Reviewer's report

Title: Integrating occupational health in life cycle assessment: introducing the work environment disability-adjusted life year

Version: 2 Date: 5 November 2012

Reviewer: David Kriebel

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Major Compulsory Revisions
The authors are to be commended for taking an idea that has been discussed for some time -- including worker health impacts in LCA - and setting about the hard work of demonstrating how it could be done in practice.

That said, the authors might have made a more compelling demonstration by reorganizing the article. First, much of the details in the methods, while technically sound, are not conceptually difficult and would be better placed in an appendix. Second, the article needs a demonstration of how the data resulting from these calculations could be used in an actual LCA. The article stops at the calculation of the NUMBERS of WE-DALYS in an industry. This is several crucial steps removed from the integration of this information into an LCA for a product or specific industrial process. To be more specific - the calculation of the WE-DALY for logging is shown, but how will this number be used to study the comparative impacts of a wooden table versus a plastic one, for example?

A second important issue is the well-recognized limitations of BLS occupational fatality data. These are notoriously under-reported. While I agree that a correction factor for undercounting could be introduced, it seems too simplistic a solution. It may be that for LCAs of products with fairly similar supply chains, the under-reporting may be arguably similar for the products being compared, so that the relative WE-DALY data may be valid even if important under-counting is likely.

A third issue that I think would improve the paper is a more thorough treatment of the reality of global supply chains. It may be that U.S. data should be used because they are better than nothing, but I think that it might not be difficult to come up with plausible adjustment factors for the higher injury and fatality rates in developing countries. These could for example be based on historical U.S. data that represent the industry say 50 years ago when the technology in the U.S. was similar to what is found in a developing country today.

Minor Essential Revisions
At a minimum, it should be explained how one would use the number of WE-DALY in an LCA. I think one has to get to rates of WE-DALYs, with denominators which represent units of product.
The discussion of interpolation for NAICS codes with missing data should note that 'nearby' 6-digit NAICS codes don't necessarily share common occupational hazards. The "sisters" with common hazards could be assigned through and expert review by hygienists or safety engineers, rather than assuming that similar codes represent similar hazards.

**Level of interest:** An article whose findings are important to those with closely related research interests

**Quality of written English:** Acceptable

**Statistical review:** No, the manuscript does not need to be seen by a statistician.

**Declaration of competing interests:**

'I declare that I have no competing interests'