

# **A Sustainable Environment: Our Obligation to Protect God's Gift**

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## **Consider Starting With a Life Cycle Analysis**

As more and more companies learn about the benefits of integrating sustainability into its operations, management must establish a strategic plan on how to achieve that goal. They should not consider environmental issues as an area within the business model, but rather the business must operate within the environment. This was emphasized in a recent book titled "The Big Pivot" by Andrew Winston. Unfortunately, most companies operate in a reactive mode until they decide to take action and become proactive. One way to start on the road to sustainability is to conduct a life cycle analysis on its products or services.

Life Cycle Assessment (LCA) can be defined as a systematic measurement and analysis of the environmental impact caused by a product or process starting from the extraction of raw materials, the production process, use of the product, and disposal of the product including the waste treatment. For each of these steps there will be made an inventory of the use of material and energy and the emissions to the environment. With this inventory, an environmental profile can be established which makes it possible to identify the weak points in the lifecycle of the system studied. These weak points indicate where and how the system is impacting the environment negatively and therefore become the focal points for improving the system from an environmental point of view.

The starting point in this process is to determine which resources have the greatest impact in the production process or the service provided. Is it a raw material, energy, water, or possibly labor? Then the company should conduct the LCA for each of these in order of importance. An example of a company employing this process is MillerCoors which produces over 25 different labels of beer at its California brewery alone where everyone in the state has been experiencing a drought. For a typical brewery, about 35 gallons of water are consumed to produce one pint of beer when calculating the entire water consumption including the growing of malts and hops. At the brewery itself, the ratio of water consumption to beer output is 4:1. However, by conducting an LCA at the brewery, MillerCoors has been able to reduce the consumption of water to less than 3:1.

Another example of a very detailed LCA on energy consumption was conducted several years ago to determine the total energy cost for many of the automobiles manufactured in the world. This study was conducted by a market research firm using data available from automotive reports but without the knowledge of manufacturers or suppliers. This study was so detailed that to measure energy consumption, it included, for example, the distances workers traveled to assembly plants; the use of mass transit and/or private vehicles; the types of vehicles driven; distances from home to plant. This had to be done on site and with phone and mail surveys in native languages and with sufficient responses to be useful. Undoubtedly, the study included all the energy required

in the actual manufacturing of the automobile, the energy consumption during the lifetime use of the automobile, and any energy costs necessary for the ultimate disposal of the car. For electric and hybrid automobiles, a separate life cycle assessment for the batteries was added to the study.

Since over 300 different makes and models were studied, it took about three years to complete the effort. So it was necessary to assume certain costs like \$80 per barrel of oil and \$3.00 per gallon of gasoline. It was also necessary to assume a lifespan for each different automobile. This assumption, of course, had a significant impact on the final results. Once all of this information was included in the LCA, the final cost per automobile was in dollars and cents per mile for the life of the car.

The results were quite surprising in that the large gasoline consuming cars with longer life expectancies came out with lower lifetime costs than hybrids. This was because assumptions were made for the replacement of batteries for the hybrids as well as a shorter lifetime for the hybrids. The average total cost of all automobiles sold in the U.S. was \$2.28 per mile over the lifetime of the car. The most expensive SUV was the Hummer H3 at \$1.95 per mile while the Toyota Prius hybrid was \$3.25 per mile. On the other hand, a Toyota Corolla was only \$0.73 per mile over the lifetime of the car. This shows that when conducting a life cycle assessment of a product, you can determine its true cost and its impact on the environment. This type of analysis allows a company to alter its operations in order to benefit the environment and its bottom line. Just another example showing that you need to measure in order to manage.