Mediterranean Building Energy Efficiency Strategy

Pilot Activity 3.2 Task 3

Use of LCA for the qualification of the products offered by local SMEs

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0. INTRODUCTION

The introduction of LCA and LCC criteria in the public procurement procedures in the building sector, if not correctly explained and diffused at local level, could help widening the gap already existing between enterprises from MED area and those from other EU regions, where such evaluations and the use of the associated labels (Ecolabels, EPDs and so on) are already known and applied.

Thus, emerges the need of accompanying the MED enterprises towards the application of these methodologies, encouraging the awareness of SMEs about the opportunity offered by LCA related to the labelling procedures in the building sector and the possibility to be included in national and regional inventories of certified products.

1. OBJECTIVES

The objective of this task is to implement an activity to support the diffusion between regional enterprises of the use of LCA methodologies to qualify their products, defining some starting benchmark and basic criteria for the definition of local “best practices” to take as a reference in financial support actions to local SMEs. The pilot action didn’t have any direct purpose of comparison between different products of the same category or different design solutions of the same product.

2. METHODOLOGY

2.1 Call for interest

A call for interest for SMEs in LCA analysis experimentation was published through Polight database, the innovation pole of Regione Piemonte for green building technologies. All requests for experimentation (9) regarded products and materials for building envelope, confirming that life cycle approach mainly suits for building envelope components ,products and materials than for energy equipment, where the most interesting qualifying issues are strictly related to energy performance and efficiency in the using phase of the product.

Following 4 categories were represented:

- Doors, windows and transparent envelope components (1 window)
- Interior material and components (1 paint)
- Envelope construction components (5 products)
- Insulation materials (2 products)

Product	Category	Proposer	Producer
Isolcannicciato	Vegetable (reed) insulating panel	La Maison Verte	n.a.
Medit wall Panel	Panel for dry building systems	BioH	n.a.
Eco Thermo Paint	Paint	AT Marmo Service	AT Marmo Service
Bio TERM c45 ST	Brick	Vincenzo Pilone	Vincenzo Pilone
Calcinto	Plaster	Vimark	Vimark
Arcoplus 626	Polycarbonate insulating panel	Gallina	Gallina
Cellulose flocks	Insulation material	Nesocell	Nesocell
Planet Neo 62	Aluminium Window profiles	Fresia Alluminio	Fresia Alluminio
Puzzle Roof	Modular roof element	VASS Technologies	VASS Technologies

2.2 Selection of the pilot enterprises

A first comparison between the requests for participation in the experimentation and the existing type 1 and type 3 labels for construction sector was conducted, referring to the main labels identified in the RBA. The aim of this first analysis was to identify already existing product category rules and criteria for the qualification of the selected products and their market distribution through the adoption of a label.

	Windows	Paints	Plasters and mortars	Cellulose flocks	Supporting panels	Insulating panels	Bricks	Roofing systems
European Ecolabel		X						
International EPD system[1]	X	X	X	X	X	X	X	X
BRE Environmental profiles	X			X	X	X	X	X
IBU [2]			X				X	
INIES	X	X	X	X	X	X	X	X
DAPc [3]								
ESIT [4]	X	X	X	X	X	X	X	X

Applicability of existing criteria and product category rules for environmental labelling of construction products

After a first preliminary audit consisting in an eligibility evaluation, a template was developed to collect information about the processes and products of SMEs and select 5 companies.

Informations contained in the templates were used for the second step of analysis, aimed to identify the most interesting products in relation to the experimentation activities, including the LCA analysis and the eco-profile definition of the material.

A multicriteria analysis was conducted, considering the following criteria:

- Position of the proposer respect to the product: distributors of products were not considered eligible, because just a producer can benefit from LCA analysis and eventual use of the label

[1] www.environdec.com
[2] Some of the product category rules have already been updated according to EN 15804 standard
[3] Product category rules are only visible to enterprises adhering to DAPc system
[4] Product category rules have already been updated according to EN 15804 standard

- Product and process description: products were classified on the basis of a first analysis of their life cycle, evaluating the completeness of the description and estimating environmental impacts connected to the kind of materials used and the supply chain process
- The presence of other certified products in the same product category: a benchmark analysis was conducted at a national and European level, through the consultation of the main EPD databases, to identify the competition level in the specific product category
- Sustainability of the product: inputs and outputs of the process were evaluated, considering the % of recycled material in the product, the use of materials from the local territory, the energy and water consumption; including the possession of environmental labels

An analysis of existing labelled products in selected categories was then performed, aimed to identify the competition benchmark level for each product category[5].

	Windows	Paints	Plasters and mortars	Cellulose flocks	Supporting panels	Insulating panels	Bricks	Roofing systems
European Ecolabel		496						
International EPD system[6]	1	1						4
BRE Environmental profiles	1						16	7
IBU [7]			52				16	
INIES	3	50	2					13
DAPc [8]								
ESIT [9]								

Number of labelled products for the main existing schemes in the selected categories

[5] Information at 30.6.2013
[6] www.environdec.com
[7] Some of the product category rules have already been updated according to EN 15804 standard
[8] Product category rules are only visible to enterprises adhering to DAPc system
[9] Product category rules have already been updated according to EN 15804 standard

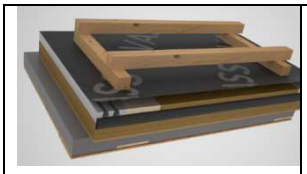
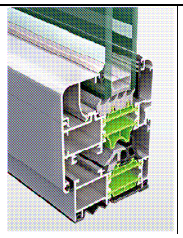
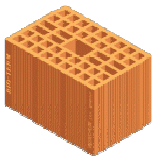
These were the results of the evaluation:

Product	Category	Proposer	Producer	Eligibility	Product life cycle and processes	Benchmark with other certified products	Sustainability of the product	Overall assessment
Isolcanniccio	Vegetable (reed) insulating panel	La Maison Verte	n.a.	NO				
Medit wall Panel	Panel for dry building systems	BioH	n.a.	NO				
Eco Thermo Paint	Paint	AT Marmo Service	AT Marmo Service	YES				
Bio TERM c45 ST	Brick	Vincenzo Pilone	Vincenzo Pilone	YES				
Calcinto	Plaster	Vimark	Vimark	YES				
Arcoplus 626	Polycarbonate insulating panel	Gallina	Gallina	YES				
Cellulose flocks	Insulation material	Nesocell	Nesocell	YES				
Planet Neo 62	Window	Fresia Alluminio	Fresia Alluminio	YES				
Puzzle Roof	Modular roof element	VASS Technologies	VASS Technologies	YES				

	High level requisites
	Standard level requisites
	Low level requisites

Following products were finally selected for LCA analysis:

Product	**Category**	**Producer**
Bio TERM c45 ST	Brick	Vincenzo Pilone
Calcinto	Plaster	Vimark
Nesocell cellulose flocks	Insulation material	Nesocell
Planet Neo 62	Window	Fresia Alluminio
Puzzle Roof	Modular roof element	VASS Technologies

				
Puzzle Roof	Nesocell Cellulose Flocks	Planet Neo 62	Calcinto	Bio TERM c45 ST

2.3 Implementation of LCA and accompaniment of companies

LCA were developed according to the minimum standards for EPD (product category rules for LCA) required by the point 6 of EN 15804, so to be used by proposers for the implementation of an EPD consistent for the assessment of environmental performance of buildings.

The following methodological rules and standards were adopted:

- ISO 14040 and ISO 14044 (LCA application)
- ISO 15804:2012, paragraph 6 and 8.2 (LCA methodology and final report)
- System boundaries: *Cradle to gate* option, as a first step towards a more complete LCA covering more life cycle stages, defining for each product a *declared unit*
- Tool: Gabi 5 Professional
- Database: Ecoinvent (construction sector)

3. RESULTS

All requests for experimentation regarded products and materials for building envelope, confirming that at the moment life cycle approach mainly suits building envelope components, products and materials than energy equipment, where the most interesting qualifying issues are strictly related to energy performance and efficiency in the using phase of the product.

The LCA studies performed gave the companies a useful instrument to different purposes:

- An improved knowledge of the environmental performance of their product and of the impacts related to the specific processes all along the life cycle
- A better communication of their environmental care and of the willingness to evaluate the effective degree of eco-innovation
- The certification of the products according to some of the ISO 14025 (type 3) environmental labels

As a demonstration of the efficacy of the accompanying measures carried on, one of the supported companies (Fresia Alluminio) obtained in March 2014 the EPD according to the international EPD system (http://www.environdec.com/en/Detail/?Epd=9898#.U3t8Ayjm61k), the first at European level in the field of aluminium window frames.

All the 5 Life Cycle Analysis reports were successfully completed, creating the basis for a first regional database of innovative products characterized by a complete characterization of their environmental performance on the life cycle in some of the more significant product categories of products in the local economic context.

The pilot action result also created the premises for a wider application of LCA methodology to the other competitors of the selected companies, in accordance to the increasing of the use of LCA/LCC in the full evaluation of innovation and environmental impacts at European level.

4. CONCLUSIONS

Some general conclusions can be identified:

- The classification of the LCA information into stages (A1, A2, A3) according to ISO 15804, was judged by the companies as a good way of looking to their processes in the inventory activity
- In the cradle to gate option, the impact calculation and representation was mainly focused on the identification of the impacts related to the single raw materials, giving the companies the opportunity to identify the improving potential related to the basic composition of the product and/or to the packaging
- The sensitivity analysis represented an added value of the LCA developed, allowing to identify the relative impact of the single flows of energy/raw materials on the final total impact of the product analysed.

5. ANNEXES

5.1 Preliminary audit templates (D 3.3.1)

5.2 Final audit report (D 3.3.2)

5.2.1 Complete LCA studies (D.3.3.3)

5.2.2 Nesocell LCA report

5.2.3 Fresia Alluminio LCA report

5.2.4 VASS technologies LCA report

5.2.5 Vincenzo Pilone LCA report

5.2.6 Vimark LCA report