Report on needs identification

Deliverable B4.1

Life Effige
Environmental Footprint For Improving and Growing Eco-efficiency

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1. Introduction

As part of the implementation actions pertaining to the LIFE EFFIGE project, the identification of actual and potential needs and barriers faced by firms when conducting lifecycle studies covers a pivotal role in enabling the dissemination of the European Product Environmental Footprint (PEF) among Italian and European firms. To this specific aim, the LIFE EFFIGE project will develop a series of tools to allow small and medium enterprises to uptake PEF studies. More specifically, this activity aims to update the current operational tools proposed by the European Commission and tailor them to the peculiar case of Italian SMEs. In light of this, Scuola Superiore Sant'Anna, the coordinating partner of the project, designed a survey with the important of goal of collecting such evidence to facilitate the diffusion of PEF.

2. Method

A team of two researchers developed a questionnaire in April 2019 by drawing from three main sources: the accrued evidence of the sixteen firms directly involved in the project; academic literature; and technical reports and non-academic literature. At the end of the drafting period, a third researcher checked and evaluated the accuracy of the questionnaire, which was finalized in May 2019.

The final version of the questionnaire contained the following sections:

- Descriptive information
- Product lifecycle assessment studies:
    - Whether and how many studies conducted;
    - Drivers;
    - Obstacles;
    - Incentives;
- Lifecycle management adoption:
    - Current lifecycle practices adoption;
    - Obstacles;
- Organizational performance:
    - Environmental;
    - Financial;
    - Improved organizational performance due to lifecycle management.

We contacted the sectoral partners to coordinate the diffusion of the questionnaire among all the sixteen firms involved in the project, whose characteristics are represented in Table 1.

Table 1. Firms involved in the Life EFFIGE project

Type of firms	**Characteristics**	**No. of firms**
Micro	Employees: 1 - 9; Sales revenue: €50,000 - €1,999,999	4
Small	Employees: 10 - 49; Sales revenue: €2,000,000 - €14,999,999	2
Medium	Employees: 49 - 199; Sales revenue: €15,000,000 - €50,000,000	8
Large	Employees: 200 - 9999; Sales revenue: above €50,000,0000	2
Total		**16**

Subsequently, in order to have a broader sample and gather more evidence, we built an additional dataset composed by medium and large firms based in Italy and operating in the manufacturing sectors[1], altogether representing more than 80% of the Italian productive sectors. Table 2 depicts the characteristics of our sample excluding the firms involved in the LIFE EFFIGE project.

Table 2. Firms not involved in the LIFE EFFIGE project

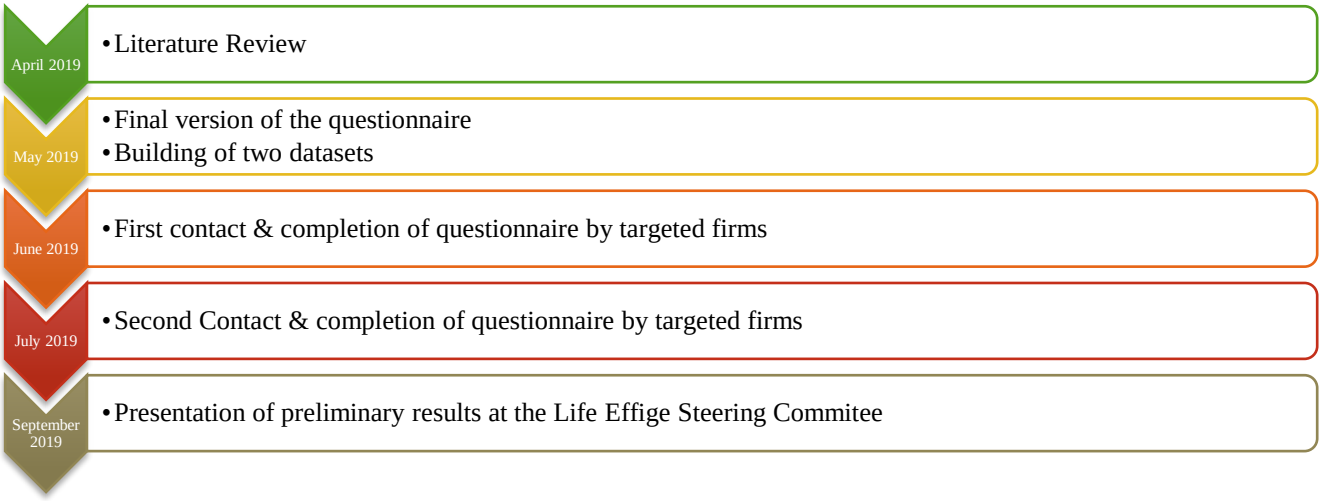
Type of firms	**Characteristics**	**No. of firms**
Medium	Employees: 49 - 199; Sales revenue: between €15 and €50 million	1522
Large	Employees: 200 - 9999; Sales revenue: above €50 million	1447
Total		**2969**

The final sample contained a total of 2985 firms. We then proceeded to retrieve a certified email address for each of the identified firms on the regional websites of the relevant Chambers of Commerce.

In June 2019, we first contacted each firm via email, which contained a link to the questionnaire, administered through Survey Monkey. The first deadline for completion was set in two weeks. The second reminder was sent in July 2019, giving another two-week window to complete our questionnaire. The firms that took part to the survey were 225, representing the 7.5% of our initial sample. In September 2019, the first preliminary results were presented at the Steering Committee of our project to the partners of the project. Figure 1 represents a timeline of the collection procedure.

[1] ATECO Manufacture (10-11-13-14-15-16-17-18-19-20-21-22-23-24-25-26-27-28-29-30-31-32- 33); Construction (41-42-43)

Figure 1. Timeline for data collection



3. Findings Overview

Demographic characteristics

From our findings, it emerged that most of our respondents are medium enterprises (49-250) from North Italy. For more details, Figure 2 shows a pie chart of the size distribution among our respondents and Figure 3 shows where they are located in Italy. Moreover, the great majority of our respondents sell to other businesses or to retailers, as can be seen in Figure 4, where multiple answers where possible.

Figure 2. Size of responding firms

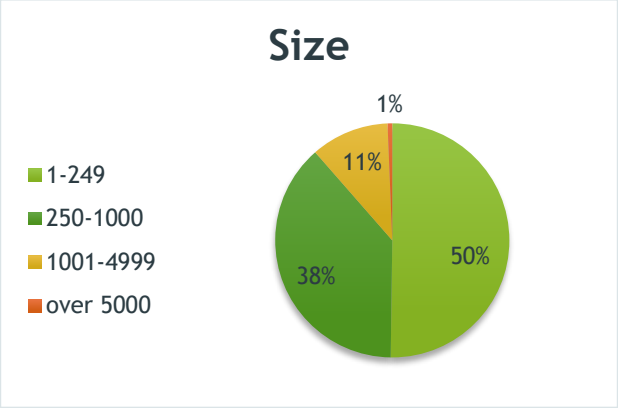


Figure 3. Region of responding firm

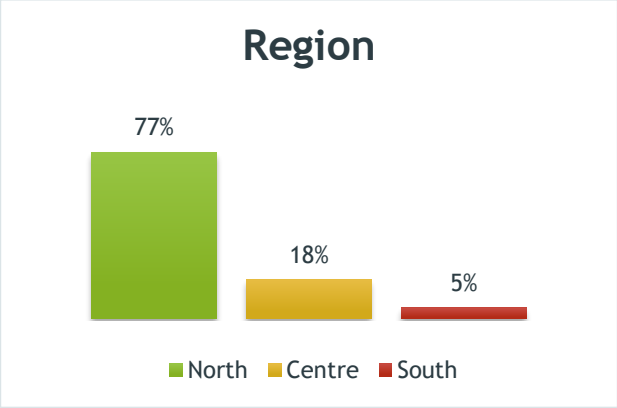


Figure 4. Major clients

Product Lifecycle Assessments

When asked about lifecycle assessment (LCA) studies on their products, only 26% (58) of the responding firms admitted they have conducted LCAs. In particular, among them, 65% of the firms have conducted LCAs on only one of their products; 14% of the firms have done LCAs on at least two products; whereas the 21% of the firms have conducted LCAs on three or more products. Among firms that have conducted LCAs on one or more of their products, 71% firms have done so on existing products; while the remaining 29% has used such studies on new products. This can be seen in Figure 5 and 6. Only 5 firms have then certified their lifecycle studies: 4 firms have obtained the Environmental Product Declaration (https://www.environdec.com/), while 1 firm has computed the Product Carbon Footprint.

Figure 5. Firms that did at least one LCA

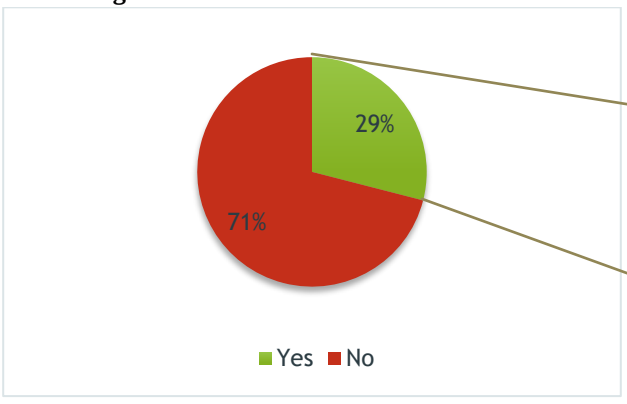
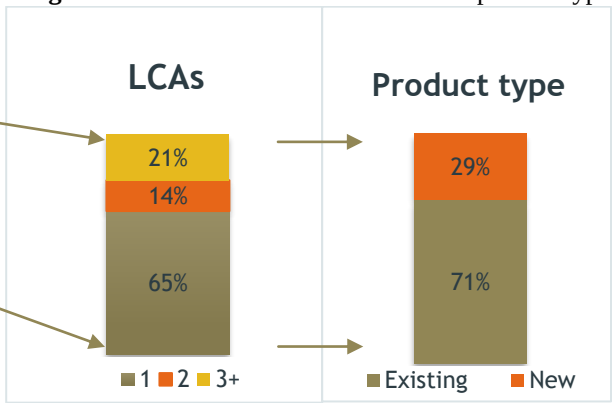
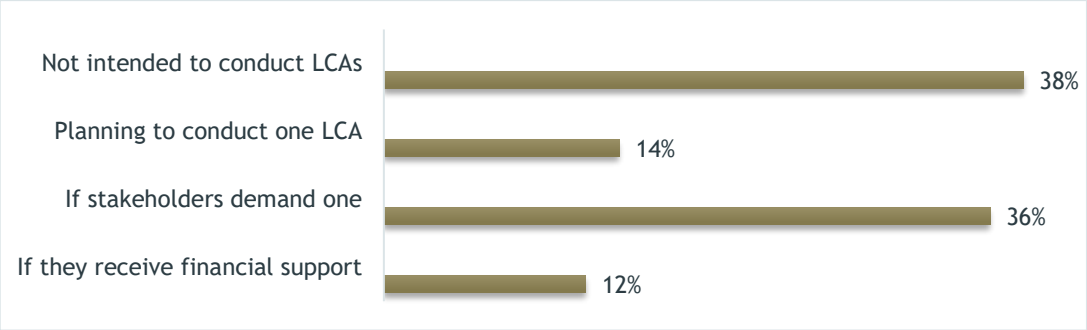


Figure 6. Number of LCAs and on which product type



The majority of the responding firms, 74% (167), have never conducted an LCA on their products. Among them, 38% firms are not intended to conduct an LCA on their products in the short term, while 14% are planning to conduct one on at least one of their products. Another 36% firms declared that will undertake an LCA in the case where other stakeholders will ask for it. Finally, 12% firms would conduct LCAs on their products if they could receive some financial support.

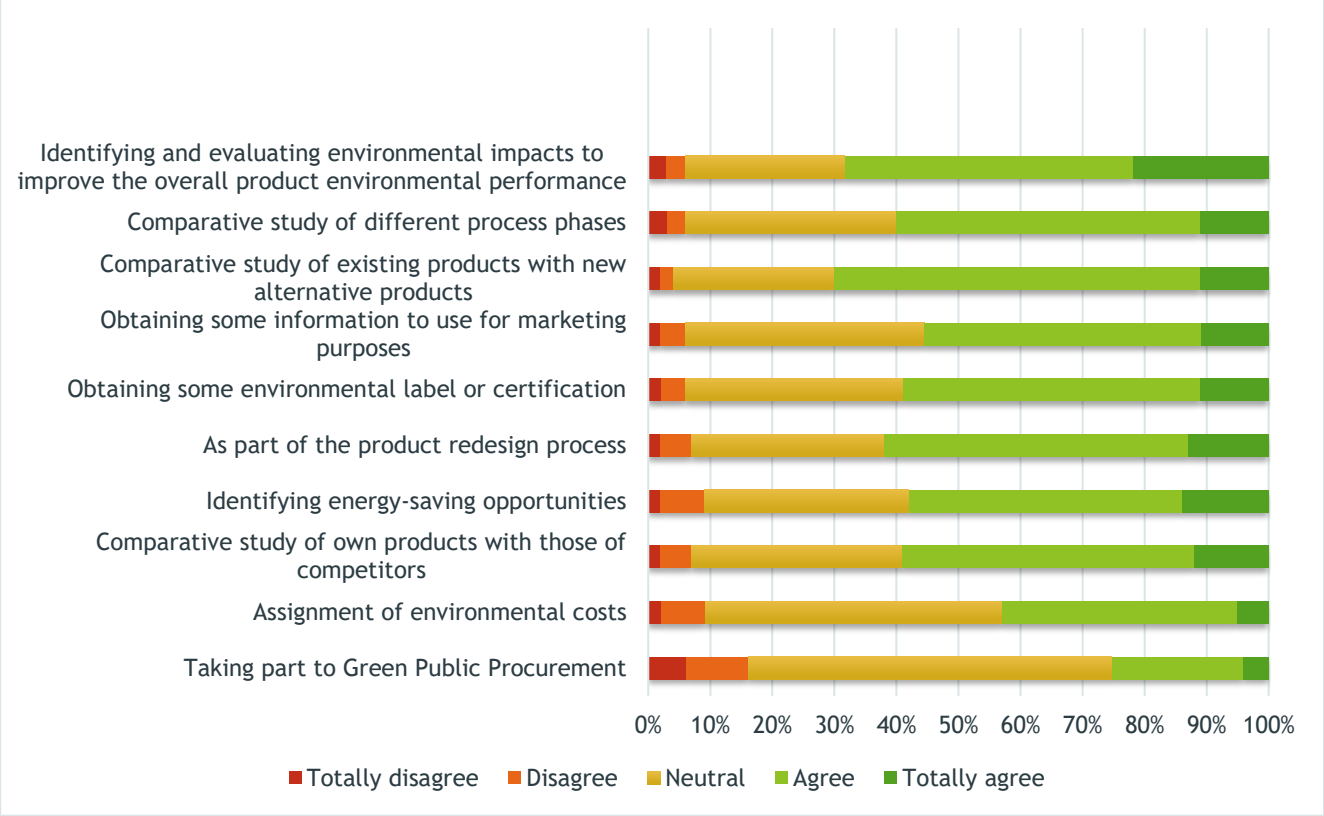
Figure 7. Firms that do not have LCAs



The main motivations to conduct LCAs are directly connected to the design of new or existing products in order to improve their environmental performance, as can be seen in Figure 8. In particular, items with the highest ratings were respectively:

- Identifying and evaluating environmental impacts to improve the overall environmental performance of the product;
- Comparative study of existing products with new alternative products;
- As part of the product redesign process;
- Comparative study of their products with those of the competition.

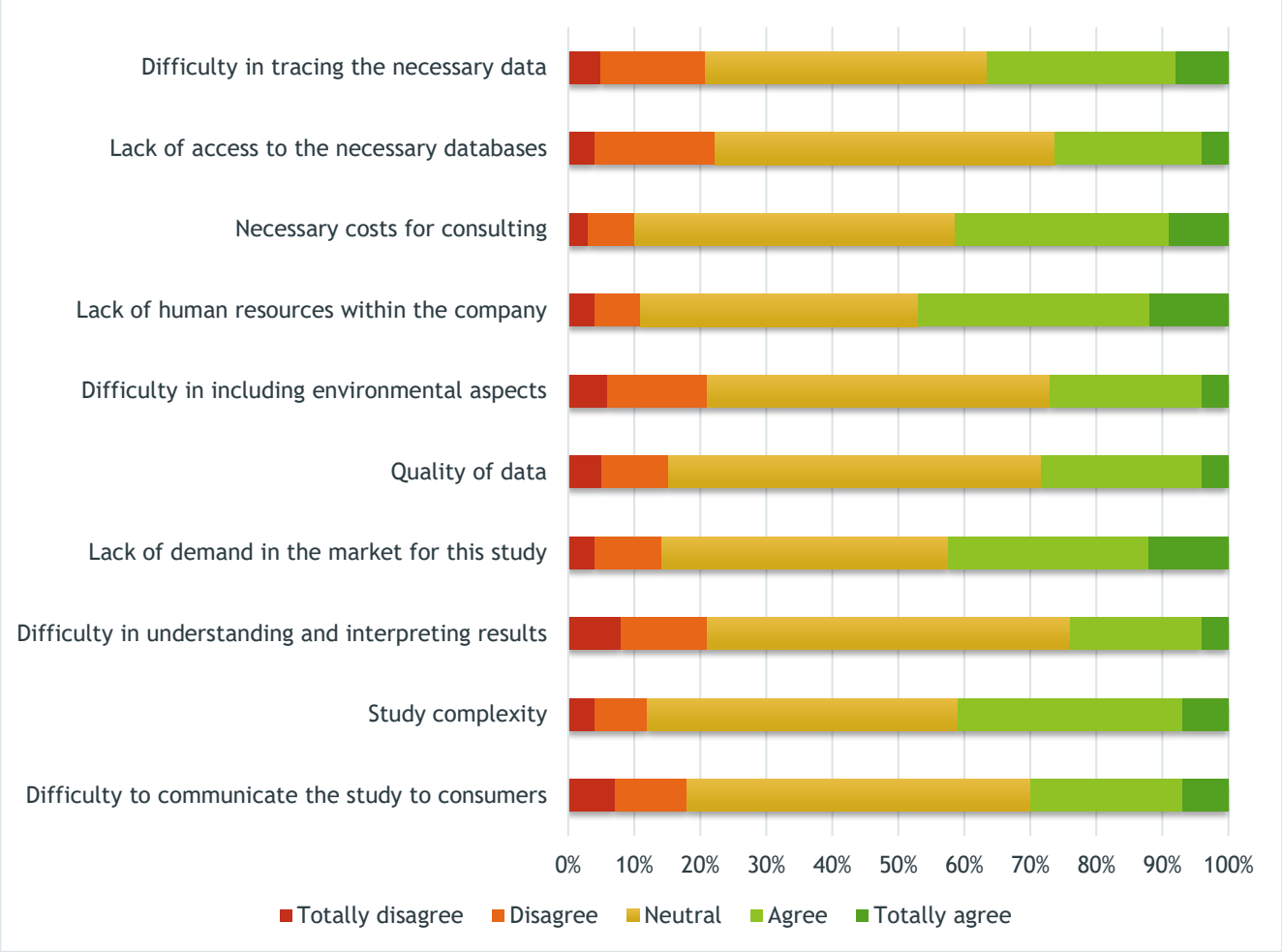
Figure 8. Main motivation to conduct LCAs



From our survey it emerged that firms seemed to be least motivated by the prospect of using LCAs information for the allocation of environmental costs and to comply with the criteria of Green Public Procurement (GPP) to participate in public tenders.

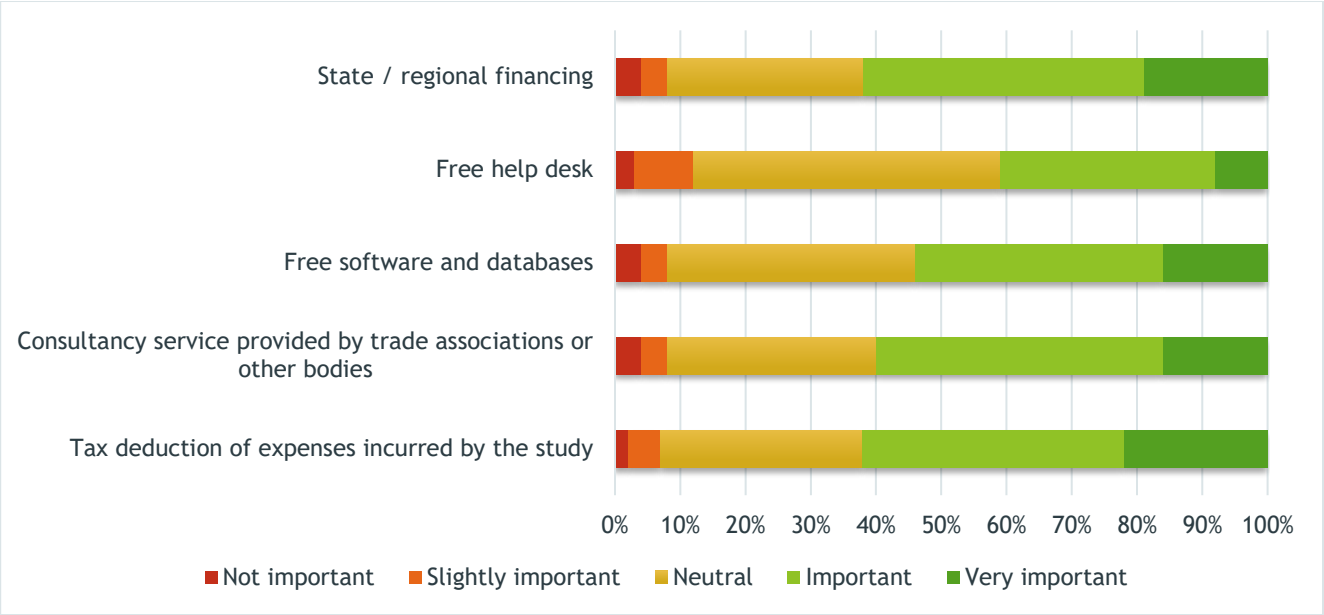
Among key obstacles for the undertaking of LCAs, firms reported the lack of personnel to appoint to this task; the high costs of hiring a team of qualified consultants; the lack of market demand for this kind of studies. Differing from this, the difficulty to understand the output of LCAs, the difficulty of identifying environmental costs, and the lack of access to necessary databases were not highlighted as meaningful obstacles in the decision of conducting an LCA. This is shown in Figure 9.

Figure 9. Main obstacles to conduct LCAs



Finally, when asked about incentives, firms chose economic supports such as cost deduction of undertaking LCAs from taxation and regional or national loans. A free helpdesk was instead not judged as relevant.

Figure 10. Main incentives to conduct LCAs



Takeaways

- Only 3 firms in 10 used LCAs for their new products (design)
- Among the 58 firms which conducted LCAs, only 5 certified their studies.
- 12% firms are intentioned to do LCAs with financial support
- Firms conduct LCAs to identify environmental impacts of their products to improve the environmental performance of their existing products; compare their existing products with alternative ones; redesign them; compare their products with those of competitors. Instead, firms are least motivated to conduct LCAs to assign environmental costs or participate in GPP
- Key obstacles in the decision of conducting LCAs are: lack of personnel, high costs of consultancy, lack of market demand
- Key incentives to conduct LCAs are economic forms of support, such as cost detraction from taxation and regional or national loans

Organizational Lifecycle Management

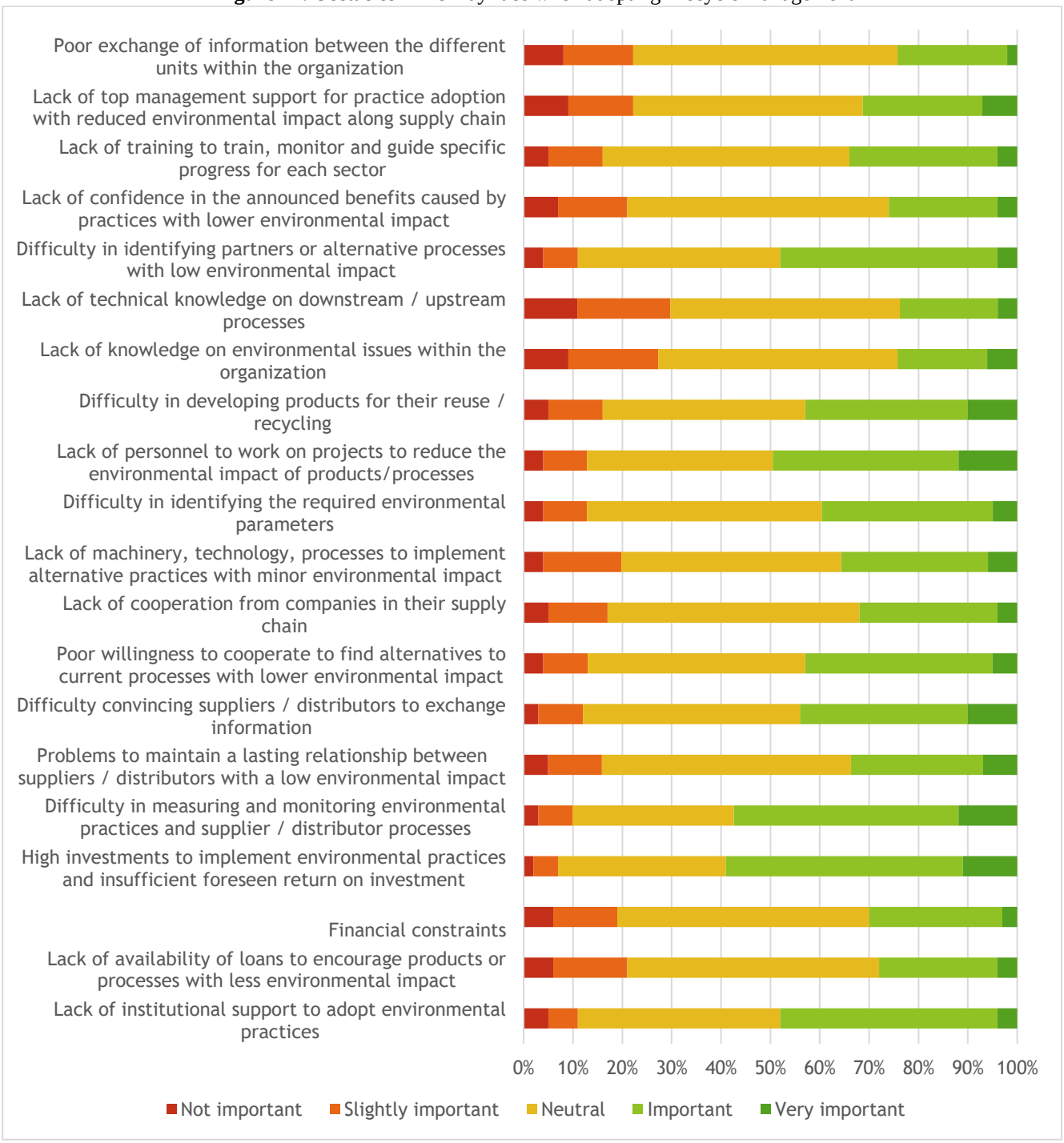
Firms were asked which kind of practices they have in place that adhere to lifecycle management (LCM). LCM makes environmental sustainability operational for organizations that want to improve their performance, by requiring to think holistically, and consider business partners when making operational and strategic decisions.

The majority of responding firms declared they collaborate with their clients when developing new products; they have several means to communicate organizational efforts on environmental issues, such as intranets, internal newsletters, reports, etc.; maximizing the efficiency of materials in the production process; utilizing a closed loop in order to minimize waste; using recycled or biodegradable packaging for their products; and they take into consideration their client interests in their business decisions. In contrast to this, firms consider their supplier interests to a lower extent when making business decisions. Similarly, firms are not considering alternative green means of transportation such as electric vehicles, and they do not use LCA to obtain information in order to choose the most environmentally-friendly product among their alternatives. Such responses can be seen in Figure 11.

Figure 11. Practices adhering to lifecycle management that firms have implemented

Finally, in asking about the obstacles that firms could face in implementing LCM in their organization when making operational and strategic decisions, firms pointed to the high investments required on environmental initiatives as well as the prospect of receiving a low return on investment; complexity in measuring and monitoring suppliers' environmental practices; lack of human resources to employ on environmental projects that aim to reduce environmental impacts of products or processes. Neither the lack of general knowledge nor technical knowledge about environmental issues were chosen as main problems by firms in adopting LCM as shown in Figure 12.

Figure 12. Obstacles firms may face when adopting lifecycle management



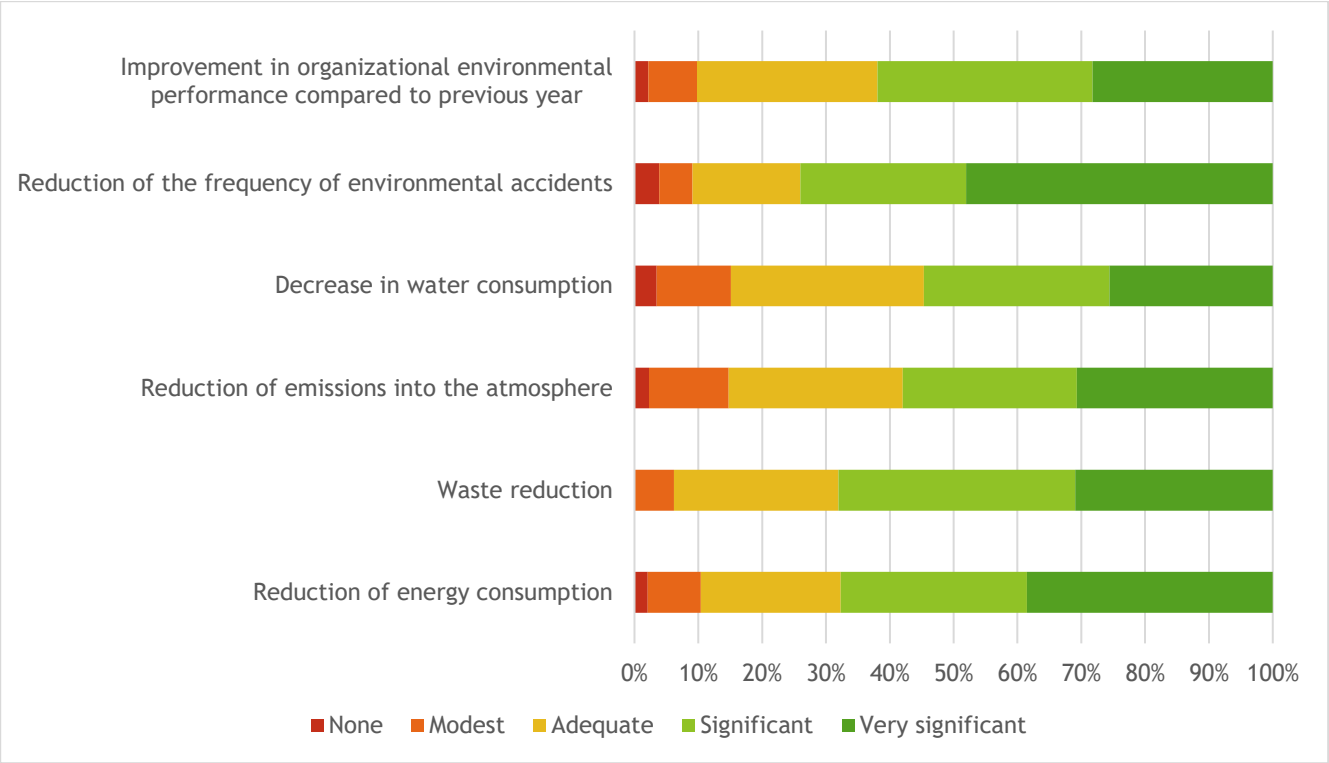
Takeaways

- Firms collaborate with their clients when developing new products and they include their clients interests in their business decisions. On the other hand, they do not consider their suppliers needs when making business decisions
- LCAs are not currently used to discriminate among products for their environmental performance.
- Lack of human resources and high investments are the main problems to implementing lifecycle management

Organizational Performance

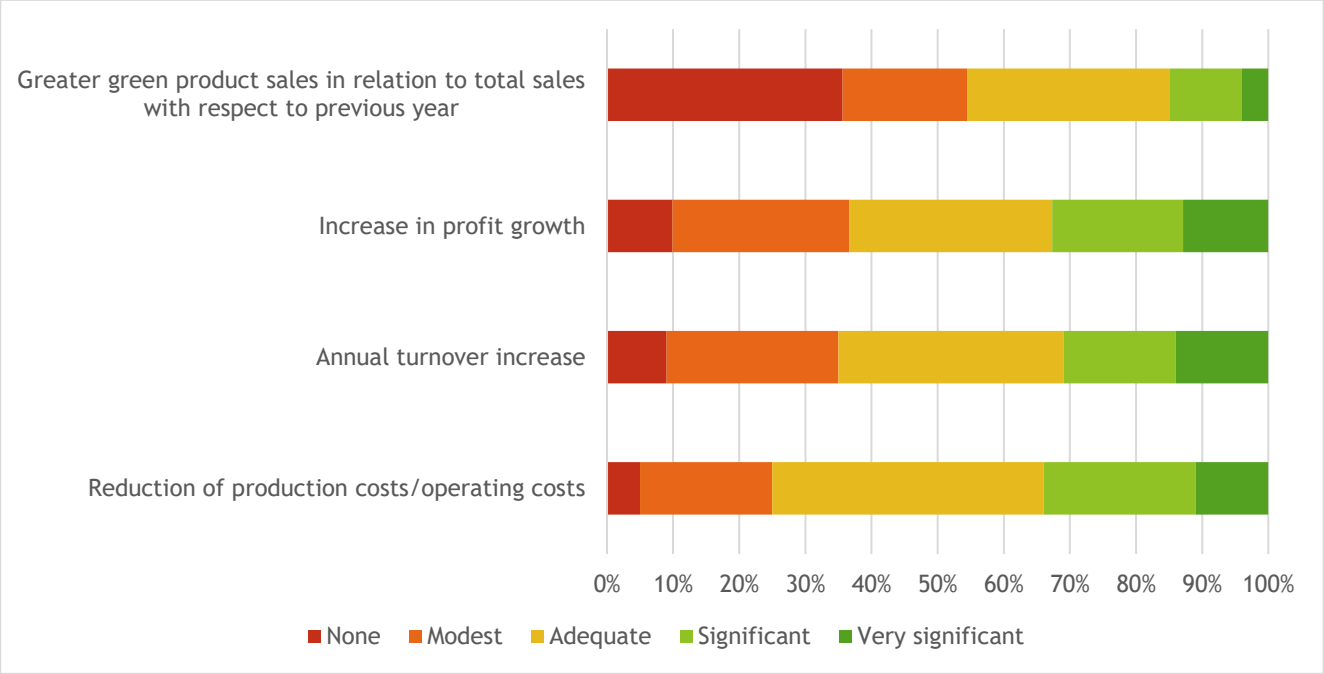
Concerning environmental performance, firms noted that they face fewer environmental accidents alongside their increased environmental efforts, as well as a decrease in waste and energy consumption. This is shown in Figure 13.

Figure 13. Changes in organizational environmental performance since increased environmental efforts



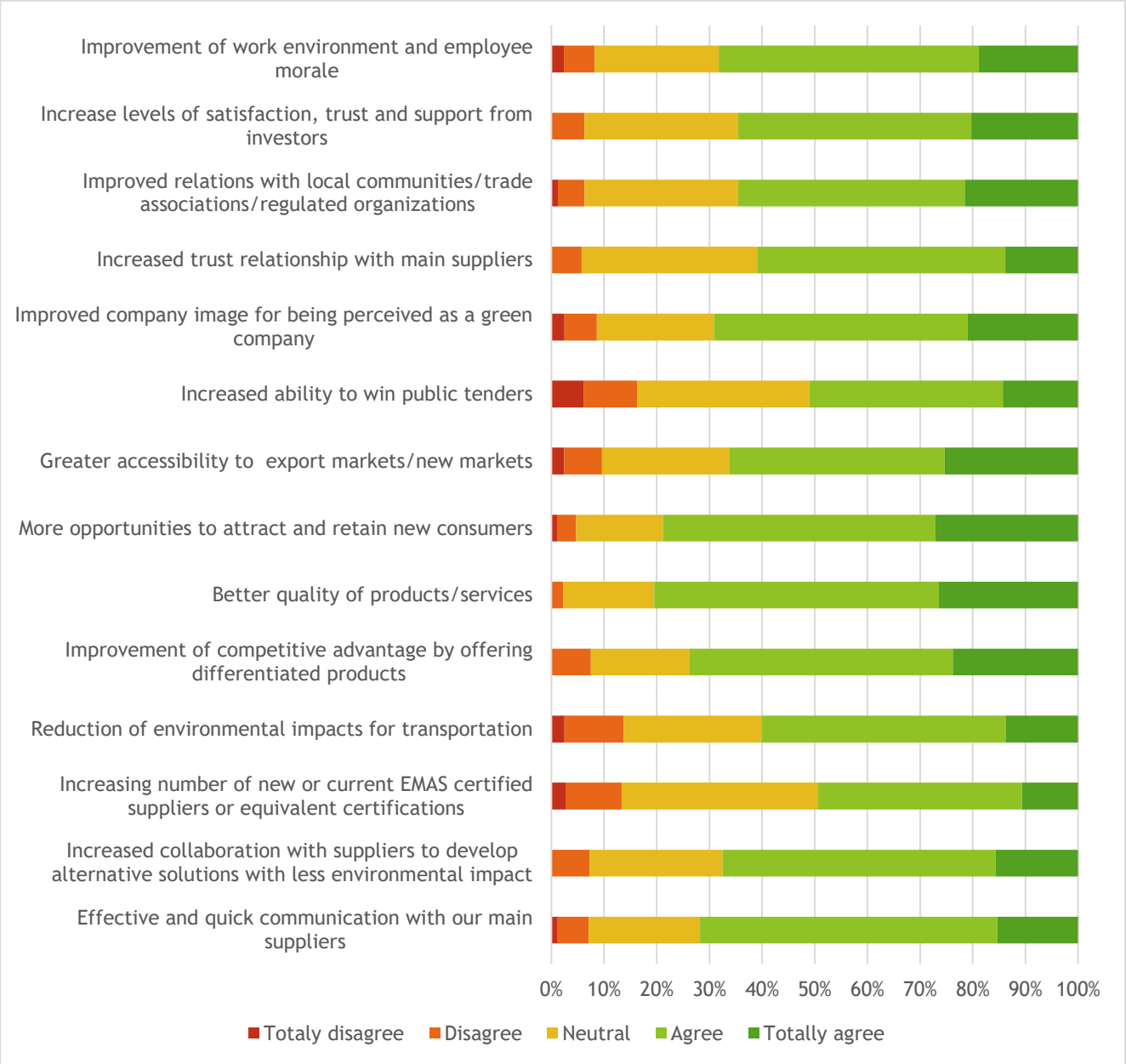
As for their financial performance, they declared an increase in their turnover and decrease in their production costs, as in Figure 14.

Figure 14. Changes in organizational financial performance since increased environmental efforts



Finally, we asked about other perceived changes (Figure 15) that they could attribute to their environmental efforts and they pointed to an increase in the quality of products and related services; an increase in the possibility to attract new clients; a perceived competitive advantage vis-à-vis competitions; and improved communication with their business partners.

Figure 15. Perceived changes in organizational performance since increased environmental efforts



Takeaways

- Changes in performance in relation to increased environmental efforts: fewer environmental accidents; reduced waste and energy consumption
- Firms also reported increased turnover and decreased production costs with increased environmental efforts
- New opportunities emerged: increased quality of products; attraction of new clients; increased communication with business partners

4. Conclusions

The survey conducted by Scuola Superiore Sant'Anna, in coordination with the other partners of the LIFE EFFIGE project, served to identify actual and potential needs and barriers faced by firms when conducting lifecycle studies. In line with Action B4, this aims to update the current operational tools

proposed by the European Commission and promote the dissemination of the European Product Environmental Footprint (PEF) among Italian and European firms.

It emerged that the majority of firms choose to undertake LCAs on their existing products in order to improve their environmental performance, evaluate them against alternative products or competition, and use that information for redesign purposes. Only three firms every ten use LCAs in the design phase of new products. Overall, it appeared that firms are motivated to do LCAs by the prospects of improving their current or new products environmental performance, than by economic incentives, such as GPP. However, lack of personnel, high costs of consultancy, and scarcity of market demand for such studies can act as barriers to the undertaking of LCAs. Whereas, detractions of costs related to conducting LCAs studies and financial supports, despite not being the main drivers, can favor the decision to conduct LCA and alleviate the perceived high costs of doing LCAs.

With respect to LCM, firms already take in consideration their client needs and interests, but fail to do when it comes to their suppliers. Moreover, firms declared that they do not choose their output according to the information of LCAs. In this sense, LCA are not yet in the toolbox when deciding what gets produced. Lack of personnel and high costs are reported to be also barriers to the integration of LCM.

Finally, firms identified several benefits with increased environmental efforts, such as the increase of their turnover and a decrease in production costs, alongside a reduction in energy consumption and waste. Furthermore, they also noted an increased in the quality of products, the attraction of new clients, and the opportunity to communicate more with their business partners.