

# Introduction to Life Cycle Thinking



## G.EN.ESI Education Centre

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## Life Cycle Thinking

*"Imagine a pipe with chemical waste that is discharging pollution into a river. Do you add a treatment box onto the end of the pipe and try to mitigate the worst features of what is pouring out, such as filtering it or treating it with additional chemicals. Or do you go back to the process that produces that pollution and research why it is being produced, then change the process so that the discharge no longer occurs?" [1]*

The End-of-pipe approach has been widely used in the past for dealing with environmental issues in an attempt to remedy existing problems generated at production sites. More recently however a new preventive and inclusive approach has been taken: Life Cycle Thinking aims to prevent environmental issues before damage occurs, but without transferring the problem from one system to another, for example to another production site.

## Introduction

Life Cycle Thinking is an approach which involves all the stages and stakeholders in the life cycle of products or services. It follows a "cradle to grave" approach that considers all potential environmental impacts of the product or service, from raw material extraction to manufacturing, distribution, reuse, recycling, energy recovery and disposal (as shown in Figure 1). This approach goes beyond the traditional focus on the manufacturing plant or product characteristics, avoiding the transfer of problems from one life cycle stage or environmental medium to another. The use of a holistic perspective, rather than a narrow point of view, helps companies and policy makers identify possible improvements, in terms of lower environmental impacts and reduced use of resources, across all of the product's life cycle stages.



Figure 1 The environmental product lifecycle

Life Cycle Thinking prevents the implementation of solutions that appeared to be good for the environment but when considering the bigger picture (in terms of product life and environmental issues) are found not to be beneficial for the environment. For example, exchanging an insulation material for one with a lower environmental impact during the manufacturing process, but which also has lower insulation properties for a construction application, may prove to be counterproductive in terms of overall environmental improvement.

## Benefits of Life Cycle Thinking implementation for industry

Companies have realised that in order to be competitive and efficient, product quality and production efficiency are no longer sufficient to deliver competitive advantage. By helping to identify the consequences of business decisions in upstream and downstream phases, life cycle thinking is beneficial for a large number of reasons, such as:

- Understanding which parts of a product's life cycle have the greatest environmental impact;
- Improving market position and customer image through eco-labelling
- Creating of stronger relationships along the supply chain;



- Creating improved relationships with suppliers and customers through development and marketing;
  - Fostering better relationships with authorities, environmental groups and other collaborative partners;
- [2]

### LCT: A central tool for policy makers

Following the shift of emphasis from the end of pipe approach to a more holistic vision of environmental issues, most of the policies regarding product and the environment consider a life cycle perspective rather than focussing on a single phase. For example, the European Commission's "Integrated product policy" uses LCT as the basis for all regulations, and can be used in the following areas:

- Identify market-oriented instruments, e.g. taxes or subsidies, for supporting production and consumption policies;
- Promote eco-innovation;
- Develop resource management strategies, such as optimal waste management;
- Promote better information for consumers through the use of labelling schemes and Green Public Procurement [2].

### Conclusion

For companies, Life Cycle Thinking represents a powerful tool to solve problems that cannot be addressed with other approaches.

To better understand the effectiveness and the added value for enterprises you can find more information within this document <http://genesi-fp7.eu/wp-content/uploads/2013/08/An-Introduction-to-Eco-design.pdf>, where the benefits of Eco-Design for companies are explained.

### Further Reading

There is a great deal of information available on Life Cycle Assessment and its implementation. Rather than reproducing it, we would recommend that you follow the links below for further information:

- <http://www.setac.org/>  
The Society of Environmental Toxicology and Chemistry (SETAC), which is a not-for-profit organisation, composed of institutions, individual members, businesses and governments. SETAC was conceived as the first forum for interdisciplinary communication amongst environmental scientists. At present, thanks to its multidisciplinary approach, it is broader in concept and application than many other societies;
- <http://ec.europa.eu/dgs/jrc/>  
The Joint Research Centre which provide scientific advice and technical know-how to support a wide range of European Union policies. The JRC addresses key societal challenges whilst stimulating innovation through developing new methods, tools and standards, and sharing its know-how with the Member States, the scientific community and international partners;
- <http://www.unep.org/publications/default.asp>  
The United Nation Environment Programme. This web platform has been created to share research content and knowledge about climate change, environmental performance, resource efficiency, chemical and other waste and much more;
- <http://www.epa.gov/>  
The United States environmental protection agency whose mission is to protect human health and the environment through the development and enforcement of regulations, teaching people about the environment and helping companies to understand requirements.

### REFERENCES

- [1] End of pipe, the Zero Waste Institute, [http://zerowasteinstitute.org/?page\\_id=1067](http://zerowasteinstitute.org/?page_id=1067)  
[2] Making sustainable consumption and production a reality, Joint Research Centre

