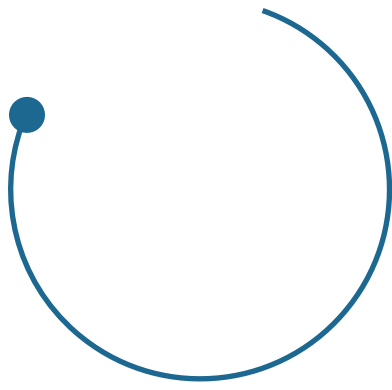


VALUE ALONG LIFE CYCLE

Life Cycle Assessment

- Extended Producer Responsibility
- Environmental Product Declaration
- Product Carbon Footprint



Regulations prescribing Extended Producer Responsibility (EPR) are growing; customers are increasingly demanding Environmental Product Declaration (EPD) and Product Carbon Footprint (PCF). The standards and guidances to conduct EPD and PCF are varied. Life Cycle Assessment tempered with experience and assisted with software tools and data bases are essential for navigating through the evolving regulatory, customer and trade requirements.

LIFE CYCLE MANAGEMENT

Extended Shared Responsibility

SOURCING

Within supply chain, the companies are required to examine how inputs are created. Were the agricultural inputs grown in a sustainable way, using water appropriately, and on land appropriate for the crop? Were chemicals processed in energy-efficient plants? Are procured materials recycled or renewable? Are materials input used for the product environmentally friendly while still fulfilling product specifications? What are the labor and human rights practices in the supply chain?

MANUFACTURING

As the companies have direct and/or better control over manufacturing, most companies are able to address this segment of life cycle effectively. Here the strategies include improved efficiencies of resource and energy use; for product stewardship; recycle and reuse wastes and minimise the impacts. In addition, product labelling & information, design and consequent manufacturing operations have significant impact on use life of product and also its reusability or recyclability.

DISTRIBUTION

Companies traditionally have looked only at logistics to incorporate sustainability in supply chain, but there is a next step in the life cycle to improve upon: distribution and the retailer's impact on the environment in terms of energy and storage. Retailers practices in managing outdated/expired products? Packaging? Product take-back etc?

USE

Depending on the product type, the vast majority of environmental impact is incurred as the consumer uses the product. While, it may seem beyond company's control, how consumers interact with a product depends largely on design, product labeling, communication and marketing. What infrastructure is required to extend the product's useful lifetime? Re-engineer? Re-purpose? Re-furbish? Up-cycle?

DISPOSAL

Influencing the consumer toward environmentally sound disposal practices can be done through choices in packaging types, weight, size, labeling and even external initiatives to increase recycling and reuse.

GC SERVICE OFFERINGS

TOOLS AND DATA



Life Cycle Assessments require software tools and Lifecycle data base. At GC we service our client requirements using OpenLCA software tools and Ecoinvent data bases. Depending on client requirements, we deploy other tools and data bases.

COLLABORATION



GC has longterm association with Green Delta and represents OpenLCA in this geography.



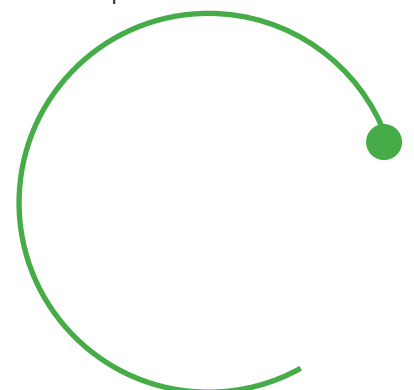
We conduct Life Cycle Assessments with multiple tools and Data Sets:

- Footprints over life cycle to input data for sustainability disclosures like CDP, GRI, DJSI, Ecovadis, USGBC, IR, etc
- Product Carbon footprint (PCF)
- Environmental Product Declaration (EPD)
- Design Alternatives Evaluations
- Life Cycle Cost Analysis
- Environmental and Climate Risk Assessment
- Policy Evaluation and Assessment
- Circular economy - Circular Business Models and Business Performance Improvement

ABOUT GC

GC offers strategic, financial and technical advisory services in renewable energy, energy efficiency, sustainability, CSR and climate change to clients in manufacturing and service sectors and to the public authorities. We offer LCA services to clients across sectors to support their product stewardship and circular economy programs, Environmental Product Declarations including Product Carbon Footprints.

www.generalcarbon.in



Experience and Expertise Across sectors sample LCA Client Engagements

Chemicals

For Aroma Chemical Manufacturing Company, majorly dealing with B2B engagements, GC has assisted in fulfilling their requirements of the regulations of environmental clearance by conducting LCA of their 100 products in a duration of 4 weeks. The study using the Cradle to Grave approach focussed on impact categories Global Warming and Ozone Depletion.

GC performed an LCA for the manufacturing process of a Agro Chemicals company for its several chemical products, including Hexaconazole (92%), Acetamiprid, Kresoxim Methyl, and Triazole. Deploying OpenLCA software tool GC assessed life cycle environmental impacts for each product "from gate to gate".

Electrical

For a Cable Manufacturing Company, GC has conducted a Life-Cycle Assessment of two products using openLCA tool in accordance with the ISO 14040 and ISO 14044 guidelines. It focused on five major aspects for assessing environmental impacts namely Global Warming, Acidification, Ecotoxicity, Human Toxicity and Ozone Layer Depletion.

For an Engine Manufacturing Company, GC assisted in conducting LCA study of a Geneset . The study shows that the use phase contributes maximum to all the impact categories followed by raw material extraction phase and least contribution by manufacturing phase.

Office Equipment

GC conducted a comprehensive LCA of an office chair, from raw materials to disposal for an Environmental Product Declaration using appropriate Product Category Rules. The EPR was further certified. The study analysed the chair's footprint across seven key areas: global warming, acidification, eutrophication, smog creation, ozone depletion, water consumption, and fossil resource scarcity.

Cement & Construction

For a Real Estate Development company, GC employed LCA methodology and framework to assess the environmental impact of building construction, starting with sampling and data collection across raw material extraction, transportation, and construction phases. This cradle-to-gate analysis analyzes a wide range of environmental impacts, including ozone depletion, acidification, eutrophication, global warming, various health effects, and resource depletion. By interpreting and disseminating these results, GC has driven Green practices in design, procurement, use of materials and construction. GC conducted the Life Cycle Assessment of cement throughout its entire life cycle, from material extraction to disposal for a cement manufacturer in India. This comprehensive approach analyzes all stages of the cement's life cycle and quantifies its impacts on key environmental concerns, such as Global Warming Potential, Acidification Potential, Eutrophication Potential and Ozone Depletion Potential.

About Green Delta

Green Delta experts have over 20 years of experience in providing sustainable consulting through Life Cycle Assessment studies (Life Cycle Assessment, Life Cycle Costing, social Life Cycle Assessment, and carbon footprint), critical review and quality assurance for Life Cycle studies, transferring complete LCA data stocks and models from GaBi, Umberto, SimaPro, to openLCA, and from GaBi and Umberto to SimaPro, software development for life cycle analyses to companies which include international enterprises, research and policy institutes, universities, consultancies, industry SMEs and non-governmental organizations in over 15 countries worldwide.

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