LCAT from LCAnalytics for Environmental Impact Assessment of Computers

Case Study: Environmental Impact of Computer Processors

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 A.R. (Venky) Venkatachalam of University of New Hampshire, Dr. Samudra Vijay of Sam Analytic Solutions, and Travis Miller (graduate student) of Massachusetts Institute of Technology.

Case Study: Computer Processor
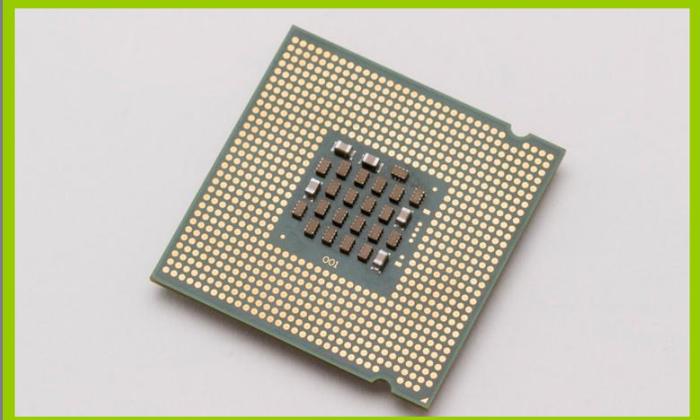
The semiconductor industry which produces the integrated circuits in computer processors is rapidly changing. As designers and manufacturers strive to keep pace with Moore's law, which states that the number of transistors in a processor will double every two years, processor performance and associated production processes are continually enhanced.   It can be a challenge to accurately model the changing semiconductor production processes.

Three recent studies on semiconductor manufacturing and the Ecoinvent database are used in the development of this model. Semiconductor material extraction, transport, manufacturing infrastructure, equipment, and process-specific electricity demands as well as chemical use and disposal are life cycle phases included in this analysis.

The processor's die size and technology generation are input into this LCAT module to assess the processor's environmental impact. LCAt's database contains thousands of computer processors produced in the last decade. Users can input the name, product number, or specifications of a processor and obtain the environmental impact analysis of the processor. Future modules will provide similar information for a variety of computer components based on a computer's specific configuration.

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