Stronger together: Combining Integrated Assessment Models with Life Cycle Assessment.

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Integrated assessment models (IAMs) are widely known and used in research and policy-making. IAMs are forward-looking and focus on large-scale changes to human and natural systems, but provide relatively aggregated results. Life cycle assessment (LCA) provides detailed cradle-to-grave environmental analysis for product design and labelling. However, LCA is based on current or historical data. LCA also normally covers a wider range of environmental indicators than IAMs, which are focused on climate change impacts. Using an example of the prospective assessment of electric, autonomous vehicles, I discuss the integration of IAM results into LCA models. Because such integration involves large amounts of data processing and manipulation, clear, transparent, and reproducible workflows are needed; we developed the open source Wurst software library for this purpose. Integrating IAM results changes final impacts for mobility by up to 80%, and is a clear advance on the state-of-the-art for prospective studies. I conclude by weighing the trade-offs of such integrated studies, and provide a perspective on future work.