

## **Auditing greenhouse gas emissions—a double-entry bookkeeping method for communities**

Confining an audit of greenhouse gas (GHG) emissions to a specific geographic area 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.

The first question area-specific auditing poses is, are emissions resulting from the activities of people who live in the area, when they are not in the area, to be included in the audit? If a resident of the area takes an overseas flight, or makes a long car journey, should the GHG from the fossil fuel that is burnt in so doing go to the area'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 into the area from elsewhere to be included? If somebody lays a concrete foundation, should the emissions made in the manufacture and transport of that cement be included in the area'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. 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 anyone wanting to be able to add all the GHG emissions of communities together to arrive at a meaningful grand total, this presents an accounting problem.

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.

Most areas, especially if they are small communities, do not generate their own electricity. But to say that they are not responsible for GHG emissions from electrical power generators not located within the area is to side-step responsibility for them. Although most of British Columbia's (BC) electrical power is hydroelectric with no significant GHG emission, it is sometimes necessary for BC Hydro to import power from Alberta or the USA to meet a peak demand in winter. So, if someone installs an electric space heater that is only used on exceptionally cold winter days, that person is contributing to the amount of GHG that Alberta or the USA has to emit in order to meet that demand, and that person is therefore to a certain extent responsible for that. It could all be blamed on Alberta or the USA, but that is not a very effective way of persuading someone to investigate alternatives to using an electric space heater.

Another example is public transportation. To insist on a frequent, fast transportation service, ferries for example, and then attribute the GHG generated by providing such a service to some entity other than those who use it, BC Ferry Services for example, is to dodge responsibility for GHG generated. If there's no responsibility, then there is no pressure to change habits.

But what about manufactured goods? Of course, everyone likes not having to account for the GHG emitted in producing whatever goods are in their shopping bags. That way, they can wag

their fingers at, say, China. But that's hypocritical. If everyone wants China to generate less GHG, they should stop buying things that China makes that require that they generate GHG.

One solution to the import/export problem might be to actually recognize double counting and do it nevertheless. For example, if a transport provider has to account for all of the GHG it emits, and at the same time the GHG emitted in providing a service goes to the account of those that use the service, then there is incentive both for the service provider to improve fuel efficiency and take other steps to reduce GHG, and for people using the service to consider moderating their demands in order to improve their GHG account. The GHG is counted twice, but that, it could be argued, reflects the reality that no single body is responsible for it.

It seems to me that what's needed is a double-entry accounting method for GHG, just as is used by bookkeepers for money. Instead of debits and credits, there should be production and consumption, every entry recording a GHG emission being 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.

Production in this system means the production of GHG, not unburned fuel.<sup>1</sup> For personal car usage within a specified area, there would be an entry for both production and consumption to that area's account. For personal car usage outside the area, there would be an entry for production in the account of the destination or transit area, and an equal entry for consumption in the account of the home area. For public transport, there would be an entry for production in the account of the service provider, and again an equal entry for consumption to the passenger's home area account. Accounting for manufactured goods would entail an entry of the full amount involved in manufacturing and transporting that product to the end user's area account, balanced by entries for the manufacturer and for the companies involved in transportation. In developing the procedures for manufactured goods, it would be necessary to use a "GHG added" approach that mirrors the "value added" approach widely used for taxation.

This accounting method would require a lot of paper work for sure. Whether it would be worth it, would be for users of the information to decide. However, it would get rid of some of the hypocrisy engendered by simple "cash flow" accounting. You shouldn't be able to demand that somebody else create GHG on your behalf—supply you with concrete for example—and then turn around and say it wasn't me that did it. Like money, where everybody's income is somebody else's expense, somebody's demand requiring GHG production is somebody else's willingness to supply it. It's the whole that balances, not either of the sides. ◇

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<sup>1</sup> Not all "fossil fuel" is used for energy production by burning, and in the future, some utilities may use carbon sequestration which upsets the equation unburnt fuel = GHG. So although some might say that the export of say coal should be penalized, while this is true, given that the accounting is already complicated enough, I would favour not including fossil fuel until it's actually burnt to produce GHG. Pressure to reduce the burning of GHG-generating fuel will ultimately translate into pressure to reduce its production by mining and pumping.