Life Cycle Assessment

Life Cycle Assessment (LCA) has become the newer name for “life cycle analysis,” which has become an important analytical tool for at least a couple of decades. A “life cycle” was defined by the International Standards Organization as “consecutive and interlinked stages of a product or service system from extraction of natural resources to final disposal.” Hence the life cycle assessment was defined as a “systematic set of procedures for computing and examining the inputs and outputs of materials and energy and the associated environmental impacts directly attributable to the functioning of a product or service system through its life cycle.”

A more detailed discussion of LCA, its strengths and weaknesses, was presented by Muschett to compare its utility with a more comprehensive sustainability impact assessment tool.1 Recently the USEPA has developed a Life Cycle Assessment website containing several supporting documents to help educate users as to how to utilize LCA to reduce energy and natural resource inputs and pollution outputs throughout stages of complex manufacturing processes.2

Because a complete lifecycle assessment can be a daunting quantitative task due to the potential for many stages and multiple impacts, some firms limit using the LCA concept and methods to either certain stages or impacts. This later approach also increases the utility of the LCA approach beyond manufacturing processes.

For example, LCA can be used for specific policy analysis, such as the costs and benefits of a recycling program. Or, the LCA concept can be used to analyze both quantitative and non-quantitative inputs, outputs and impacts from an organization’s operations. An example of a simpler, non-quantitative application is as follows.

Suppose that we wanted to examine church ministry operations and related materials to reduce resource use and environmental impact. Analysis could include evaluating inputs and outputs for office , worship articles/vestments, education activities, fellowship/social activities, maintenance for building and grounds and transportation. For each of these activities we could ask questions regarding product inputs such as whether product is durable, reusuable, made from renewable resources, made from recycled materials, made from compostable materials, made from nontoxic materials, or energyefficient. And for waste products or outputs from these activities, we could ask whether they are reusable, recyclable or compostable.

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1 F. Douglas Muschett, “Sustainability impact assessments: a new comprehensive framework for raising the bar beyond existing environmental assessments,” International Journal of Sustainable Development, Vol. 3, No. 3, 2000, pgs. 257-275.

2 U.S. Environmental Protection Agency, National Risk Management Laboratory