1ST OCTOBER 2021

SUSTAINABILITY MEASUREMENT AND MANAGEMENT LABORATORY (SuMM LAB)

BOLOGNA BUSINESS SCHOOL | CENTRE FOR SUSTAINABILITY AND CLIMATE CHANGE

REPORT #3

MARIOLINA LONGO, MATTEO MURA, CHIARA VAGNINI, SARA ZANNI

BOLOGNA BUSINESS SCHOOL, DEPARTMENT OF MANAGEMENT, UNIVERSITY OF BOLOGNA

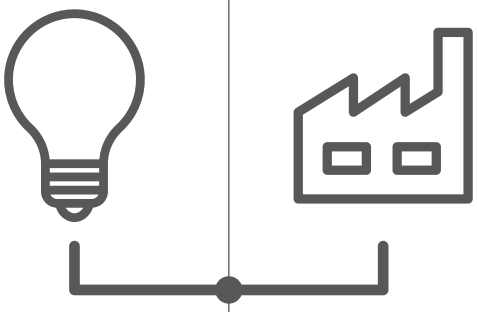
BBS

REPORT 3:
LIFE CYCLE THINKING FOR PRODUCT INNOVATION

Life cycle thinking for product innovation in a nutshell

The most adopted product innovation practices in the Italian industrial context:

- Eco-design
- Life Cycle Assessment
- Dematerialisation
- Report on production techniques
- Energy efficiency in buildings



The most committed industrial sectors to develop Life Cycle Assessment:

- Paper and cardboard
- Rubber
- Maintenance of metal products
- Leather products
- Machines for energy generation and distribution

BBS

INTRODUCTION

The new production paradigm proposed by Circular Economy, where the resources are circulated, implies the maximization of the value of materials along the value chain, extending the life cycle of materials and rethinking their functions based on multiple cycles. This requires a radical modification in the approach to product innovation, integrating considerations regarding environmental impacts of products, processes and services at the early design stage, at the same level of importance as other factors typically guiding the product development. Moreover, it is crucial to account for impacts generated along the whole life cycle of the product, in order to promote circular principles, like reusability or recyclability of parts and materials, through a systemic approach, i.e. moving the focus from the single product/process/service to the system interdependent to it. The Life Cycle Thinking[1] allows sustainability to enter the process of product innovation and offers ground for improving its overall performance. For this reason, practices related to it represent a great opportunity for businesses.

The Sustainability Measurement and Management Laboratory (SuMM Lab), has identified a set of product innovation practices oriented to the delivery of sustainable products/processes/services adopted by small, medium, and large organisations. The current Italian context is analysed in the light of data collected.

[1] https://www.lifecycleinitiative.org/starting-life-cycle-thinking/what-is-life-cycle-thinking/

KEY FINDINGS

Among the 69 KPIs composing the observatory, the following five meaningful metrics represent the development and adoption of product innovation practices in the Italian industrial context:

1. Eco-design processes implemented;
2. Life Cycle Assessment applied to one or more products or process;
3. Dematerialisation strategies applied into product innovation process;
4. Report on production techniques aimed at reducing the environmental impacts of product or process;
5. Development of goods and services addressing the issue of energy efficiency in buildings.

PRODUCT INNOVATION PRACTICES

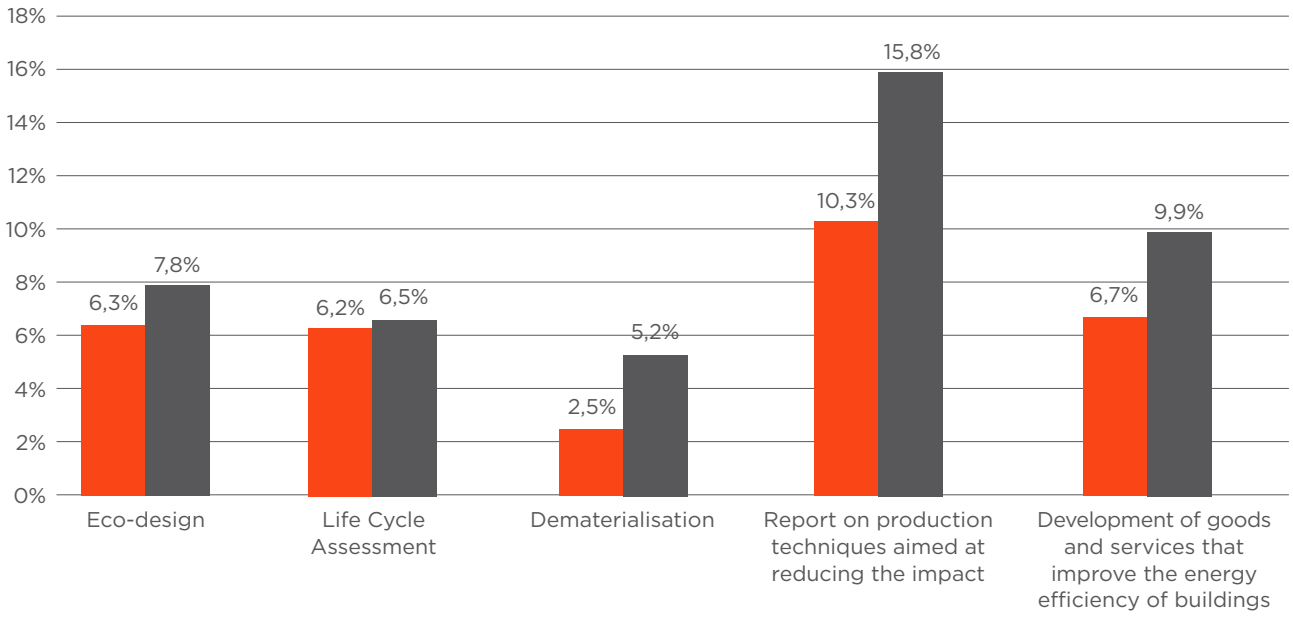


Figure 1. Percentages of companies currently adopting practices related to product innovation in Italy recorded during the two round of data collection (2018 and 2020).

Findings suggest that this group of practices are developed by no more than 15% of the companies within the sample. In particular, the more diffuse practices are related, on the one hand, to the products offered on the market, intrinsically innovative as they are aimed at improving the energy efficiency in the building and construction sector; on the other hand, companies tackling this group of practices appear to be more open to disclose their efforts towards the reduction of environmental impacts through reports. More advanced and complex techniques, such as the application of eco-design techniques in the development of product and processes or rigorous assessment of impacts generated through the LCA, are applied by less than 10% of the companies. Finally, dematerialisation still appears a frontier practice that only a few pioneers are facing.
Considering results from the two rounds of data collection performed in 2018 and 2020, respectively, they show how the reporting activity experienced the most remarkable increase in the last three years, followed by the development of products for the energy efficiency and the dematerialisation, while the practices related to the Life Cycle Thinking, i.e. Eco-design and LCA, remain almost unaltered.

In terms of geographical distribution, we can observe that the adoption of practices oriented to sustainable product innovation considerably varies across Italian regions and presents a quite unexpected distribution. Considering the overall population of companies mapped per each region, smaller reality, such as Molise and Valle d'Aosta, resulted far more committed to this practice, compared to bigger regions. In addition, companies from Central- Southern Italy (i.e. Marche, Abruzzo and Campania) develops more LCA study, compared to companies from the North (Figure 2).

LCA

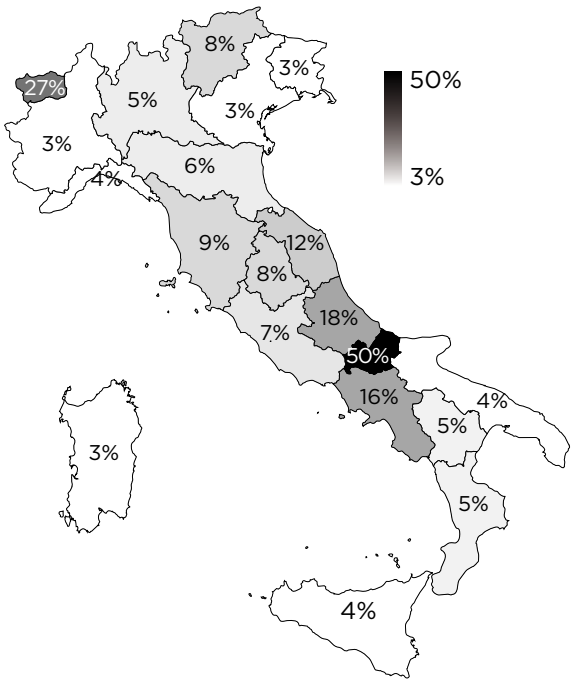


Figure 2. Geographical distribution of LCA among Italian regions.

Finally, we considered the industry groups, which have been proved to behave differently in terms of tendency to disclosure of environmental and social information[2]. Especially when the sustainability-related practices imply high added value activities, like in the case of LCA, their implementation is strongly related to the level of returns they have in terms of market response. LCA is a standardised procedure for the identification and quantification of the impacts generated by a product, process or service along its entire life cycle, i.e. from cradle to grave, or, in a circular perspective, from cradle to cradle. It must be performed based on international guidelines (ISO 14040 and followings) and it can provide valuable insights for the optimisation and improvement of products and process towards impacts.
Specifically, SuMM Lab results show that the most committed industrial sectors to develop LCA are the following (see Figure 3 for more detailed insights):
1. Paper and cardboard
2. Rubber
3. Maintenance of metal products
4. Leather products
5. Machines for energy generation and distribution

As highlighted within the conversation about the general approach towards disclosure, companies that are more committed to apply and communicate LCA belongs to industrial sectors which are either highly pollutant (such as paper – 33%, rubber - 23%, base chemical – 12%, metals – 19% and leather production – 14%) or exposed to the final consumer (such as beverage – 13% and agrifood – 10% industry).

TOP 10 INDUSTRIAL SECTORS

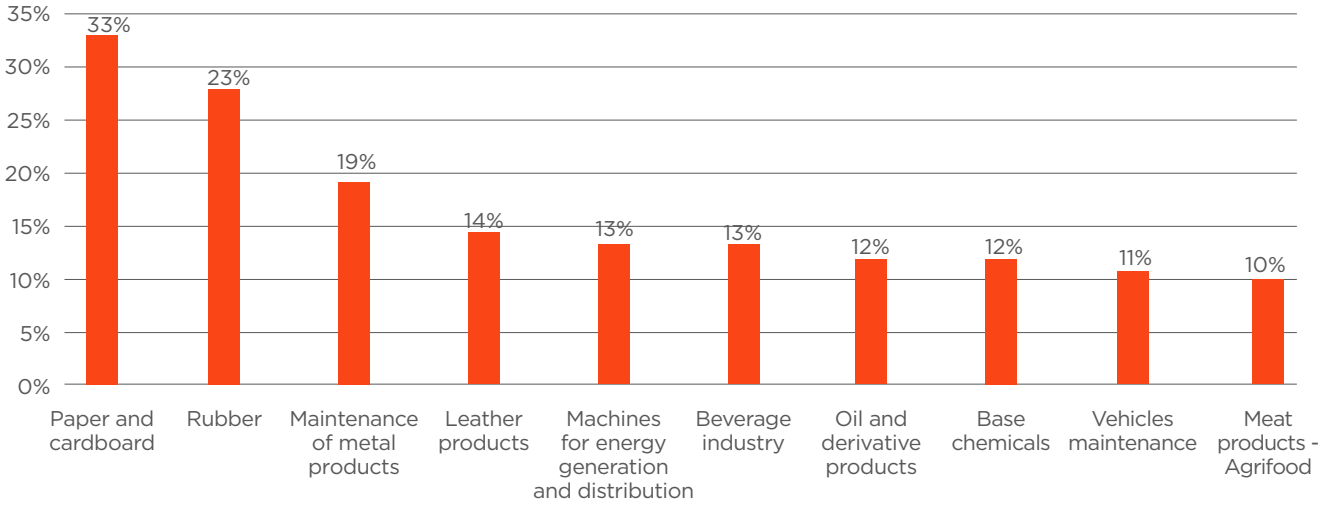


Figure 3. TOP10 sectors in LCA and the percentage of companies within each sector. Industrial sectors are reported based on ATECO classification.

[2] Mura, M., Longo, M., Domingues, A. R., Zanni, S. (2019). "An exploration of content and drivers of online sustainability disclosure: A study of Italian organisations", Sustainability, Vol. 11, No.12.

LCA can be applied both as a managerial tool, on which the company can base the performance assessment of an eco-design process, but also as a communication and marketing tool. When developed in terms of Environmental Product Declaration (EPD)[3], LCA provides comparable information, as the process of modelling and reporting is extremely strict, and third party certified. It a completely voluntary process, and its added value is widely recognised and rewarded with privileged access to specific markets, such as the one unlocked by Green Public Procurement, particularly interesting, considering that purchases by the Public Administration represent about 17% of the Gross Domestic Product (GDP) in Italy and Canada, 18% in Europe, 14% in the USA[4].
As for the paper industry, the Paper Profile[5] remains the preferred platform for sharing information about environmental performance of products at the international level, while other industrial sectors are now converging toward EPD, both at the international (The International EPD System[6]) and national (EPD Italy[7]) level.
The numbers of certifications have doubled in just two years, based on data provided by Eco Platform (association of main European Program Operators, including EPD Italy). In 2018, in fact, EPDs in the building and construction sectors were less than 5,000 and jumped to more than 10,000 in the early 2021[8].

EPD ITALY

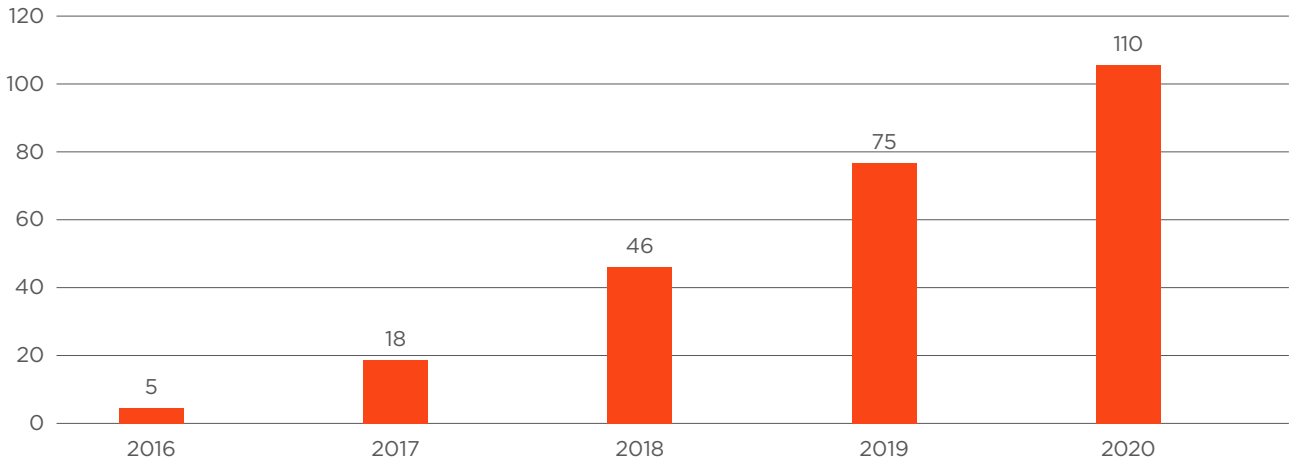


Figure 4. EPD published on EPD Italy platform in the last years (2016-2020). Source EPD Italy[7]

[3] UNI EN ISO 14025: 2010 standard: Environmental labels and declarations-Type III environmental declarations.
[4] UNI EN ISO 14025: 2010 standard: Environmental labels and declarations-Type III environmental declarations
[5] https://www.isprambiente.gov.it/it/attivita/sviluppo-sostenibile/strumenti-per-lo-sviluppo-sostenibile/green-public-procurement-gpp
[6] https://paperprofile.com/
[7] https://www.environdec.com/home
[8] https://www.epditaly.it/

Focusing on the national level, EPD Italy, the national program operator, currently reports 156 products registered[9], for the major part proposed by Italian companies. Companies committed to the application of LCA appears interested in valorising the effort by certifying more than one product of their portfolio, as the average EPD published by each company is 2 and the top player published as much as 18 EPDs.

The TOP 10 companies for number of EPDs published are located mainly in Lombardia (n. 5), Emilia-Romagna (n. 2) and Friuli-Venezia Giulia (n. 2). As average, the TOP 10 companies account for n. 559 employees and 280.000[10] turnover, without any significant modification in the last three years. The impact of rewarding regulation related to GPP (in Italy – Criteri Amientali Minimi) in triggering the companies' commitment toward this particular practice and certification is evident, as the TOP 10 companies belong to industry sectors related to building and constructions, such as ceramics, cement, metal products and building materials in general, with a focus on materials improving the energy efficiency of buildings (like insulating materials and modules).

[9] https://www.epditaly.it/2021/03/25/in-3-anni-quasi-triplicate-le-certificazioni-di-prodotto-sostenibile-epd/
[10] https://www.mite.gov.it/pagina/i-criteri-ambientali-minimi

WHAT TO DO NEXT?

Considering that overall results provided by SuMMLab, sustainability-related practices implemented by Italian companies are still a few, as less than 15% of companies mapped appears to develop sustainability processes at all[11], and practices related to product innovation appears even less common than the average. In the last three years, an increased interest has been registered, with special regard to reporting and certifications, testifying a response towards the regulations in this sense (e.g. GPP[12] and Circular Economy Package[13]). Looking at data proposed by SuMMLab in a longitudinal perspective, in fact, we are able to capture the stimulating effects of the progressive adoption of CAM in Italy, generating a demand-driven committment towards the impact assessment of products, processes and services to improve their environmental performance.

Therefore, we report some suggestions to extend sustainable practices to a wider set of organizations:

At company level:

- Training on management tools, such as Life Cycle Assessment (LCA), to boost the sustainability of new products release, proactively operate on weak points and exploiting the tool in terms of reporting and valorisation on the market.
- Developing integrated design strategies, including multidisciplinary competences.
- Broadening the scope of the design activity, approaching the entire product system and the impacts generated.

At industrial ecosystem level:

- Creating networks to valorise the systemic approach toward product innovation and seize the opportunities generated by it in the perspective of circular economy.
- Sharing success stories and competences, to support the spreading of sustainability-based approaches to product innovation.

At policy level:

- Supporting with adequate incentive systems: Tax credit for financing the development of internal competences in the new tools is just one of the possible examples of incentive system which could support particularly SMEs in the implementation of such practices.

BBS

- Promoting the market opportunities: following the pathway traced with GPP, create marketplaces and privileged access dedicated to products and services developed through the application of certified sustainability-oriented processes.

Following the results obtained on the environmental front, additional efforts must be put in the integration of tools accounting also for the social impacts of products and processes, such as Social Life Cycle Assessment[14] (SLCA) in order to really tackle the triple bottom line of sustainability.

[11] Mura, M., Longo, M., Domingues, A. R., Zanni, S. (2019). "An exploration of content and drivers of online sustainability disclosure: A study of Italian organisations", Sustainability, Vol. 11, No.12.
[12] COM(2008)397 and followings
[13] COM (2014) 398 and followings
[14] https://www.lifecycleinitiative.org/starting-life-cycle-thinking/life-cycle-approaches/social-lca/

BBS CENTRE FOR SUSTAINABILITY AND CLIMATE CHANGE

sustainabilitycentre@bbs.unibo.it
+39 0512090104
www.bbs.unibo.it