

## Greenhouse gas (GHG) auditing—Gabriola & Qualicum Beach

The publication of the BC Community Energy and Emissions Inventories (CEEI) will offer lots of opportunity for comparing communities' GHG emissions. At the time of writing this (June 4, 2010), Gabriola's CEEI audit, which will be for 2007, is not complete, but we do have the [Islands Futures audit](#) for Gabriola for 2008, which has almost the same objectives as the pending CEEI audit.

Comparing the "Islands Futures for Gabriola" audit with the CEEI Qualicum Beach audit, which is currently available, offers an opportunity to compare methodologies as well as emissions. I chose Qualicum Beach for this purpose because it offers interesting opportunities for comparing an island community such as ours with a fairly similar, but more densely populated, "ferry-less" Vancouver Island community.

Although the two audits are for different years (2007 and 2008), I have made no attempt to fiddle the numbers to take this into account. Hopefully, it won't make a difference for present purposes.

### *Profiles*

	Gabriola	Qualicum Beach
population	4296	8766
land area (ha)	57.6	11.3
density (people/ha)	74.6	775.5

Qualicum Beach's population is almost exactly twice Gabriola's, so comparisons will need to be done on a *per capita* basis.

### *Units*

All GHG units in the following are tonnes CO<sub>2</sub> equivalent.

### *Transportation*

	Gabriola	Qualicum Beach
vehicles	5912	31900
bus	0	332
float-planes & boats	693	–
ferry	2870	0
TOTAL	9475	32232
TOTAL <i>per capita</i>	<b>2.21</b>	<b>3.68</b>

Notes:

1. Vehicle emissions were only analyzed as gasoline or diesel in the Gabriola audit. In the Qualicum Beach audit there were 7 different types of vehicle identified (small car,

large car, truck/SUV, commercial, tractor trailer, motorhomes, motorcycles). The ratio of gasoline to diesel GHG emissions on Gabriola was 4.6, and in Qualicum Beach, 8.3.

Despite the fact that Gabriola has a ferry and no bus, GHG emissions for transportation from Gabriola appear to be less. This draws attention however to a difference in methodology that might be at least partially responsible for this. Gabriola's audit uses the fuel-sales approach to estimate vehicle emissions while the CEEI estimates are based on ICBC figures for vehicle registrations. On Gabriola, the two methods produce very different results, see [the note](#) for example. If instead of the preferred fuel-sales approach we had used the ICBC registrations approach, the Gabriola audit might have looked something like this:

<b>NOT from Gabriola 2008</b>	Gabriola	Qualicum Beach
vehicles	14686	31900
bus	0	332
float-planes & boats	693	–
ferry	2870	0
<b>TOTAL</b>	<b>18249</b>	<b>32232</b>
<b>TOTAL <i>per capita</i></b>	<b>4.25</b>	<b>3.68</b>

Without the ferry, the *per capita* figures are virtually identical, **3.58** for Gabriola and **3.68** for Qualicum Beach. This is to be expected of course when you use average figures, which is what the Gabriola audit was trying to avoid.

### ***Electricity***

	Gabriola	Qualicum Beach
	1279	2147
<b>TOTAL <i>per capita</i></b>	<b>0.30</b>	<b>0.24</b>

These figures cannot be really be compared because the CEEI audit uses a different, and lower, emission factor. See [the note](#) for an explanation of why the Gabriola auditors think this is wrong.

***Fuel (heating, cooking, etc.)***

	Gabriola	Qualicum Beach
propane	1370	260
natural gas	0	9748
wood	–	11
oil	258	1741
TOTAL	1628	11760
TOTAL <i>per capita</i>	<b>0.38</b>	<b>1.34</b>

The explanation for these very different *per capita* figures is that Qualicum Beach has access to natural gas, which is a fossil fuel, while Gabriola uses wood instead, which is not a fossil fuel.

If you do count the emissions from burning wood as a GHG, then Gabriola's *per capita* would rise to about **1.08**, which is still less than Qualicum Beach's.

***Waste***

	Gabriola	Qualicum Beach
	609	940
TOTAL <i>per capita</i>	<b>0.14</b>	<b>0.11</b>

This is interesting because the auditors for Gabriola considered Gabriola's number to be surprisingly low compared with the pro-rated number for the Regional District of Nanaimo. Qualicum Beach's number is even lower.

***Food***

	Gabriola	Qualicum Beach
	2340	–
TOTAL <i>per capita</i>	<b>0.54</b>	–

The inclusion of indirect emissions from food production for Gabriola reflects the island's interest in this. The figure is only for transportation costs; it does not include agricultural and food processing emissions, so in a sense, Gabriola's number is a place-holder pending more research on such emissions.

## Bottom lines

The bottom line by direct comparison, that is taking no account of the different methodologies, is as follows;

	Gabriola	Qualicum Beach
transportation (incl. ferry)	9475	32232
electricity	1279	2147
heat	1628	11760
waste	609	940
food (transportation only)	2340	–
<b>TOTAL</b>	<b>15331</b>	<b>47079</b>
<b>TOTAL <i>per capita</i></b>	<b>3.57</b>	<b>5.37</b>

If we take the “let’s give Qualicum the benefit of the doubt in all cases” approach by accepting transportation emissions based on ICBC numbers and by accepting burning wood as a GHG generator, even though this is what nature does in a fire-ecology, then the bottom line would be:

	Gabriola	Qualicum Beach
transportation (incl. ferry)	18249	32232
electricity	1279	2147
heat	4623	11760
waste	609	940
<b>TOTAL</b>	<b>24760</b>	<b>47079</b>
<b>TOTAL <i>per capita</i></b>	<b>5.76</b>	<b>5.37</b>

Clearly, it’s the methodology that makes most of the difference. This re-inforces the conclusion that such estimates are useful for year-to-year comparisons, but not place-to-place comparisons, especially when indirect emissions are added. [See note](#) for further discussion of this.