

Life Cycle Assessment

An Executive Overview of Applications, Market Drivers
and Business Benefits

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This overview is an excerpt of an independent, unbiased Green Research study and is sponsored by PE INTERNATIONAL.

The full study is available for purchase at greenresearch.com.



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Introduction

Rising demands from customers and regulators for improved environmental performance and increased transparency are driving a surge in interest life cycle assessment (LCA) as a tool for continuous improvement and innovation and a way of improving environmental performance while avoiding burden shifting and unintended consequences. Green Research believes that aggressive use of life cycle assessment and life cycle thinking will become table stakes at leading companies, and those that aspire to lead, over the next two to five years.

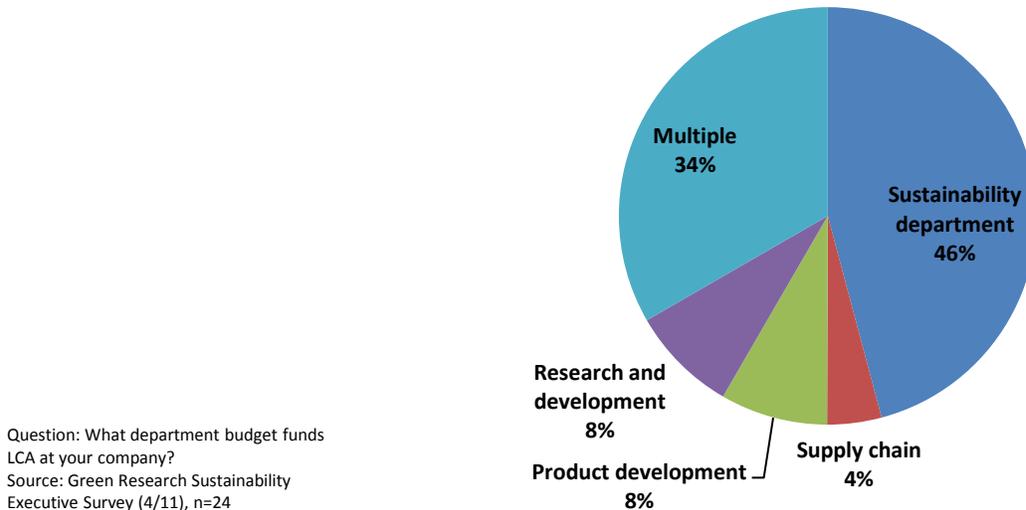
Applications of LCA Range from Efficiency to Innovation to Marketing

LCA is a pliable tool and with multiple applications. Savvy organizations apply it to a range of opportunities. Examples:

- **Production processes.** Companies can use LCA to identify the part of a production process that has the greatest environmental impact so they can focus optimization efforts on that part. Or process engineers can compare two alternative production processes with LCA to select the process with overall superior environmental performance. AkzoNobel has done this.
- **Waste management.** LCA can be used to select among multiple waste management approaches. Recycling may not always be superior to incineration, for example. An LCA can reveal if this is the case.
- **Product and packaging development.** Companies draw on LCA methods in product and packaging design. It can help them select materials with lower environmental impacts. It can guide the development of designs that have lower impacts in the use phase or are easier to recycle. Stonyfield Farm has used LCA to select packaging for its yogurt.
- **Sustainability goals.** A company with internal or public sustainability goals can use LCA to understand the impact of a new process on its ability to achieve those goals. This can give it advance notice that it may need to adjust some internal goals as a consequence of launching a new product or process. AkzoNobel uses LCA in this way.
- **Green marketing.** LCA has communication applications. A rigorous, science-based analysis, conducted in compliance with international standards, provides a sound basis for communicating with customers about environmental performance and progress. LCAs are the basis of environmental product declarations, a communication tool of growing importance.
- **Strategy and risk management.** Some companies use LCA to get a better understanding of their dependence on critical raw materials, the availability of alternative sources and the impacts of those sources, and their exposure to interruptions in supply.

Sustainability Departments Are Funding LCA to a Large Degree

Figure 1 Department Budget that Funds LCA



Corporate interest in LCA has spread beyond engineering and product development teams to marketing, strategy and sustainability departments. LCA tool vendors and consultants tell us they are increasingly meeting with sustainability and marketing executives at their customers' organizations. Indeed, some 46 percent of the executives we surveyed for this research report that the sustainability department at their company funds its LCA work.

Significant Adoption of LCA among Manufacturers and Major Retailers

Figure 2 Manufacturers that Have Adopted LCA

	Formulated Goods	Durable Goods	Retailers
Consumer Products	Coca-Cola, Pepsico, Henkel, Unilever	Dell, ElectroLux, Ford, Hewlett-Packard, Levi Strauss, Motorola, Nokia, Philips, Timberland, Toyota	Alliance Boots, Marks & Spencer, Walmart, Tesco
Industrial Products	AkzoNobel, BASF, LANXESS	Alcatel-Lucent, Armstrong World Industries, Herman Miller	

A broad cross section of companies, including makers of industrial and consumer products, both formulated and durable goods, are already using LCA. Some companies have made a substantial commitment to it. Unilever, for instance, has a policy of understanding the environmental impacts of all of its products, and says it has conducted life cycle assessments on some 1,600 of them. AkzoNobel's policy is to conduct an LCA for any investment of €5 million or more. Herman Miller is working on integrating LCA as a routine part of its product development process. Retailer Tesco has commissioned hundreds of life cycle carbon footprints for its products and has committed to taking a "life cycle view"

to tackle climate change, while Walmart has funded and piloted an open source LCA tool for use with its own private-label products and those of its branded suppliers.

LCA Can Deliver Clear Business Benefits

Major corporations globally are applying LCA to achieve concrete benefits including:

- **Lower costs.** Understanding full life cycle cost can reveal that approaches that had seemed less costly are actually more costly. In view of the full life cycle, companies can make decisions that reduce their total cost. They can identify opportunities to reduce waste.
- **Increase revenues.** Use LCA to convey life cycle benefits to customers to win new business.
- **Respond to customer inquiries.** As more and more companies seek to understand and reduce their environmental impacts, they are increasingly asking their own suppliers to help. It's increasingly common for companies to receive requests from major customers for detailed environmental impact information. Suppliers who conduct LCAs on their products are well prepared to respond to such inquiries, positioning them to sustain those customer relationships.
- **Market access.** Some products require an LCA before they can be successfully marketed. Under the 2007 U.S. Energy Independence and Security Act, for example, a biofuel cannot qualify for the renewable fuels standard unless an LCA shows that it results in at least a 20 percent emissions reduction relative to gasoline and diesel. Green product labels, such as the Green Seal in the U.S. and EU Ecolabel require LCA. And in France legislation known as Grenelle 2 has passed that will require consumer products to carry environmental product declarations (EPDs) based on LCA.
- **Brand enhancement.** Conducting a life cycle assessment gives a manufacturer a sophisticated understanding of the impacts of its products. It demonstrates commitment to understand those impacts, and suggests a commitment to reducing them. Companies that are talking about measuring and reducing their environmental impacts today are perceived as leaders in their industries.
- **Quantitative basis for corporate sustainability.** As companies' sustainability initiatives move from picking low-hanging fruit to organizing the whole company to minimize environmental impacts, a rigorous methodology like LCA becomes essential. It enables companies to make fact-based decisions about where to allocate resources, understand the consequences of their actions, avoid burden shifting, and obtain benchmarks for improvement.

Beyond Low-hanging Fruit, Companies Will Need to Work Harder for Sustainability Gains

The sustainability agenda often gains traction at companies when they pursue relatively easy projects that offer cost savings and reduction in environmental impacts, such as energy-saving lighting retrofits. But once the low-hanging fruit are picked, companies are faced with more challenging questions about how to improve their environmental performance. LCA is increasingly recognized as a tool that enables companies to understand the environmental tradeoffs associated with various courses of action and equips them to make rational decisions after the easy choices are made.

Rising Expectations for Transparency

Expectations that companies will disclose greater information about their environmental performance continue to rise. Bodies such as the Carbon Disclosure Project and the Global Reporting Initiative are driving increasing numbers of companies globally to report carbon and broader sustainability performance. Environmental performance is gaining importance as a dimension of investment analysis. And, according to our executive interviews, customers are increasingly expecting transparent disclosures of the environmental impacts of companies and their products.

As a consequence, retailers like Walmart and Marks & Spencer; packaged goods makers such as Unilever and Procter & Gamble; computer makers like Dell and HP; and manufacturers of industrial products such as AkzoNobel and BASF are beginning to compete on basis of environmental disclosure and performance. All of those companies make prominent use of LCA and a growing number of companies will follow.

Environmental Labeling Schemes Center on LCA

Life cycle assessment has emerged as the foundation of environmental labeling and environmental claims about products. Product manufacturers may be dismayed by the proliferation of environmental labeling schemes. After all, it can be confusing, time consuming and costly to have a product certified once, let alone many times. The good news, though, is that many labeling various programs increasingly place standards-based LCA at their core. (The new Biopreferred label issued by the U.S. Department of Agriculture is an exception.) Standards-based environmental labeling schemes can lower the cost of certification by reducing the diversity of certification criteria.

Anticipation of Regulatory or Other Requirements Motivates Adoption

Companies have repeatedly told us they are investing in LCA “to get ahead” of regulatory requirements. The French Grenelle 2 law, which will require consumer products to carry environmental product declarations (EPDs) based on LCA, is an example. There are expectations that other European countries will follow suit. In general, leading manufactures are starting to expect that the use of life cycle assessment will either be required by regulations or that it will become an expected business practice.

Product and Project Companies Must Incorporate Life Cycle Thinking

Figure 3 Business Benefits of LCA



Any company that manufactures, distributes or works with material products or relies on infrastructure, transportation or utilities on a large scale can get a better grip on its environmental impacts and gain insights about improving them through the use of life cycle methods. LCA can help manufacturers make better, greener products; improve the efficiency of production processes; enhance waste management and recycling procedures; and communicate more authoritatively with customers and other stakeholders.

Be Strategic about What Products to Study

Figure 4 Examples of Strategies for Selecting Products to Study

Company	Strategy	Capability
Dell	First LCAs were of top products in each of three categories	Outsourced studies, managed by internal LCA expert
Unilever	LCA or similar for every product	In house
AkzoNobel	Any investment over €5 million; and products with unique environmental properties	In house
Global Manufacturer with \$11B in revenues	New ventures; products with complex environmental message	In house
Johnson & Johnson	Full-blown LCAs when demanded by important customers or regulatory considerations; use light screening methods other times	Outsource full-blown LCAs; do screening with in-house tools.

Companies should be strategic about which products they choose to analyze with LCAs. But no one strategy suits every company at every stage of its development. In general, analyzing a top-selling product should yield a greater payoff than a study of a lower-volume product, but it naturally depends on the life cycle impacts of each. And products with relatively simple and stable supply chains may be easier to study than products that have global and dynamic supply chains. Some examples we've seen are summarized in the table above.

Avoid LCA Traps

Companies should be wary of using LCAs to make claims relative to competitors' products. LCA practitioners know that despite the scientific basis and the standardized methods, conducting an LCA involves making numerous judgments and assumptions. It is unlikely to obtain the same quality of data for one's own product as one's competitor's product. Even an LCA reviewed and validated by a qualified third party is not immune to questions or attacks. "Avoid my number is better than your number," as Unilever's Henry King, science and technology leader for sustainability, put it. Instead, make internal improvement and stakeholder communication, rather than comparisons with competitors, the focus of your LCA work.

Keep Things Simple When Communicating about LCA to Customers

Conducting and communicating about life cycle assessment allows a company to project environmental competence and seriousness to its customers and other stakeholders. But the output of an LCA is complex. Companies should take care to communicate about them appropriately to customers, hiding technical terminology and emphasizing aspects customers can relate to. Some best practices are:

- **Educate customer on life cycle concepts.** [Levi Strauss](#) and [Apple](#) use attractive graphics to explain life cycle concepts.

Figure 5 Levi Strauss Life Cycle of a Jean Creative



Figure 6 Apple Life Cycle Creative



- **Explain your strategy.** Unilever features extensive information about its life cycle assessment work on its Web site. The company [explains](#) how LCA relates to the company's environmental aims, stating that the company will "Evaluate our environmental impacts at every stage, from sourcing of raw materials for our products all the way through to when our consumers use and dispose of them."
- **Productize LCA Knowledge.** [InterfaceFLOR](#) has a product offering it calls Cool Carpet™ created on the basis of life cycle assessment information: "Our climate neutral Cool Carpet zeros out all greenhouse gas (GHG) emissions associated with the entire lifecycle of our carpet."

About Green Research

Green Research is a research, advisory and consulting firm focusing on cleantech, alternative energy and corporate sustainability. Founded in 2008, we provide syndicated and custom market research, market intelligence and strategic advice to technology companies, enterprises and major brands and investors in the cleantech and sustainability sectors and beyond.

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About the Sponsor

PE INTERNATIONAL is one of the world's most experienced sustainability software, content and strategic consulting firms. With 20 years of experience and 20 offices around the globe, PE INTERNATIONAL allows clients to understand sustainability, improve their performance and succeed in the marketplace. Through market leading software solutions, Five Winds Strategic Consulting Services and implementation methodologies PE INTERNATIONAL has worked with some of the world's most respected firms to develop the strategies, management systems, tools and processes needed to achieve leadership in sustainability.

PE INTERNATIONAL serves more than 1,500 clients with the leading GaBi Software solution for product sustainability and Life Cycle Assessment consulting services including BASF, Bayer, BP, Cisco, Daimler, Dell, Eastman Chemical, ExxonMobil, GM, Herman Miller, Hewlett Packard, Intel, Kraft Foods, Levis Strauss, Timberland, Toyota, Unilever, Volkswagen and more.

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