Greenhouse gas (GHG) auditing—imports and exports

Confining an audit of greenhouse gas (GHG) emissions to a specific geographic area like Gabriola poses questions of methodology. If methods of counting GHG differ from place to place, then although such audits may be useful for comparing one year with another in any particular area, they are not useful for directly comparing the performances of different places. You can't have a fair competition without a level playing field.

The first question Gabriola-specific auditing poses is, are emissions resulting from the activities of people who live on Gabriola, when they are not on Gabriola, to be included in the audit? If I fly to New Zealand, or drive to Victoria, for example, should the GHG from the fossil fuel that is burnt in my so doing go to Gabriola's account? If not, then to whose account should it go?

The second question is, are emissions resulting from the manufacture of goods and the production of food brought to Gabriola from elsewhere to be included? If somebody on Gabriola lays a concrete foundation, should the emissions made in the manufacture and transport of that cement be included in Gabriola's account even though the cement plant might be a long way away?

Both questions are simple to answer in principle, but the results of the audit will only be comparable with the results of similar audits conducted elsewhere if those other audits use exactly the same principles as we do. If you count GHG emissions resulting from the manufacture of something as being to the account of the manufacturer (or service provider), and you also count the GHG emissions resulting from the consumption of something to the account of the consumer, then the GHG emissions are being counted twice. For organizations that want to be able to add all the GHG emissions of communities together to arrive at a meaningful grand total, this presents an accounting problem. However, this does not necessarily mean that the method should not be used by communities who want to honestly assess their own performance.

In many or most cases, allocating GHG emissions to the end-users makes perfect sense because it is the demands of the end-users that create the GHG. Electricity is a good example.

We do actually generate a small amount of hydroelectricity on Gabriola from the run-off from Hoggan Lake, but the bulk of what we consume is obviously generated elsewhere. To say that we are not responsible for GHG emissions from electrical power generators not located on the island is to side-step responsibility for them. Although most of BC's electrical power is hydroelectric with no significant GHG emission, it is sometimes necessary for BC Hydro (BCH) to import power from Alberta or the USA to meet a peak demand in winter. So, if I install an electric space heater that is only used on exceptionally cold winter days, I am contributing to the amount of GHG that Alberta or the USA has to emit in order to meet my demand, and I am therefore to a certain extent responsible for that. You can blame it all on Alberta or the USA, but that is not a very effective way of persuading me to investigate alternatives to using an electric space heater.

Another example is the ferry. To insist on a frequent, fast ferry service to the island, and then attribute the GHG generated by providing such a service to some entity other than Gabriola is to dodge responsibility for GHG generated by the ferry. If there's no responsibility, then there is no pressure to improve.

But what about manufactured goods? Of course, we like not having to account for the GHG emitted in producing whatever goods are in our shopping bags. That way, we can wag our fingers at, say, China. But that's hypocritical. If we don't want China to generate so much GHG, we should stop buying things they make that require that they generate GHG, and if we live in BC, we should call for a halt to the export of coal to China.

But is it practical to charge GHG emission to the end-users in all cases, desirable though that may be? Sure, in theory, we could look in the shopping bags of everyone coming off the ferry and assign each purchase a number to be added to Gabriola's GHG account, but it's hardly practical. Similarly, in theory, we could ask everyone coming off the ferry with suitcases where they've been and how much GHG was involved in their travels, but again, it's hardly practical.

So in practice, all you can do is make illogical decisions as to what to include and what not. If the aim of the audit is to change the behaviour of people living in a specified area, it makes sense to include only those items that are, more or less, within the control of the people living in that area. To do otherwise would result in a per capita GHG emission number that is not much different from the per capita GHG emission number of the whole province, or even of the whole country. Also we have to recognize that some GHG emissions are the result of choices of individuals, not of communities; how much air travel per year being one of them.

One solution to the import/export problem might be to actually recognize double counting and do it nevertheless. For example, if the BC Ferry Service (BCFS) has to account for all of the GHG it emits, and at the same time the GHG emitted in providing a service to Gabriola goes to the account of Gabriola, then there is incentive both for BCFS to acquire more fuel-efficient ferries and take other steps to reduce GHG, and for Gabriolans to consider moderating their demands for ferry service in order to improve their GHG account. The GHG is counted twice, but that, you could argue, reflects the reality that no single body is responsible for it.

Additional Note 1:

The Island Futures 2008 greenhouse gas inventory for Gabriola calculated that Gabriola emitted 15331 tonnes equivalent of CO_2 (tCO2e) in 2008. This amounts to 3.6 tCO2e per capita. This compares favourably with the 2007 figure for BC as a whole, which based on Natural Resource Canada energy database figures, was 3.9 tCO2e per capita made up of about 1.0 tCO2e for household use (space heating, water heating, appliances, etc.) and about 2.9 tCO2e for personal and passenger transportation. For Canada as a whole, the figure is 4.2 tCO2e per capita.

The Gabriola figure explicitly included GHG emitted by the island's ferry and for transportation of food to the island ; however, it did not include any allowance for off-island services, off-island food production, or off-island goods and building materials brought to the island. For BC as a whole, the Natural Resource Canada energy database figures give for non-domestic activities (freight transportation, commercial/institutional sector, industry, agriculture) a total of 6.5 tCO2e per capita (not including electricity), which brings the total per capita GHG emissions including electricity generation for BC up to 10.6 tCO2e. This compares favourably with the 2007 figure for Canada as a whole, which is 15.4 tCO2e per capita, a number that is inflated compared to BC because electricity generation in the remainder of Canada uses much more fossil fuel.

If we assume for the moment, that all goods, services, food, etc. used by Gabriolans are produced in BC, we can crudely estimate that the islands total GHG production = $3.6 \times (10.6/3.9) =$

9.8 tCO2e per capita. That is, the Island Futures inventory actually only represents (3.6/9.8) = 37% of the total emissions needed to support the Gabriola lifestyle.

If we want to be even more pessimistic (accurate?) and assume for the moment, that all goods, services, food, etc. used by Gabriolans are produced in Canada, we can crudely estimate that the islands total GHG production = 3.6 × (15.4/3.9) = 14.2 tCO2e per capita. That is, the Island Futures inventory actually only represents (3.6/15.4) = 23% of the total emissions needed to support the Gabriola lifestyle. Given that much of our food is produced in the US and elsewhere and much of the goods we use are imported from parts of Asia that rely mostly on coal for energy, this estimate might not be too far of the mark.

Additional Note 2:

The issue of imports was highlighted recently by a study by Glen Peters at the Centre for International Climate and Environmental Research in Oslo. His study showed that in the period 1990–2008, rich countries that have ratified Kyoto had cut their production of GHG by 6%, but at the same time, they had increased the GHG-content of imported goods from developing countries by six times this amount.

It seems to me that one way of overcoming this problem is for us to adopt a double-entry accounting method for GHG, just as is used by bookkeepers for money. Instead of debits and credits, we would have production and consumption, every entry recording a GHG emission would be balanced in the books by an entry of identical value recording a consumption calling for a GHG emission. That way, both producers and consumers would be dealing with the same set of numbers in the equivalent of a financial statement. ◊