

The purpose of allocational (i.e., inventory) GHG accounting methods is *to assign responsibility* for emissions and removals to entities, such as companies. Ideally these inventoried quantities can be summed to produce a total for all entities in a population applying the same method (i.e., [additivity](#)). For example, the sum of all national GHG emission inventories produces a total for global anthropogenic emissions without double counting or omissions.⁵ By assigning responsibility to a company for emissions from specific sources (ideally exclusively⁶), emissions from these assigned sources (and removals from assigned sinks) can be totaled and tracked over time, thereby allowing reduction targets to be established (e.g., a 50% reduction in total corporate emissions from 2010 to 2030).

In contrast, the purpose of consequential methods is to inform decision-making regarding the choice of actions to take (*ex-ante*) as well as evaluate the impact of past actions (*ex-post*) by quantifying all of the changes in emissions *caused* by an isolated action (i.e., an intervention) regardless of where the impact occurs. In other words, the GHG accounting boundaries of a consequential method extend to include whatever GHG emitting or removing processes are altered by the intervention (i.e., any sources that are different in the intervention scenario relative to the no intervention scenario are included in the boundary), while processes that remain unaltered, directly or indirectly, by the intervention (i.e., are the same in the intervention and no-intervention scenarios) are excluded from the accounting.

An allocational method can be used to quantify changes in emissions and removals relative to emissions and removals occurring in another, typically earlier, time period. While a consequential method quantifies changes in emissions and removals relative to emissions and removals occurring in the same time period but in an alternative scenario (e.g., absent the intervention). Both types of methods, though, produce a time series of estimates, but their respective time series represent two different types of physical quantities.

Problems arise when allocational (inventory) GHG accounting methods are used as the basis for choosing which action will result in lower emissions to the atmosphere. Allocational methods will not account for changes in emissions over time that occur outside a subject's defined inventory accounting boundary. Any impact outside of that boundary caused by the actions under consideration will be overlooked.⁷ For example, companies can be misled into implementing actions that lower their emissions inventory while inadvertently increasing global emissions relative to the alternative of not taking that action. Allocational methods are also generally unable to evaluate the impact of actions because even the changes in emissions from sources that are within the inventory accounting boundary of an entity will typically be affected by many factors (e.g., weather, process changes, production changes). A trend in inventoried

⁵ International aviation and marine bunkers are treated as "entities", akin to countries, for the purpose of identifying total global anthropogenic emissions.

⁶ Exclusive allocation (i.e., assignment of responsibility) enables additivity across accounting subjects (i.e., sum of the parts equal the whole). Further, the less exclusively that emissions are allocated the more that responsibility is effectively assigned collectively, resulting in a dilution of accountability.

⁷ One approach that attempts to address this limitation in allocational methods is to expand GHG inventory boundaries to extreme limits (e.g., corporate life cycle inventories also referred to as Scope 3) hoping that all possible effects of a decision will occur within the inventory accounting boundaries. An obvious problem with such an approach is that the emissions data and calculations for sources and sinks unaffected by the decision are unnecessary (i.e., wasted effort) for the evaluation of impact.

