



ERASMUS+ PROGRAMME
2018-1-R001-KA203-049458
INNOVATIVE EDUCATIONAL INTEGRATION OF URBAN
PLANNINGS BASED ON BIM-GIS TECHNOLOGIES AND FOCUSED
ON CIRCULAR ECONOMY CHALLENGES



Co-funded by the
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MULTIPLIER EVENT in Poland by Civil Engineering Faculty Warsaw University of Technology

REPORT ON COMPILATION ON LEGISLATION OF LCA AND ITS APPLICATION IN CONSTRUCTION SECTOR IN POLAND



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Mikołajki Gołębiewski, 22nd November 2019



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Introduction to LCA

Life Cycle Assessment (LCA) is a 'collecting and evaluating inputs, outputs and potential environmental influences product system during its life cycle', according to the PN-EN ISO 14044:2009 standard.

The inputs are quantitative and qualitative data on the resources and energy used to carry out the process being analyzed. The effect of this process, i.e. both desirable products, services as well as emissions and waste are the outputs.



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Product system limits

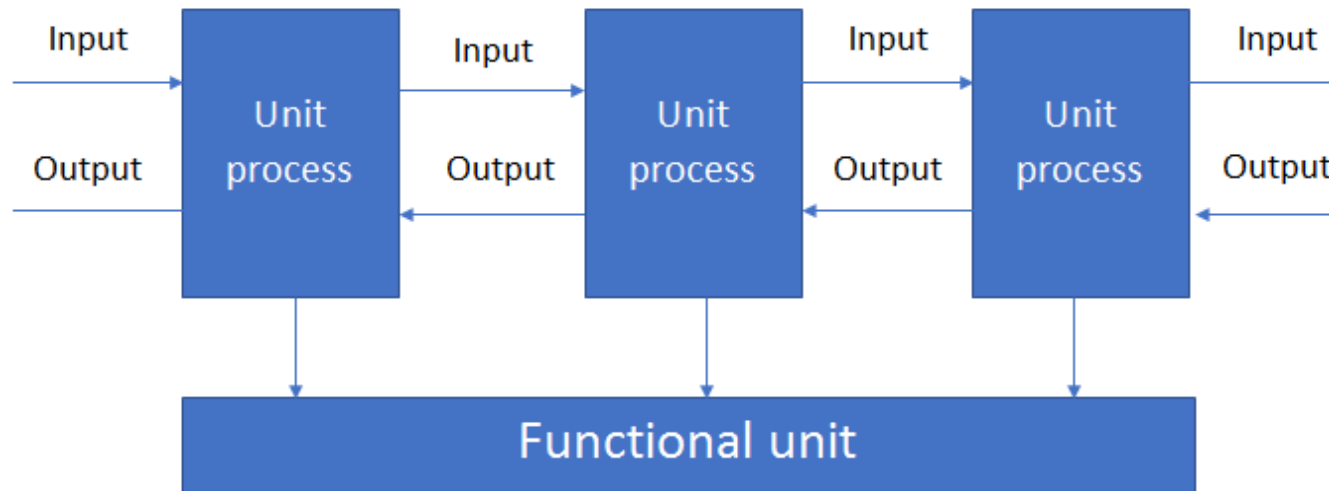


Diagram source: Kulczycka, 2011



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LCA early history

One of the first life cycle assessments, in this case the energy consumption in production systems, was the report presented at the World Energy Conference in 1963. In the following years, in the United States, the REPA (Resource and Environmental Profile Analysis) model was developed, which made it possible to make comparisons of used amounts of materials, energy and waste generated on the basis of their quantitative statement. The proper beginnings of work on LCA are bound to the establishment of a non-governmental association called SETAC (The Society of Environmental Sciences and Chemistry) in 1978.



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LCA subsequent history

In 2004, a branch of SETAC organization was established, operating in the countries of Central and Eastern Europe (SETAC CEE). As of today, its members are mainly representatives of science. The tasks of SETAC CEE are, inter alia, to promote and popularize LCA. The first, widely accepted technical structure (procedure) of LCA was published in 1993 in the document 'A Code of Practice'.

The International Organization for Standardization (ISO) in the mid-1990s started work on the normalization of the LCA area and as a result a group of ISO 1404x standards were created.



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LCA-related Polish standards

- PN-EN ISO 14040: 2009, Environmental management - Life cycle assessment - Principles and structure
- PN-EN ISO 14044: 2009, Environmental management - Life cycle assessment - Requirements and guidelines



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Meaning of the ISO 1404x

PN-EN ISO 14040:2009 and PN-EN ISO 14044:2009 standards describe the principles and structure of the life cycle assessment (LCA) and provide the requirements and procedures that are necessary to assess the whole life cycle of the product.



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Other LCA-related programs

Studies on the life cycle assessment are also carried out under UNEP (The United Nations Environment Program), but the work called the Life Cycle Initiative deserves the most attention, being the result of the work of both SETAC (The Society of Environmental Sciences and Chemistry) and UNEP.



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Environmental declaration and ECO labelling

In Poland there are five international multi-criteria certification schemes:

- BREEAM
- DGNB
- HQE
- LEED
- WELL Building Standard (for now uncommon)



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Conclusions

LCA identifies environmental issues related to products and materials and establishes the benchmark for measurement of improvements. LCA is also more and more commonly used in new product research and development, when the future marketing or cost structure of a new product has to be related to the environment. LCA's growing significance is evident for more and more popular eco-labeling: environmental product declarations (EPDs).

The benefit of LCA: reliable, transparent data for both manufacturers and consumers, enabling better decisions how to produce and use materials and products.



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