Best Practice LCA: Water Footprinting in GaBi, December 9th 2014

Questions and Answers

The following are questions and the corresponding answers from the PE INTERNATIONAL webinar titled "Best Practice LCA: Water Footprinting in GaBi" which took place on December 9th 2014. The questions are in no particular order.

Q: If you want to balance waste water which flow you use as input?
A: In a typical product model, you will have a water provision process (e.g. Tap water), that accounts for all the elementary inputs. The water is passed from one process to the other as operating material (e.g. "Process water") and finally ends up in the waste water treatment plant (tracked input: "water (waste water, untreated)"). The waste water treatment is the last step in the process chain and has only elementary flows as output.
Q: You mentioned that water from hydropower plant is considered under "turbine" in the balance. When I realise the balance for the plan "electricity grid mix DE" I see most of water is documented under water "river water". Could you please explain it? Could you also explain again how water from hydropower plant is handled? Thanks
A: "Water (River water)" is the typical INPUT into a hydropower plant. The OUTPUT is "Water (river water from technosphere, turbined)", referring to the water that is used instream through the turbines. Additionally, the models account for water that is evaporated from barrier lakes based on data from *Pfister et al. 2011 (Int J Life Cycle Assess (2011) 16:580–591*). However, in the meanwhile there is a larger discussion around assessing water consumption related to hydropower generation (see e.g. *Bakken et al 2013: Hydrol. Earth Syst. Sci., 17, 3983–4000, 2013 www.hydrol-earth-syst-sci.net/17/3983/2013/; doi: 10.5194/hess-17-3983-2013*). One is around the multipurpose use of barrier lakes that might contribute irrigation water in dry months, thus showing negative water consumption values. Another discussion is around the net water accounting approach, i.e. that only water evaporated from a barrier lake compared to the original state (river and natural vegetation) should be accounted for. With its yearly update routine PE will consider such developments in future updates of the database.
Q: Does PE also realise review for water footprint according to the ISO?
A: Since the standard was only published some months ago, we have not conducted any review against the standard so far. But in principle that would be possible.
Q: Is it correct to say if ISO 14046:2014 will be whole and sole standard to carry out water footprint of a product in a process in industries as part of continual improvement for saving water!!!
A: The ISO 14046 is an attempt to reach consensus on framework and principles of water footprint assessments. ISO standards will always be accepted reference to do such assessments. However, it cannot be said it will be the only one (comparable to carbon footprint standards). E.g. the Water footprint standard of the Water footprint Network will exist as an alternative standard. Please also note that the ISO standard does not recommend specific methods so far; but the UNEP SETAC WULCA group is working on a consensus method. All that means that so far there is not the single one method to calculate "the" water footprint.
Q: Why should we look at the total green water footprint of a agriculture crop? Why not look at the additional evaporation if compared to evaporation from natural vegetation?
A: I agree, we also argue that only water from irrigation should be considered in the impact assessment of water use in agricultural processes. The rationale behind this approach is the assumption that there is no environmental impact of green water (i.e. rain water) consumption. Such an effect would only exist if crop cultivation results in alterations in water

evapotranspiration, runoff and infiltration compared to natural vegetation, which is very difficult to assess. Additionally it remains arguable whether or not such changes (if they occur) should be covered by assessment of land use changes rather than in water inventories. However, rain water use is sometimes assessed in different methodological approaches (Water footprint Network) or can be used for specific analyses. The GaBi software allows assessment of both water use including rain water ("Total fresh water use", "total freshwater consumption") and without rainwater ("Blue water use" and "blue water consumption").

Q: Which is the definition of water degradation, I mean which are the parameters and the thresholds to define the degradation?

A: The term "degradative water use" is used to differentiate water use that is used and returned to the watershed, from consumptive use. It refers to the use of water with potentially associated quality alterations and describes the pollution of water (e.g. if tap water is transformed to wastewater during use). These potential alterations in quality are not considered to be water consumption. The classification of flows focuses on changes in water quantity. The changes in water quality are not considered in the flow classification. Such changes (water pollution, release of contaminants or heat into water bodies) can be covered by specific impact categories of LCA (e.g. eutrophication, acidification, ecotoxicity, assessment of thermal emissions). Methods to assess effects of reduced water availability due to deterioration in water quality are still in development. Please see *Boulay A-M, Motoshita M, Pfister S, Bulle C, Muñoz I, Franceschini H, et al. 2014. Analysis of water use impact assessment methods (part a): Evaluation of modeling choices based on a quantitative comparison of scarcity and human health indicators. The International Journal of Life Cycle Assessment: 1-22* for details.