

The risk of Product Environmental Footprints incorrectly recommending energy recovery

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When recycling is beneficial for the environment, LCA results should give incentives to collection for recycling and also to the use of recycled material in new products. Our calculations indicate that a Product Environmental Footprint (PEF), will give incorrect climate incentives for energy recovery of renewable LDPE, when the energy substituted by incineration has 40–200% more climate impact than the Swedish average district heat and electricity. This is because the Circular Footprint Formula (CFF) assigns some of the environmental benefits of recycling to the product that uses recycled materials.

The risk of incorrect incentives for incineration can be reduced through a more careful modelling of energy recovery. We investigate two options:

1. Estimating Factor B in the CFF, based on the observation that waste incineration can be described as a process with multiple jointly determining functions. For Sweden we propose the default value $B=0.6$.
2. Applying a broader systems perspective that accounts for the effects of energy recovery on waste imports and thus waste management in other European countries. We manage the large uncertainties involved by developing two scenarios.

Our suggestions for Factor B and European scenarios both make the CFF more balanced and consistent: it now recognizes that not only recycling but also energy recovery depends on more than the flow of waste from the life cycle investigated. Factor $B=0.6$ almost eliminates the risk of incorrect incentives in a PEF of renewable polymers.

However, neither Factor B nor the broader systems perspective amends the fact that LCA tends to focus on one product at a time. This might not be enough to guide recycling, which requires concerted actions between actors in different life cycles. Assessing decisions in one product life cycle at a time might in this context be compared to independently assessing the action of clapping one hand. It might not result in an applaud.