

Spread of Innovative Solutions for Sustainable Construction

Handbook

Introduction



Co-funded by the
Erasmus+ Programme
of the European Union

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Most people have very limited knowledge about the environmental impacts and their causes in general and especially related to the construction industry. Hence four international professional organisations teamed up in October 2019 to start the project IS-SusCon funded by the Erasmus + program.

The project outcomes are both online and offline education materials. These shall be easy to use and to understand with the aim to improve the users' background knowledge and environmental awareness. The content includes easy-to-read concept descriptions, practical examples, suggestions and best practices for non-experts. In addition to the present handbook a website (<https://www.oneclicklca.com>) is also available for comparison of the building materials and potential cost-saving solutions.

The coordinator of the project is the LCA Centre (<http://howtobuildgreen.eu/en/webapp-3>). LCA Centre Hungarian Association of Life Cycle Analysts is working in the field of environmental protection with the aim to introduce life cycle analysis and to promote environmentally conscious way of thinking.

ÉMI Non-Profit Llc for Quality Control and Innovation in Building (www.emi.hu) is Hungary's largest complex institute in the construction and building materials industry. Its activities are issuing technical approvals and assessments, testing, inspection, expert reports, research and development, certification and trainings for professionals from blue collar workers to engineers and inspectors.

One Click LCA Ltd (oneclicklca.com), formerly Bionova Ltd., is the developer of the cloud software One Click LCA, which is specializing in construction life-cycle metrics and circular economy. The software is used in projects in 100+ countries and supports 40+ rating/certification systems and standards. Ecoinnovazione is an Italian based consultancy firm, born as a research spin-off of ENEA, offering tailor-made life-cycle based sustainability assessments for private and public entities.

In this handbook we briefly describe the relation of the building and its surroundings (Chapter 1), as well as the materials, structures, and building services systems (Chapter 4 and 6) that contributes to the forming and operating of the house., Moving on from simple conceptions, we summarise in detail why and how our buildings affect their environment and what sustainable construction stands for (Chapter 1). Our book presents the scientific method used to quantify and measure sustainable construction, life cycle assessment (Chapter 2), which makes different materials, structures, buildings, and even settlements comparable. We discuss in separate chapters (Chapter 3) the opportunities to improve sustainability at different stages of a building's life, during design, use, maintenance,

renovation, and demolition, and then, describe such currently-known passive- (Chapter 5) and active solutions (Chapter 6), which are considered good and recommended. In the annexes, we regrouped the descriptions and properties of the most typical building materials and we present some already implemented, good examples from the participating countries.



We would like to emphasize that the issues raised shall be examined in a complex way; there are no absolute solutions. Each solution has its advantages and disadvantages. For example, no matter how perfect a building technology solution may seem in terms of energy savings, if its noise causes difficulties for the neighbourhood's life in case of a densely built-in area. However, in such a case when the nearest neighbours are out of hearing distance or the architectural sound insulation solutions could reduce the noise load to a tolerable degree, this technology may also end up as the right choice, for instance

It is quite difficult to phrase how should we relate to the environment. At first glance, it seems really simple: trying not to harm the environment and to use only as much from the goods provided by nature as it is really needed. But if we think about it again these are more complex queries. What do we understand under wasting and not wasting? If it is clear that it is not sufficient to care about the present and to think about the future, but it is also true on the other way

around: we cannot live without consuming and building anything in the present and just save everything for the future. The challenge is rather to find the right balance: how much can we use now from the natural resources without depriving the present, but also leaving enough for our descendants. Our handbook aims to help in finding this balance and solving the problems outlined above by providing basic information.

The information written in this manual is intended to increase the reader's knowledge. Our target group is the public, young adults visiting housing events and webpages, everybody who is involved in house building or renovation. We recommend that you study and rethink the contents of the book carefully, without taking anything for granted and turn to professionals and specialists for more accurate and specific information. Doubt is the freedom of thought and everyone shall make their own decisions accordingly.