LCAT from LCAnalytics for Environmental Impact Assessment of Computers

Case Study: Environmental Impact of Notebook AC Adapters & Batteries

LCAnalytics

The growing use of computers and electronics is a significant environmental concern. Manufacturers and consumers are increasingly conscious of their impact on the environment; however, no tool exists to accurately model the environmental impact of personal computers and components. LCAnalytics is a company that provides accurate and easy-to-use tools to fill this need.

LCAT

LCAnalytics Tool, LCAT, provides:

- Accurate assessment of a computer's impact on global warming, human health, and nature.
- High precision estimates based on component-level analysis.
- Estimates based on more accurate assumptions than existing models, which only use industry-wide averages.

The development of LCAT was based on:

- Professional disassembly, material and process analysis of computers and components.
- Review of recent literature and documentation.
- Correlation of product manufacturer specifications with environmental impact.
- Industry-standard LCA software, including the Ecoinvent database.
- ISO 14000 series requirements

Team

The team at LCAnalytics consists of experts from academia and industry with a passion for the environment:

Shiva Nanda of Newport Computers, Professor Venky Venkatachalam of the University of New Hampshire, and Dr. Samudra Vijay of Sam Analytic Solutions, they are assisted by Mike Ernsting, majoring in environmental engineering at Tufts University, and Christopher Schwab, majoring in business administration at the University of New Hampshire.

Case Study: Notebook Batteries

Battery Cells

In calculating the impact of notebook batteries, the most widely used battery technologies should be considered. Previous life cycle studies used an older prismatic cell model, whereas most lithium-ion cells in laptop batteries today use 6 or 9 cylindrical cells. LCAT uses a variable battery model with standard voltage regulation and connector components, using cylindrical cells, adjustable for 6 or 9-cell models.

AC Adapters

It is important to include AC adapters in this system, since compatibility with the battery and power source are crucial to the operation of a laptop computer. LCAT allows for several different input/output connection types, and has developed separate processes for calculating the impact of interchangeable parts, like detachable AC power cables. Additionally, LCAT makes fewer assumptions about components, including such parts as noise-suppressing capacitors, and utilizes OEM information to make model-specific environmental impact predictions.

Electricity Mix

Previous life cycle analysis studies used data from an entirely European electricity mix, which is not an accurate representation of the energy mix used to create these computer components, as most of these are fabricated in Asia. LCAT uses a geographic-region specific electricity mix based on the location of manufacture of the components. LCAT also considers post-consumer waste of components.

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life cycle analytics