LCAT from LCAnalytics for Environmental Impact Assessment of Computers

Case Study: Adjustment factor based on the 80/20 rule

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

Case Study: Adjustment Factor

80/20 Rule

In order to determine the carbon footprint for a large number of devices while maintaining accuracy, LCA considered the 80/20 rule, which is the general idea that 20% of the manufactured components of any device account for 80% of its total carbon footprint (global warming potential in kg CO_2 equivalent). We chose to use 90% as a threshold, rather than 80%, to reduce error caused by using one laptop as a proxy.

ThinkPad T42

LCA started with an extremely precise analysis of an IBM ThinkPad T42 laptop computer. The conclusion of this analysis was that there are 12 distinct components in a laptop that account for over 90% of the total carbon footprint. Within each of these components, there were several key metrics that contributed most of the global warming potential. By comparing these key factors alone to the result from the precise analysis, we were able to find an appropriate adjustment factor.

Impact on LCAT Tool

LCA concluded that an adjustment factor of 1.081 would accurately estimate the total global warming potential for a laptop computer. By measuring only the key factors of the most significant components, laptop computers can be analyzed much more efficiently and the adjustment factor can be used to provide an accurate estimate of the GWP, in kg CO_2 equivalent.

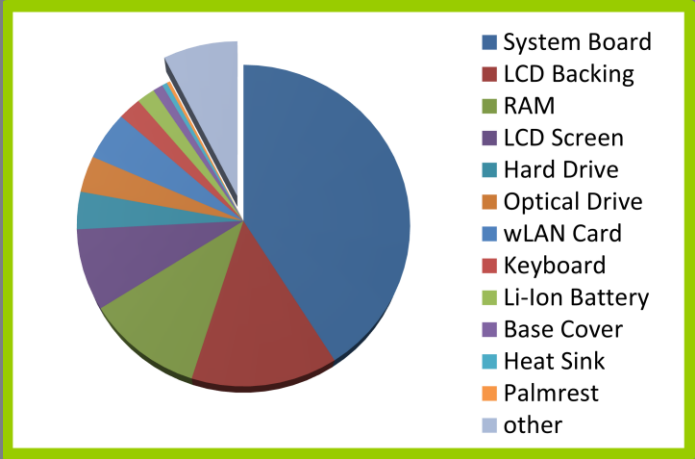

Figure 1: The 12 key components and "other" compared to the whole

For additional information, contact Dr. Samudra Vijay

life cycle analytics