**Case Study: TOOL FOR APPLICATION OF ECODESIGN IN CONSTRUCTION PROJECTS**, developed by HIRILAN

HIRILAN, Arkitektura eta Hirigintza, S.L.P. was born in Bilbao in 2007 as a continuation of Juan Angel Larrañaga Guridi’s architecture office in order to continue offering an integral architecture service focused on every type of clients.

HIRILAN consists of qualified experts in drafting projects and managing construction sites urbanization and rehabilitation, as well as work planning, urban management, and other complementary activities.

**Project team**
- Juan Angel Larrañaga – Hirilan (SME)
- Lidia Ortiz Sagarmina – Hirilan (SME)
- Ana Belen de Isla – LKS Ingenieria (Coach)
- Eugenia Atin – Prospektiker (LCiP Project)
- Olatz Errazkin – Prospektiker (LC Champion)

**Motivation Factors**
The clear conviction of the relevance of both well-executed work – and its quality – and respect for the environment and the responsible use of natural resources in the design and development of projects.

**Simplified LCA and Ecodesign**

**Sector**

<table>
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<th>Timeline</th>
<th>Key Objectives of the Project</th>
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<td>1st October 2015 - 31st March 2016</td>
<td>The main goal of the project was to make the implementation of eco-designing methodology more efficient to allow the experts to apply the LCA procedures into their eco-designing system. Before this project, the calculations were made manually. Through this pilot project the calculations have been automatized by the creation of a tool which incorporates a database with the most common constructing solutions. With the developed tool we also get a better presentation and explanation of the data generating comparative graphs which help the communication to third parties – be it clients, users of the building or society in general – of the environmental improvements.</td>
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The project consisted in the formalization of a software tool which automates the activities resulting from the application of the methodology of HIRILAN’s eco-design system. The greatest impact comes from the internal effectiveness of the company after the automating the application of the eco-design in the projects becoming more efficient and competitive.
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The project consisted of the execution of a software tool which eases the application of HIRILAN’s eco-design system. Basically, these activities focus on the identification of significant environmental aspects and the quantification of the betterments achieved by the measures introduced in each and every significant environmental aspect. With this purpose in mind, a working team was created composed by the management of the company, Juan Ángel Larrañaga, the company’s LCA responsible, Lidia Ortiz, and external assistance, Ana Belén de Isla from LKS. The result is an automated Excel tool which quantifies the improvements of the projects in 3 indicators: consumption of material, embedded energy and carbon footprint.

The main difficulty of the project was the necessity of establishing a reference building which would help quantifying the improvements of eco-designed projects. This building has been crucial to define the construction materials in a number of key chapters, such as structure, walls, roof and interior partitions. Fore every solution the quantity of raw material needed, the embedded energy, carbon footprint and potential recyclability have been calculated. The most laborious part has been the cataloging of constructing solutions and their associated indicators to automate the choice of future solutions.

During the project three meetings have been held to define the needs of the tool, its support, objectives, scope and structure. They worked in groups on the theoretical definition and the Excel based real definition, as well as in the designing of a system which was easy to upgrade and with a database easy to expand. It was crucial that the tool could be updated by HIRILAN without external assistance. After the first beta the tool was verified and validated by using it in a real housing project. As a result of this validation new functions have been added, such as generating graphs.

Environmental Impact
The pilot application of the tool in a real project allowed to quantify a saving of 15,54% in weight of raw material used, between the reference and projected solutions. This lessening in raw materials, conjoined with the election of materials with a smaller carbon footprint has meant the reduction in emissions equivalent to 194.000 CO₂ kilos. A 3,61% of the emissions in this phase of the life cycle.
On the other hand, recyclable materials supposed the 19,06% of the total, which in terms of CO₂ emissions represents 31,17%.
The chapter of the building with greater recyclability potential turned out to be the interior partitions, representing the 14% of the total.
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Description of maturity in LC approaches before the project

Before the pilot project HIRILAN had a mature development of the eco-design system, with a strong involvement from the company’s management and the head of eco-design, but with a methodology which was not agile and based on manual calculus, which made it harder to apply by the experts of the office.

Description of maturity in LC approaches after the project

After the project HIRILAN has an automated tool which allows the technicians without expert knowledge to choose the most adequate materials for each project at its disposal. Now the system is a more efficient one due to the automation of the calculations and obtaining indicators becoming more efficient and competitive.

Maturity and Strategy

Before pilot project

After pilot project

Long term objective
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The inversion required for the development of the tool is clearly lower than the expected increase of productivity and the improvement in competitiveness of the company. By virtue of the LCIP program the company has received a consultancy service without any cost to design and develop the excel tool which allows to socialize the eco-design to every expert and project, choosing quality and environment-friendly solutions.

For HIRILAN the participation in this project means a step forward in a process of constant improvement. The pilot experience has helped to further commit with the LC approach, socializing the knowledge within the entire team and gaining efficiency and competitiveness.

LCIP allowed to make a betterment project referred to in the management plan for the company but for which the company had had neither the needed time nor the required resources.

**Environmental Standpoint**

Systematizing the life cycle approach and the eco-design in HIRILAN’s projects means being able to assimilate this factor in decision-making, designing buildings with functional, technical, aesthetic, and also environmental.

The next activities to be undertaken will be aimed at the implementation of the tool designed to develop future projects in HIRILAN. As the tool gets used the database and the tool itself will improve, incorporating quantifications of other environmental measures taken. It is also intended to extend its use to every expert in the office.

Links and contacts for further information

Juan Ángel Larrañaga Guridi
Lidia Ortiz Sagarminaga
hirilan@hirilan.com
www.hirilan.com

Coach:
Ana Belén de Isla. LKS INGENIERIA
adeisla@lsgroup.com

LCIP Project: Eugenia Atin
(e_atin@prospektiker.es)

LC Champion: Olatz Errazkin
(o.errazkin@prospektiker.es)

LCIP website:
www.lifelcip.eu

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