

Importance of life cycle analysis to changes in design, material selection, bioprocessing and recycling

Bruce Lippke

Professor, Director of Rural Technology Initiative

University of Washington

Seattle, Washington, USA

Using Life Cycle Inventory data and Assessments (LCI/LCA) of key human health and ecosystem risks to analyze the environmental impacts of various building materials, construction subassemblies, design alternatives and production processes has become essential to improving environmental performance. The LCI data on wood products provided by the Consortium of Research on Renewable Industrial Materials (CORRIM) used in conjunction with data on other materials for designing structures in the ATHENA™ Environmental Impact Estimator model (EIE) simplifies the task of understanding best opportunities for improvement. With the increasing focus on climate change and Green House Gas (GHG) emissions, the carbon stored in wood products, which substantially exceeds the emissions from production, has become an important carbon sink. Carbon must be tracked from forests to products to buildings, product substitution and end of life disposition to avoid unintentional policy conflicts. Given ongoing and anticipated changes in fossil energy costs and the value placed on carbon emissions, the motivation for change can be expected to increase. Waste recollection for energy recapture or recycling, once considered cost prohibitive, will become a significant change agent as will more effective use of engineered products and designs. Product and process development such as increased use of biofuels focused on reducing the carbon footprint in conjunction with product selection, design, waste collection for energy recapture and recycling will all be important motivators for future change. LCI/LCA demonstrates the substantial advantages of using wood products from sustainably managed forests.