797	142,822	7%
Vancouver Island	Victoria	10,074	36,490	8,844	31,618	4,864	5,469	4,315	3,595	2,728	39,991	702,204	850,194	42%
Total BC		*63,406*	*205,755*	*25,871*	*106,209*	*18,851*	*9,370*	*13,865*	*22,740*	*16,890*	*183,397*	*1,341,568*	*2,007,921*	
Total BC (%)		*3%*	*10%*	*1%*	*5%*	*1%*	*0%*	*1%*	*1%*	*1%*	*9%*	*67%*		*100%*

Data Source: BC Hydro Distribution Load Shape Estimator (DLSE) Modeled Load with 10% loss

Lower Mainland + Vancouver Island	*84%*

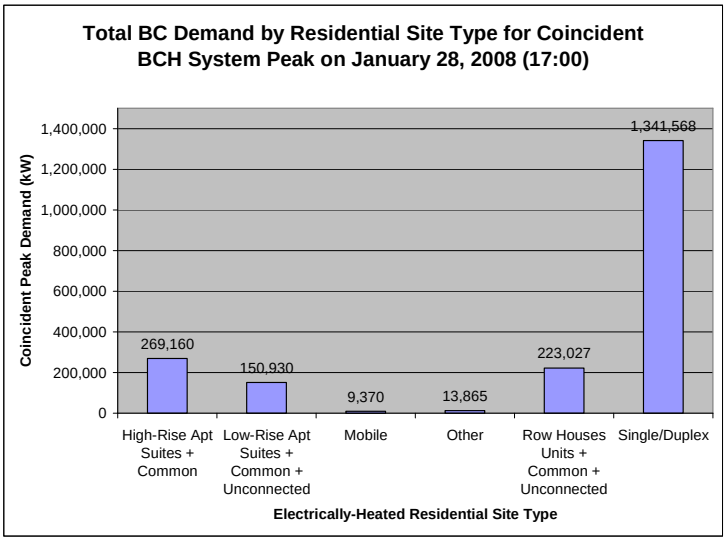

Figure 5: Chart of total BC demand by electrically-heated residential site type for the coincident BC Hydro system peak on January 28, 2008 (17:00). Demand data for site types was condensed from Table 3

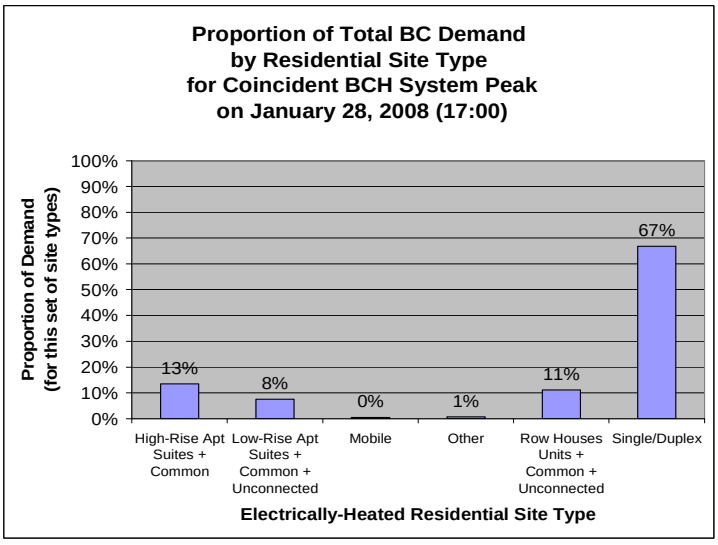

Figure 6: Chart of proportion of total BC demand by electrically-heated residential site type for the coincident BC Hydro system peak on January 28, 2008 (17:00). Demand data for site types was condensed from Table 3

Conclusions

For system load distribution, the population of SW BC (Lower Mainland plus Vancouver Island) represented 70% of the BC Hydro system total load during fiscal year 2007–2008. When the analysis focused on residential electrically-heated buildings, SW BC consumed 85% of the BC Hydro distribution grid total energy delivered to these buildings. Electrical demand by residential electrically-heated buildings in SW BC represented 84% of the BC Hydro distribution grid total electrical demand of these buildings.