

# The Business Case for Life Cycle Assessment in US Policy and Legislation

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## **The Business Case for Life Cycle Assessment in US Policy and Legislation**

Life cycle assessment is the basis of environmental policy making throughout the European Union, and it also is broadly used for policy in Japan, Australia, and increasingly across the globe: for example Costa Rica, South Africa and Thailand all have LCA-based policies. It is also being used as a policy instrument in American jurisdictions<sup>1</sup> and by many US companies.

The reason for this trend is clear. Life cycle assessment is a comprehensive, science-based way to measure the environmental performance of product and service systems. It measures the environmental outcomes that policy-makers are trying to achieve. Full LCAs cover all relevant environmental issues and carbon footprinting is a part of every LCA. There is a rich literature of LCA studies to support policy decisions. Over the past forty years, life cycle studies have been performed on everything from petroleum to paper to regulations. There is consensus on LCA practice: most published LCAs conform to international standards, the ISO 14040 series standards.

LCAs can support environmentally preferable purchasing, and thus they create a strong linkage between environmental performance and market forces. The output of an LCA study is a quantified listing of the environmental impacts produced over the product system's life cycle, relative to the social benefit or market value provided by the system (the system function). This listing is sometimes called the ecoprofile and it is the basis of environmental product declarations (EPDs or Type III ecolabels, as described in ISO 14025).

The use of LCA as a policy instrument provides many opportunities for rational and cost-effective environmental decision-making and can provide substantial economic incentives to those organizations embracing environmental sustainability as a business strategy. Many of those opportunities require legislative support and relate to international trade.

### **International Trade**

The Agreement on Technical Barriers to Trade is signed by all members of the World Trade Organization. It states in part that, in developing technical regulations for member central governments

*...technical regulations shall not be more trade-restrictive than necessary to fulfil a legitimate objective, taking account of the risks non-fulfilment would create. Such legitimate objectives are, inter alia: national security requirements; the prevention of deceptive practices; protection of human health or safety, animal or plant life or health, or the environment. ...*

*Where technical regulations are required and relevant international standards exist or their completion is imminent, Members shall use them, or the relevant parts of them...*

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<sup>1</sup> The State of Oregon, the State of California, King County (Washington) and other local jurisdictions use LCA for policy-making.

*Whenever a technical regulation is prepared, adopted or applied for one of the legitimate objectives explicitly mentioned in paragraph 2, and is in accordance with relevant international standards, it shall be rebuttably presumed not to create an unnecessary obstacle to international trade.<sup>2</sup>*

The International Organization for Standardization (ISO) is a sister body to the WTO, and is the body that developed the standards on life cycle assessment and ecolabelling (ISO 14040 series standards, the ISO 14020 standards, and the ISO 21900 standards). It follows that, were they based on the ISO standards, United States government technical standards related to the life cycle environmental performance of products imported into the country would be presumed not to create a barrier to trade.

This means that products made in the USA under stringent environmental regulation could have a competitive advantage over products produced where environmental regulation is lax or poorly enforced. It also means that countries requiring LCAs on imported goods can effectively keep out products in countries where there is a poor LCA infrastructure.

As noted above, one of the uses of LCA is the development of environmental product declarations (EPDs or Type III ecolabels). This label resembles a nutrition label, only it discloses the amount of each environmental impact implied by the product. France is already moving in this field. Regulations are being developed whereby effective 2011, all products sold in France must have an EPD<sup>3</sup>. In 2008, the US exported \$29 Billion of goods to France<sup>4</sup>. It is likely that other countries in the EU will follow France's lead in this matter.

Other European regulations of imports have already had an effect on US companies: REACH (Registration, Evaluation and Authorisation of Chemicals) and WEEE (Waste Electrical and Electronic Equipment), both of which have LCA-based elements, are good examples. Strong LCA legislation and infrastructure in the USA would considerably lighten the burden these programs place on US industry.

### **Rationalization of Environmental Command-and-Control Regulations**

For organizations attempting to comply with extensive, conflicting and stove-piped environmental regulations in the United States, the value of the use of LCA in regulation is clear. Currently, compliance to environmental regulations is expensive, bureaucratic and often of limited environmental benefit. LCA could help assure that overall environmental improvement is achieved at lower overall cost and without causing transfer of environmental burdens.

A case in point is the Clean Air Act regulations. These regulations typically demand that specific technology (Best Available Technology or Maximum Available Control

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<sup>2</sup> Agreement on Technical Barriers to Trade, Article 2.

<sup>3</sup> <http://www2.ademe.fr/servlet/getDoc?cid=96&m=3&id=55101&ref=21479&p1=B>

<sup>4</sup> <http://www.census.gov/foreign-trade/balance/c4279.html#2008>

Technology) be applied to individual stacks. Because the technology is specified in the regulations, there is little incentive to move to more effective and less costly technology as it is developed, and ultimately little incentive to develop such technologies. Sometimes the specified technologies actually cause substantial air pollution. Thus for example, volatile organic emissions are often controlled by adding natural gas and combusting them. The impact of the use of fossil energy and its concomitant climate change and conventional air pollution impacts are ignored. In fact, pollution control as a source of greenhouse gases is tracked through the US greenhouse gas inventory<sup>5</sup>.

Were EPA required to review its regulations on a life cycle basis it could implement regulations based on *all environmental outcomes at once* rather than on technical processes. This is a new approach that would lead to innovation and increased efficiency as well as overall environmental improvement *and* lower costs. The government of the Netherlands regulates on this basis, and each facility has only one permit and one annual report to produce, thus substantially decreasing compliance costs. In the US, it is not unusual to have separate permits for each water outfall and stack, with reporting requirements for each. The decreased permitting costs in the Netherlands provide a competitive advantage to companies operating there.

### **The National Environmental Policy Act (NEPA)**

Over the last forty years, NEPA has required US government agencies to evaluate the life cycle impacts of government actions. Everything from facility construction to the development of policy instruments is subject to NEPA. Unfortunately, the NEPA compliance infrastructure that has been developed over that time is unwieldy, expensive, and time-consuming and does not cover life cycle issues with any rigor. Of particular concern is the need to evaluate cumulative impact, which the Environmental Impact Statement (EIS) does not accommodate well.

The calculation engine of life cycle assessment is specifically designed to address cumulative effects: it adds up environmental impacts over the life cycle of a system and across geography and time. As a result, life cycle experts are increasingly looking at global consequences of policy decisions. While LCA is not well suited to address the site-specific NEPA issues such as the management of archeological sites, using LCA in the NEPA process in lieu of many of the EIS environmental analyses would decrease costs, increase the speed and comparability of studies, and address the issue of cumulative effects. It would bring in the best available science to measure the outcomes of government decisions.

Finally, LCA is designed to measure environmental performance in relation to the social benefits provided by a system. In this respect it is very different from the NEPA process, which only evaluates the system impacts, not the system benefits. This makes it very difficult to decide among options, and strongly supports the do-nothing option. For example, if one is evaluating a transportation infrastructure, it is important to compare the environmental impacts to the *function* the system provides, i.e., rapid transportation of

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<sup>5</sup> U.S EPA 2008 Inventory of U.S. Greenhouse Gas Emissions and Sinks: 1990 – 2006

people and goods rather than simply building miles of roads and rails. A NEPA process currently focuses on the physical infrastructure impacts without asking how well the infrastructure delivers the transportation service. An LCA study would measure the impacts per unit rapid transportation delivered, and the public could see the services they get for the impacts they absorb.

Currently there is a call for NEPA analysis of the stimulus package. Clearly, time is of the essence for the stimulus package, and standard NEPA practice cannot be done in a timely manner. NEPA assurances could be provided quickly by performing LCAs on key program options. This would be especially easy to do for energy and transportation programs, since many LCAs have been performed in these industries and LCA impacts are well understood. These are the very industries that are driving much of the stimulus package expenditures.

### **Externality Markets**

The US has been a leader in markets for environmental impacts through its cap-and-trade programs for oxides of sulfur and nitrogen. There is a clear trend towards cap-and-trade solutions for climate change: these programs will be highly dependent on LCA analyses as the way to assure that all carbon emissions are addressed, not merely moved from one location to another. Existing carbon footprinting standards such as PAS 2050<sup>6</sup> can assist in this matter by providing a basis for measuring carbon credits.

But carbon credits are only the beginning of the kinds of externality markets that can be developed using LCA as the calculation engine. LCA typically calculates the full suite of pollution effects, including smog production (with its huge human health impacts and associated medical costs) and eutrophication (which causes fish kills and other problems in water bodies, thus affecting fisheries). It also can calculate biodiversity loss and water consumption over the life cycle. It is in the public interest that all environmental impacts be minimized through market mechanisms, and LCA is the only technique that is specifically designed as a comprehensive science-based method for measuring environmental performance of systems. It does so in such a way that the environmental impacts are standardized and fungible. This facilitates the creation of markets similar to those that currently exist.

An externality market infrastructure backed by LCA measures holds out the potential to support sustainability quickly and comprehensively. It would help identify the unintended consequences of projects early on, identifying project scenarios that had lower negative externalities. This would provide more social benefits at lower environmental and economic costs.

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<sup>6</sup> British Standards Institute 2008. Specification for the assessment of the life cycle greenhouse gas emissions of goods and services.

## **Summary**

The use of LCA as a policy tool is sweeping the globe. This presents both threats and opportunities for US business. Where countries implement regulations based on LCA, US businesses may not be prepared to compete and may be closed out of those markets. Implementation of LCA in policy in the US can support US companies' global competitiveness by providing LCA infrastructure. Such a structure would reward the companies that have long been complying with stringent US laws and regulations.

Within the US, the broad use of LCA in regulations can decrease compliance costs and increase effectiveness. It can also be used as a basis of externality markets to further decrease the cost of environmental improvement in the country. LCA is a measurement tool: as such, its applicability is broad and its use in policy creates many ways for US business to be globally competitive.