



Investigating the management challenges of the EU Ecolabel through multi-stakeholder surveys

Luca Marrucci¹ · Fabio Iraldo¹ · Tiberio Daddi¹

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Abstract

Purpose The EU Ecolabel is a voluntary scheme that aims to reduce the overall environmental impact of organisations to boost sustainable consumption in the marketplace and facilitate a transition towards a more circular economy. The main issues connected with the management of this scheme have been rarely investigated in literature. This study aims to analyse the main managerial and technical challenges linked with the EU Ecolabel such as drivers, barriers and benefits, uptake, monitoring, product portfolios and other criteria.

Methods We addressed this literature gap by administering multi-stakeholder surveys including consumers, Licence Holder's and Non-Licence Holder's companies, policy-makers and other main relevant organisations obtaining 442 responses.

Results and discussion The analysis indicated the market drivers and benefits for Licence Holders, but recognised that increasing the marketing promotion of the scheme and boosting its synergies with other EU policies would attract Non-Licence Holders, which also claimed the narrowness of the EU Ecolabel portfolio as the main barrier for its adoption. Our results also confirmed the lack of demand for products bearing the EU Ecolabel, although stakeholders recognised a higher demand for environmentally friendly products. Our results pointed out the lack of a marketing/communication policy coordinated at the European level and the lack of an adequate monitoring system of the performance. Health/well-being products were recommended as main future EU Ecolabel products, while services and business to business products were not advised.

Conclusions Our findings provided new insights on the issues connected with the management of an ecolabelling scheme that can be useful for academics, practitioners and policy-makers. We also provided recommendations for policy makers to develop a heterogeneous (but not too broad) portfolio, with a focus on consumable goods with a health/well-being connotation, to strongly increase the promotion of the EU Ecolabel at all levels and to accelerate harmonisation with other EU policies, especially Green Public Procurement. Future research may investigate the EU Ecolabel awareness by investigating consumers' perception in the EU context or may focus on regulatory reliefs that help to boost the adoption of the EU Ecolabel.

Keywords Ecolabel · Circular economy · Green public procurement · Management · Marketing · Consumption

1 Introduction

Consumers are becoming more conscious about how their behaviours can help facing environmental issues and global change. They have started reducing their environmental impact and changing their patterns of consumption by purchasing more sustainable and low-impact products (Gilg et al. 2005).

The green features of a product have become important drivers in the consumers' purchase decisions.

Aware of this switch in the market demand, companies have begun moving toward a more sustainable production. Nevertheless, companies have to face the problem of correctly communicating their commitment and contributions to environmental safety. It is precisely here, in this lack of information, that product labelling is raised as an important tool. The diffusion of environmental labels has been so successful that the exact opposite problem has arisen: the overcrowding of green labels. In fact, starting from the 1980s with the diffusion of the Blauer Angel, the market has started to be populated by a multitude of labels, brands, symbols or claims promoting the sustainability of products

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✉ Luca Marrucci
luca.marrucci@santannapisa.it

¹ Institute of Management, Sant'Anna School of Advanced Studies, Piazza Martiri della Libertà 33, 56127 Pisa, Italy

(Iraldo et al. 2020). To date, the Ecolabel Index, which is the largest global directory of ecolabels, is currently tracking 457 ecolabels in 199 countries. Moreover, in the last years, a horde of private and self-declared labels have invaded the market, suffocating consumers even more. These labels, which are almost always released without a third-party assessment and certification, largely contribute to the phenomenon of greenwashing. Defined as the superficial and misleading adoption of environmental practices (Laufer 2003), greenwashing is widespread external messaging by an organisation that it cares about the environment to create a positive company image, that often times does not correspond with substantial environmental behaviour (Delmas and Burbano 2011). The abuse of the green labels and the widespread use of greenwashing considerably influences consumers' green purchasing intentions (Nyilasy et al. 2014) and then raises the consumers' scepticism (Rahman et al. 2015).

To face this situation policy makers framed up type I ecolabelling schemes, i.e. "voluntary environmental labels based on a multi-criteria system which analyses the entire product life cycle, subject to external certification by an independent body" (ISO14024 2018). These ecolabelling-schemes, with a greater scientific basis and authority, aim to disclose reliable and detailed information in order to drive consumers' purchasing choices and to boost the most environmentally friendly products.

One of most known public Type I ecolabelling is the EU Ecolabel, established in the 1992 by the European Commission (EC) and revised with the Regulation (EC) 66/2010. The EU Ecolabel scheme promotes products with a reduced environmental impact in comparison to existing products on the market (EC 2010). Nevertheless, its level of diffusion is quite limited. As of March 2020, only 1456 licences were awarded for 70,692 products (goods and services).

This scarce diffusion is also reflected in terms of attention from the academic world. As highlighted by Prieto-Sandoval et al. (2020), there are still room for improvement in the study of the ecolabelling schemes, especially on the EU Ecolabel. The academic literature mainly focused on drivers, barriers and benefits of the adoption of an ecolabelling scheme (Karl and Orwat 1999; Lavallée and Plouffe 2004) and of the EU Ecolabel itself (Iraldo and Barberio 2017). Several studies investigated the adoption of the EU Ecolabel in relation to specific product criteria like furniture (Donatello et al. 2020) or tourism accommodations (Preziosi et al. 2019) providing a very technical contribution on the debate of the efforts needed by an organisation in order to satisfy the standards. Moreover, scholars also strongly investigated the relationship between ecolabelling schemes and consumers' behaviours (Thøgersen et al. 2010; Lin et al. 2017). Nevertheless, the academic debate rarely focused on

the point of view of the management of the scheme. To address this research gap, we administered a multi-stakeholder survey aimed at collecting information on the main issues related to the management of an ecolabelling scheme. Indeed, this study aimed at investigating the best strategies to face the main challenges arising from the management of an ecolabel in order to identify the best elements on which to base the revision of the EU Ecolabel. To further contribute to the academic debate, we specifically focused on licence holder (LH) and the non-licence holder (NLH) companies investigating the drivers, barriers and benefits of the EU Ecolabel.

The paper is structured as follows. First, in Sects. 1 and 2, we briefly review the literature on ecolabelling schemes, and we present our research questions. In Sect. 3, we then explain the methodology adopted to administrate the survey, and in Sect. 4 we show its results. We then discuss the main findings that emerged from our study by critically analysing them in relation to other main academic contributions. Lastly, the paper concludes with remarks on the contributions of the study and its limitations.

2 Literature review and research questions

Both academics and practitioners have focused on the ability of environmental labels to influence and guide consumers' purchasing choices and consumption towards more sustainable products. The academic literature is rich of studies that address these issues from different points of view and with different methodologies.

Schumacher (2010) claimed the ecolabel as a help for product differentiation and for reducing informational asymmetries by providing reliable information to consumers. The author showed that a consumer with a strong green attitude is concerned and demands more ecolabelled products. The demand for ecolabelled products grew strongly with consumer consciousness, while, at the same time, ecolabel-oriented consumers feel more informed. These relationships have also been studied by Cerri et al. (2018). The authors recognised that attitudes towards green products were the main predictors of green purchasing and were influenced by consumer's perceptions of Ecolabel. Even Mufidah et al. (2018) revealed that attitude is the key factor to determine the behavioural intention underling an increased citizens' awareness and that using ecolabels may foster a more environmentally friendly production. D'Souza et al. (2019) proved the effectiveness of ecolabels influencing consumers' intention to purchase green products and showed how ecolabel can provide information fundamental for the consumers' decision choice process.

Several studies investigated consumers' behaviours in relation to the adoption of specific ecolabels in specific sectors. Hallstein and Villas-Boas (2013), focusing on a

self-reported label for sustainable seafood used in a US regional supermarket, estimated the effects on the label on overall seafood sales. Merli et al. (2019) explored how guests perceive “green hotel” practices and tested the relationship between guest perceptions and behavioural intentions. Still in tourism accommodations, but in the Portuguese context, Preziosi et al. (2019) investigated whether green practices implemented by EU Ecolabel certified hotels contributed significantly to the formation of positive guest behavioural intentions. Focusing on ecolabelled forest products, Thompson et al. (2010) tested whether a relationship exists between demographic/psychographic characteristics and reported environmentally conscious intentions providing a “green” segmentation of consumers. In fact, grouping green consumers into an effective profile enables marketers to segment and target these groups based on a clear understanding of consumer behaviour (D’Souza 2004).

Even though ecolabels have emerged as one of the main tools of green marketing (Rex and Baumann 2007), their profusion may generate consumers’ confusion (Brécard 2014). The debate over the use and abuse of environmental labels has been faced by scholars for a long time (Salzman 1997), and the situation seems to have gotten worse. “More and more firms are engaging in greenwashing, misleading consumers about their environmental performance or the environmental benefits of a product or service” (Delmas and Burbano 2011). The effects of greenwashing have been largely studied (Nyilasy et al. 2014; Zhang et al. 2018) recognising a direct negative impact on consumer purchasing intentions.

In this muddled context, the need of trustworthy and reliable ecolabels is extremely important, especially considering the necessity to boost environmentally friendly products in the market. Considering its public nature and its European coverage, EU Ecolabel may be a cornerstone in the fight against greenwashing and against the widespread use of fake ecolabels. However, its influence on the market is still low and several issues have been raised since its last revision.

2.1 The study’s research questions

Only Iraldo and Barberio (2017) focused specifically on the EU Ecolabel through a survey on LH and NLH companies, investigating drivers, barriers and benefits. Both LH and NLH companies indicated market factors as the main drivers, even though “increased consumer satisfaction” and “better management of environmental issues” fall into the group of motivation for applying for the EU Ecolabel. In regard to the benefits of the EU Ecolabel: “market factors and the improvement of the overall environmental performance of the company are the main benefits resulting from being awarded the EU Ecolabel.” Nevertheless, “lack of competitive rewards and advantages,” alongside with “too much documentation

required” and “lack of external incentives,” were indicated as the main barriers by the LHs. Instead, NLHs “although agreeing with LHs when considering the amount of documentation required and the EU Ecolabel’s general lack of recognition and public incentives, they give far greater importance to the criteria requirements of the EU Ecolabel being too stringent and give this as a major barrier.”

Considering that Iraldo and Barberio (2017) performed the only study on this topic, we formulated our first research question aimed at verifying the results obtained by the authors and aimed at expanding the scope of this investigation.

RQ1: Which are the main drivers, barriers and benefits related to the adoption of the EU Ecolabel?

The strength of an ecolabel is to offer producers and retailers a marketing tool for credible communication of environmental performance for the entire market in a harmonised way. When environmental claims and information on the environmental performance are used, and both are understood and demanded by the consumers, the chance for successful marketing based on ecolabels increases. Assessing the market suitability pertains to making an accurate assumption about whether companies are willing to apply in a sufficiently high degree and use and maintain their EU Ecolabel licences. Considering the importance of this aspect, our second RQ is as follows:

RQ2: How big is the market demand for ecolabel products and for EU Ecolabel products?

Linked to market demand, there is the marketing/communication policy adopted by a company to promote their products bearing the EU Ecolabel. Although green marketing is discovering other means than labelling to promote green products (Rex and Baumann 2007), ecolabels are still one of the most widely used strategies. Nevertheless, label proliferation negatively aggravates the effect of consumers’ uncertainty, which therefore affects companies’ efforts (Harbaugh et al. 2011). In order to investigate how companies are facing the issues related to the promotion of ecolabels, we formulated our third RQ:

RQ3: How do companies plan their marketing/communication policy in relation to the adoption of the EU Ecolabel?

As demonstrated by Lozano et al. (2010), although in the short term, “the ecolabel tends to fully replace other uncertified environmental initiatives and increases the proportion of firms implementing voluntary abatement,” in the long term, survival of the ecolabel is not an automatic effect. Indeed, an ecolabel’s survival may also depend on how and when it is launched. In particular, the authors suggested that initial conditions, such as amount and composition of labelled firms, play a key role in determining the ecolabel’s survival. Actions like reduction of certification costs, increase of consumer’s environmental concerns and improvement of the certifier credibility should be done in order to keep an

ecolabel alive. To understand the best strategy to increase the adoption of the EU Ecolabel and to guarantee its survival in the long term, we formulated RQ4.

RQ4: What is the best strategic approach for the EU Ecolabel to increase its adoption?

There is no common opinion on the successfulness of an ecolabel. At the same time, as far as we know, no international ISO Type I ecolabelling scheme has yet established a comprehensive monitoring mechanism to systematically monitor the ecolabel's development and effectiveness. The lack of data accessibility/availability, the lack of an appropriate methodology and the lack of resource constraints for the ecolabelling schemes are the main barriers to the development of an adequate and reliable monitoring system. Considering that most of these data are in the hands of the labelled companies and the other main stakeholders, we formulated RQ5 and RQ6.

RQ5: What does reflect the successfulness of the EU Ecolabel?

RQ6: Which is the best strategy to monitor and measure the successfulness of the EU Ecolabel?

Establishing for which products an ecolabel should be released is probably the main task for the owner of the schemes. Since the EU Ecolabel's inception, this topic has been largely analysed (Loprieno 1997; Nadai 1999) by focusing on the policy implication without defining either a common methodology for the selection or general guidelines. The EU Ecolabel cannot have the ambition to develop and maintain criteria for all products on the EU market; instead, the scheme needs to focus on those products where ecolabelling contributes most to sustainable production and consumption, and where it can expect significant adoption and recognition. In order to identify a list of potential future products/services for the EU Ecolabel, we asked all of the main stakeholders, consumers included, general and specific information regarding the features (RQ7) and the type (RQ8) of the desired ecolabelled products.

RQ7: For what type of products should EU Ecolabel criteria be available in order to maximise its adoption?

RQ8: What kind of products should be covered by the EU Ecolabel in the future?

Mainly, scholars focused equally on the number of labelled products to compare different ecolabelling schemes and on the specific product categories to assess the contribution of the ecolabel on its market performance, but there is no study identifying the most purchased EU Ecolabel products. Thus, with RQ9, we aimed at finding which are the EU Ecolabelled products most purchased by consumers.

RQ9: What kind of products bearing the EU Ecolabel are currently purchased by consumers?

To ensure that ecolabels can be an effective marketing tool (Testa et al. 2015), it is important that product criteria established by the schemes match consumer expectations.

In this way, ecolabels can influence firms' sustainability strategy and stakeholders' behaviours (Darnall and Aragón-Correa 2014). Considering that the EU-Ecolabel is a multi-criteria scheme based on scientific evidence and a life-cycle-based approach, it is fundamental to understand consumers' preferences in order to avoid overly stringent or too widespread requirements for companies. To identify on which specific environmental impacts the EU Ecolabel should focus, we defined RQ10.

RQ10: What are the most important product criteria considered by consumers in their purchasing decisions?

3 Materials and methods

To analyse the factors influencing the adoption of the EU Ecolabel and all the other issues connected with its management, we used data collected by questionnaires administered within the "Identification of elements for a future strategy for the EU Ecolabel" tender that was funded by the EC Directorate-General Environment. The tender aimed at supporting the improvement of the implementation of the EU Ecolabel voluntary scheme on the basis of the Fitness Check (EC 2017) findings and conclusions, which therefore leads to increased adoption.

The survey was implemented in February 2018 in the EU context and aimed at collecting information on the EU Ecolabel adoption and its drawbacks. The data were collected through "EUsurvey," the official online platform for surveys provided by the EC. We conducted a multi-stakeholder survey targeting consumers, LH and NLH companies, retailers, businesses associations, public authorities, academic institutions and NGOs. We included NLHs because companies might be influenced by the EU Ecolabel without asking or applying for it. The EU Ecolabel can stimulate and guide environmentally beneficial product innovations even in those companies that are not adopting it (Rubik et al. 2008). We considered even business associations because they can have an important role in informing their members on the EU Ecolabel and fostering its uptake. Moreover, the retail sector is a key actor in order to successfully stimulate purchase of EU Ecolabelled products. NGOs and academic institutions play a crucial role in raising consumers' awareness on green products and increase knowledge and visibility of the Ecolabel. Lastly, governments and institutions at large are fundamental in communicating and marketing the EU Ecolabel to stakeholders within national borders. While we drafted a specific questionnaire for the consumers (RQ9-10), all the other questions (RQ2-7) were the same for every typology of respondent, with the sole exceptions of the questions related to drivers, barriers and benefits (RQ1),

which were administered exclusively to LHs and NLHs. The question connected to RQ8 was administered to all the respondents. All the questions were based on a 5-point Likert scale format. The questionnaire templates are shown in the [Supplementary material](#).

The access to the online survey was open, so everybody had the possibility to access the website and submit their contribution. In this way, we were able to use the potential of social networks and media channels to boost survey dissemination. We used several channels in parallel to garner opinion from as many stakeholders as possible, raising the expectation of wide-ranging stakeholder feedback from more diverse parties that might otherwise be possible. We engaged businesses, trade associations and NGOs asking them to promote the survey to their members. Finally, all members of the European Ecolabelling Board, especially Competent Bodies, were involved in the dissemination process.

To minimise the common method bias that can affect a questionnaire survey, we used the most diffused procedural remedies such as guaranteed anonymity; avoiding use of ambiguity; vague concepts; complicated syntax and unfamiliar questions; use of simple, specific and concise questions; use of different response formats and use of methodological item separation. Lastly, we deem important to highlight that all the comparisons and the statements made in the paper are valid exclusively for the sample considered in our study and that they cannot be generalised to the whole universe of European States.

4 Results

We collected 442 usable questionnaires, a significantly higher number if compared with previous studies on EU Ecolabel (Iraldo and Barberio 2017). Table 1 shows some details about our sample.

Focusing on consumers' features, most of the respondents are Italian or German, highly educated and have an age between 30 and 65 years. The consumers' sample is equally distributed by both gender and income.

LH and NLH companies mainly belong to the manufacturing sector, and the sample is composed of firms of all sizes, from micro to large.

The survey results provide new and useful information for analysis of the EU Ecolabel. With regard to the research questions presented above, this section presents the main findings.

In Table 2 we present the analysis on drivers, benefits and barriers for LHs and NLHs answering to RQ1. While LHs mainly considered market drivers to adopt the EU Ecolabel, NLHs did not perceive this aspect as a main driver. At the same time, while NLHs gave much importance to the synergies of the EU Ecolabel with the green public procurement (GPP), LHs did not consider the access to GPP as a priority. NLHs also claimed that their willingness to adopt the EU Ecolabel may increase if the promotion of the label and the visibility provided by the retailers would increase. Considering the benefits perceived by the LHs, we noted a substantial coherence with the drivers. Indeed, all the main benefits derived from the adoption of the EU Ecolabel are related to market. On the contrary, NLHs did not take into account the lack of demand for products bearing the EU Ecolabel, but declared that the ineligibility of their products is the main barrier. It is not clear if adopting another ecolabel is a strong barrier. Unclear barriers of adoption and average adoption scores with high standard deviations prevent us from interpreting the results correctly. The rigidity of the EU Ecolabel criteria did not have a role in deterring the adoption. Moreover, NLHs recognised the demand for environmentally-friendly products and their willingness to promote green products. Nevertheless, LHs did not believe that the EU Ecolabel would help to improve the features of their labelled products. In addition, it

Table 1 Distribution of the replies per type of respondents

Type of respondents	No.	Percentage
Academic/Research institution	17	3.85%
Business association	36	8.14%
Company/Business organisation holding one or several EU Ecolabel licence(s)	110	24.89%
Company/Business organisation not holding any EU Ecolabel licence	51	11.54%
Retailer/Wholesaler (holding or not holding an EU Ecolabel licence)	7	1.58%
EU Citizen	143	32.35%
Non-governmental organisation	26	5.88%
Public authority	25	5.66%
Other	27	6.11%
Total	442	100%

Table 2 Mean and standard deviation (SD) for the questions on drivers, benefits and barriers for LHs and NLHs

LHs drivers			LHs benefits			NLHs drivers			NLHs barriers		
Item	Mean	SD	Item	Mean	SD	Item	Mean	SD	Item	Mean	SD
Differentiate from other products in my market segment	3.92	1.32	Possibility to meet consumers' demand for greener / eco-labelled products	4.07	0.99	More priority is given to products bearing the EU Ecolabel in GPP	3.51	1.08	Our products are not eligible for the EU Ecolabel	3.49	1.58
Achieve increase of sales	3.91	1.30	Market differentiation with respect to other products in my market segment"	3.81	1.48	Retailers give more visibility to and sell more EU Eco-label products	3.51	0.97	My company preferred to apply for another ecolabel	3.12	1.49
Respond to consumers' demand for greener / eco-labelled products	3.89	1.24	Possibility to meet business to business demand	3.80	1.33	More EU Ecolabel marketing-promotion by the EC/EU MSs	3.39	1.06	There is a lack of demand for EU Ecolabel products in my market	2.90	1.28
Respond to business to business demand	3.79	1.29	Achieved increased sales and market competitiveness	3.67	1.48	There are more EU Ecolabel products for B2B	3.33	1.09	My company prefers to rely on other tools of environmental management than ecolabels	2.73	1.13
Improve my reputation and relations with stakeholders	3.68	1.29	Possibility to meet to retailers' demand	3.56	1.44	Our products fall in the scope of the EU Ecolabel	3.29	1.30	There is no advantage to use the EU Ecolabel for public procurement in my market segment	2.65	1.20
Support green supply chain management	3.64	1.37	Improved green supply chain management	3.53	1.52	The EU Ecolabel differentiates better from the other ecolabels on the market	3.18	1.07	Retailers are not interested in selling EU Ecolabel products in my market segment	2.61	1.06

Table 2 (continued)

LHs drivers		LHs benefits		NLHs drivers		NLHs barriers		
Item	Mean	SD	Item	Mean	SD	Item	Mean	SD
Respond to retail-ers' demand	3.57	1.42	Improved reputation and relations with stakeholders	3.53	1.52	Less stringent EU Ecolabel criteria	2.90	1.06
Support product innovation	3.33	1.30	Better access to public procurement	3.21	1.53		2.22	1.10
Differentiate in the market from other ecolabel-ling schemes	3.25	1.55	Enhanced prod-uct innovation	3.15	1.52		1.67	0.77
Obtain access to public procure-ment	3.16	1.40	Improved prod-uct design and development	3.13	1.60			
Seize export mar-cket opportunities	3.04	1.49	Market dif-ferentiation with respect to other eco-labels	3.10	1.59			
Improve product design and development	3.01	1.40	Possibility to access foreign markets	3.05	1.69			
						Our products cannot meet the EU Eco-label criteria	2.43	1.10
						There is a lack of demand for products with high environ-mental performance in my market segment	2.22	1.10
						My company does not believe in marketing based on the environ-mental performance of products	1.67	0.77

Table 3 Mean and SD for the questions about the market demand and the marketing/communication policy for the EU Ecolabel administered to LHs, NLHs, and the other sampled organisations

Market demand for ecolabel products and for EU Ecolabel products			Marketing/communication policy in relation to the adoption of the EU Ecolabel		
Item	Mean	SD	Item	Mean	SD
Demand for environmentally friendly products in your sector	3.46	1.22	I would use an ecolabelling logo as a marketing tool for the products I have an EU licence for	4.10	0.96
Demand for eco-labelled products in your sector	3.02	1.27	I would give visibility to EU Ecolabel products in promotional leaflets, on websites and in other communication channels	3.83	1.09
Demand specifically for EU Ecolabel products in your sector	2.45	1.24	I would like to promote the EU Ecolabel products that I am selling even more	3.73	1.10
Visibility of the EU Ecolabel products in your sector	2.28	1.26	I find that products bearing the EU Ecolabel are considered as among the most environmentally friendly products	3.59	1.12
			There is a higher demand for EU Ecolabel products as compared with non-EU Ecolabel products	3.11	1.34
			I consider that only products bearing the EU Ecolabel or another official ecolabel are environmentally friendly	2.75	1.34

seems that EU Ecolabel is recognised limitedly within the EU market, although it does not overlap with other ecolabelling schemes.

The left side of Table 3 shows a high demand for environmentally friend products, but a minor market demand for the eco-labelled ones. The demand dropped lower if we consider only the EU Ecolabel products. Indeed, the results to RQ2 also highlight a very low visibility in the market for the EU Ecolabel products. Nevertheless, at the same time, the respondents claimed that they would use the EU Ecolabel logo as a marketing tool and that they would give visibility to the EU Ecolabelled products (Table 3, right side). On the contrary, the results indicate that there is not a high demand for EU Ecolabel products, but moreover, the products bearing the EU Ecolabel do not

have a competitive advantage in terms of marketing policy if compared with other environmental labels.

In regard to RQ4, continuing to cover a diverse range of products was identified as the best strategy for the future of the EU Ecolabel. In comparison, focusing on fewer, more homogeneous products was identified as the worst strategy. Our results, however, show that it would be strategic for the EU Ecolabel to develop criteria for products that can facilitate synergies with green public procurement (GPP). While, at the same time, it was suggested to avoid overlap with the products already covered by other EU policies such as Energy Label or Ecodesign. The respondents were still uncertain, but with a slight preference, to releasing criteria for business to business (B2B) products and services (Table 4).

Table 4 Mean and SD for the questions about the strategic approach for the EU Ecolabel administered to LHs, NLHs and the other sampled organisations

In order to increase its strategic approach and uptake, the EU Ecolabel...		
Item	Mean	SD
Should continue covering a diverse range of products	3.90	1.11
Should cover more products of interest for public procurers	3.72	1.11
Should cover more business to business products	3.44	1.12
Should cover more categories of services	3.41	1.11
Should focus on consumable goods (e.g. personal care, detergents)	3.38	1.28
Should focus on products with health connotation (e.g. personal care products, paints)	3.29	1.23
Should focus on durable products (e.g. household appliances, office equipment)	3.27	1.28
Should cover products that are also covered by EU Ecodesign requirements	3.26	1.14
Should cover products that are also covered by the EU Energy Label regulation	3.22	1.14
Should focus on fewer and more homogeneous types of products	2.38	1.05

Table 5 Mean and SD for the questions on monitoring and measuring the performance and successfulness of the EU Ecolabel administered to LHs, NLHs, and the other sampled organisations

Monitoring and measuring of the performance of the EU Ecolabel scheme			The successfulness of the EU Ecolabel is reflected by...		
Item	Mean	SD	Item	Mean	SD
Data on production quantity of EU Ecolabel products	3.57	1.11	Private consumers' / economic actors' awareness of the EU Ecolabel	4.15	0.92
Market share of their EU Ecolabel products	3.56	1.13	Use of the EU Ecolabel products as proof of compliance in green public procurement	3.95	1.04
Data on sales of their EU Ecolabel products	3.51	1.15	Market share of EU Ecolabel products within a specific product category	3.82	1.04
Data on turnover of their EU Ecolabel products	3.22	1.22	Indirect environmental benefits (e.g. use of the EU Ecolabel criteria for innovation and technological improvement in a specific sector)	3.76	1.02
			Total number of different EU Ecolabel products available on the EU market	3.66	1.09
			Total number of EU Ecolabel licenses (one license is granted per organisation and per category of product)	3.47	1.08

The results of RQ6 (left side of Table 5) suggest monitoring the EU Ecolabel performance using data on production quantity, on market share and on EU Ecolabel product sales. In comparison, data on turnover did not receive as good feedback as the other opinions. The right side of Table 5, instead, focus on RQ5, i.e. on what reflects the successfulness of the EU Ecolabel. The results move exactly in the opposite direction of what is actually adopted by the EU. In fact, both the total number of EU Ecolabel licences and the number of products, which are currently used to measure EU Ecolabel success, are indicated as the worst options. According to our results “Private consumers’/economic actors’ awareness of the EU Ecolabel” is the main strategy to assess the success of the EU Ecolabel. Nevertheless, as far as we know, there is no study that investigated this topic using a representative and reliable sample within the EU context. Furthermore, our results clearly indicate the need to increase the connection with GPP considering that the use of the EU Ecolabel as proof of compliance in GPP is regarded as an indicator of success.

As show in Table 6, environmental impact improvement, high market demand and high level of synergy with EU policies are the main characteristics that a product should have. A good importance is given to those products that are not yet covered by other ecolabels. Therefore, answering RQ7, environmental and economic aspects are the main drivers that should drive the policy-makers in the selection process of the new EU Ecolabel products. Although a strong linkage with circular economy is required, as demonstrated by Marrucci et al. (2019), EU Ecolabel, as well as other sustainable production and consumption tools, is not fully integrated with the circular economy and limitedly contributes to its promotion.

Table 7, answering RQ8, lists the products that should be covered by the EU Ecolabel in the future according to consumers and other respondents. Consumers clearly highlighted their desire towards the diffusion of the label, giving a positive feedback for practically all the possible future EU Ecolabel products (Table 7, left side). Personal

Table 6 Mean and SD for the questions on typology of products for which EU Ecolabel criteria should be available administered to LHs, NLHs, and the other sampled organisations

For what type of products should EU Ecolabel criteria be available in order to increase its uptake?		
Item	Mean	SD
Products for which the environmental impact improvement is the highest	4.29	0.87
Products with a high market/consumer demand	4.11	0.91
Products showing a high level of synergy with EU policies (e.g. circular economy, EU plastic strategy)	4.05	0.96
Products for which no other ecolabels exist	3.61	1.09
Products for which other ecolabels exist	3.20	1.10

Table 7 Mean and SD for the questions about products that should be covered by the EU Ecolabel in the future that were administered to all the respondents

Products that should be covered by the EU Ecolabel in the future					
Consumers			Other respondents		
Item	Mean	SD	Item	Mean	SD
Baby care products	4.62	0.88	Baby care products	4.12	0.92
Leave on skin care products (e.g. creams, sunscreens, aftershave)	4.61	0.79	Leave on skin care products (e.g. creams, sunscreens, aftershave)	4.09	0.90
Cleansing products and make up removers	4.59	0.80	Toothpaste and oral rinses	4.07	0.89
Toothpaste and oral rinses	4.58	0.76	Cleansing products and make up removers	4.06	0.90
Leave on haircare products	4.53	0.83	Leave on haircare products	4.02	0.91
Make up products	4.52	0.83	Fragrances, perfumes and deodorants	3.99	0.93
Products for household maintenance (e.g. wood oils, waxes and polishes)	4.52	0.85	Make up products	3.96	0.89
Fragrances, perfumes and deodorants	4.52	0.74	Toys	3.94	0.97
Toys	4.44	0.96	Household appliances bearing the EU Energy Label (e.g. washing machines, refrigerators)	3.89	1.02
Toothbrushes	4.41	0.81	Products for household maintenance (e.g. wood oils, waxes & polishes)	3.86	1.02
Laundry services	4.37	0.93	Imaging items and equipment (e.g. printers, cartridges)	3.86	0.94
Imaging items and equipment (e.g. printers, cartridges)	4.37	1.00	Toothbrushes	3.74	1.07
Smartphones	4.31	0.95	Other household appliances (e.g. kettles, irons)	3.73	1.11
Gardens and pet products (e.g. plant care products, pet care products and accessories)	4.31	1.00	Construction products (e.g. doors, windows, other insulation materials)	3.72	1.02
Plastic waste bags	4.30	1.09	Smartphones	3.70	1.20
Construction products (e.g. doors, windows, other insulation materials)	4.27	1.01	Gardens and pet products (e.g. plant care products, pet care products and accessories)	3.63	1.10
Car cleaning services	4.25	1.14	Plastic waste bags	3.63	1.04
Household appliances bearing the EU Energy Label (e.g. washing machines, refrigerators)	4.25	1.17	Green power supply (e.g. electricity)	3.62	1.13
Green power supply (e.g. electricity)	4.22	1.30	Fish and processed fish	3.53	1.14
Audio-visual, photographic and information processing equipment	4.20	1.31	Meat and processed meat	3.51	1.12
Other household appliances (e.g. kettles, irons)	4.18	0.98	Laundry services	3.48	1.09
Solar photovoltaic modules, inverters and systems	4.18	1.28	Other processed food (e.g. pasta, coffee)	3.48	1.06
Vehicles spare parts (e.g. tires)	4.16	1.31	Dairy products	3.43	1.09
Public transport (e.g. bus, train, plane)	4.10	1.11	Solar photovoltaic modules, inverters and systems	3.41	1.19
Small & light vehicles (e.g. bikes)	4.10	1.15	Vehicles spare parts (e.g. tires)	3.34	1.14
Fish and processed fish	4.10	1.27	Public transport (e.g. bus, train, plane)	3.34	1.34
Meat and processed meat	4.08	1.08	Audio-visual, photographic and information processing equipment	3.32	1.35
Dairy products	4.06	1.15	Car cleaning services	3.30	1.34
Construction services (e.g. demolition services, waste management services)	4.05	1.32	Non-alcoholic beverages (e.g. soft drinks)	3.29	1.20
Taxi and delivery services	4.03	1.24	Buildings (e.g. residential and offices)	3.28	1.12
Other processed food (e.g. pasta, coffee)	4.02	1.17	School and nursery services	3.26	1.32
Maintenance and repair services (e.g. heating maintenance, plumber, repair of appliances)	3.99	1.28	Restaurants and cafés	3.25	1.19
Buildings (e.g. residential and offices)	3.99	1.36	Supermarkets and food-retail	3.25	1.18
Car or bike sharing services	3.97	1.22	Construction services (e.g. demolition services, waste management services)	3.25	1.13
Supermarkets and food-retail	3.92	1.36	Alcoholic beverages (e.g. wine, beer)	3.25	1.21
School and nursery services	3.91	1.16	Financial services	3.24	1.15
Restaurants and cafés	3.90	1.20	Car or bike sharing services	3.24	1.22

Table 7 (continued)

Products that should be covered by the EU Ecolabel in the future					
Consumers			Other respondents		
Item	Mean	SD	Item	Mean	SD
Non-alcoholic beverages (e.g. soft drinks)	3.89	1.16	Small & light vehicles (e.g. bikes)	3.23	1.34
Events and meetings	3.79	1.26	Maintenance and repair services (e.g. heating maintenance, plumber, repair of appliances)"	3.17	1.18
Vending machines	3.79	1.29	Vending machines	3.10	1.17
Financial Services	3.78	1.25	Taxi and delivery services	3.07	1.19
Alcoholic beverages (e.g. wine, beer)	3.78	1.24	Events and meetings	3.06	1.34

care and cosmetics products dominate the rank with the addition of “Toys” and products for household maintenance, while even though they receive positive feedback, “alcoholic beverages,” “vending machines,” “events and meetings” and “financial services” are the least suggested products. If we compare the consumers’ standing with the other

respondents’ one (Table 7, right side), we immediately note a very similar distribution of the results. Even though the other respondents ranking, the best and worst-suggested products are extremely similar. In fact, at the top position, we find all the products with a health/well-being connotation. Even in the lowest positions, we find the same products. It is important to highlight that in both rankings, food products and all the services do not receive significant attention, and they are positioned in the lower part of the rankings.

Table 8 Mean and SD for questions on EU Ecolabel products purchased that were administered to consumers

EU Ecolabel products purchased		
Item	Mean	SD
Hand dishwashing detergents	3.85	1.17
Laundry detergents	3.78	1.17
Hard surface cleaning products	3.68	1.28
Detergents for dishwashers	3.57	1.38
Tissue paper	3.43	1.43
Paints and varnishes	3.25	1.50
Copying and graphic paper	3.11	1.53
Textiles	3.10	1.17
Converted paper	3.03	1.56
Rinse-off cosmetic products	2.94	1.50
Mattresses	2.90	1.27
Printed paper	2.90	1.44
Footwear	2.84	1.10
Personal, notebook and tablet computers	2.82	1.17
Tourist accommodation	2.77	1.10
Furniture	2.76	1.18
Absorbent hygiene products	2.66	1.48
Televisions	2.61	1.27
Indoor cleaning services	2.52	1.53
Newsprint paper	2.52	1.46
Growing media, soil improvers and mulch	2.33	1.44
Wood-, cork- and bamboo-based floor coverings	2.27	1.44
Lubricants	2.15	1.31
Hard coverings	2.10	1.32
Industrial and institutional automatic dishwasher detergents	2.00	1.52
Industrial and institutional laundry detergents	1.68	1.24

Table 8 lists the previously covered EU Ecolabel products ranked by whether consumers look for the EU Ecolabel while purchasing them or not. The majority of the products is rarely purchased according to the EU Ecolabel logo. The group of cleaning products and tissue paper occupy the highest positions, while products more related to the B2B market come last. The results of RQ9 show that the EU Ecolabel is best implemented in the business to consumers (B2C) market, and the expected future products move exactly in this direction, therefore confirming the trend and suggesting to increase a move in this direction and not change it.

The EU Ecolabel with the previously-released criteria already covered different products features, but with the emerging circular economy, more aspects should be taken into account (durability, reparability, etc.). Table 9 reports the results of RQ10 related to the criteria observed by consumers during their household’s purchasing decisions. Although our results indicate that consumers consider practically all the identified criteria during their purchasing decisions, avoiding hazardous substances/chemicals and increasing energy efficiency are definitely the most searched ones. Both of the aforementioned criteria are actually included in most of the EU Ecolabel product criteria. In particular, hazardous substances/chemicals are regulated by the article 6(6) of the EU Ecolabel Regulation. Nevertheless, as suggested by Testa et al. (2020), circular attributes of the product weigh on consumers’ purchasing decisions. Our results confirm this trend on consumer expectation, recognising the importance of specifically including durability, but in general, all the circularity features within the EU Ecolabel criteria.

Table 9 Mean and SD of questions on criteria that products must perform well in order to be awarded with the EU Ecolabel that were administered to consumers

Criteria observed for household's purchasing decisions			
Item	Mean	SD	
Avoiding of hazardous substances/chemicals	4.69	0.61	
Energy efficiency	4.62	0.55	
Long life-spans	4.42	0.70	
Environmental impact only during manufacturing and production	4.31	0.86	
Environmental impact all over the life cycle	4.30	0.80	
Easy dismantling and recycling	4.24	0.77	
Easy repairable	4.18	0.74	
Presence of recycled material (e.g. plastics, metals, fibres)	4.17	0.85	
Labour standards during extraction of materials	4.13	0.96	
Labour standards during production and assembly	4.11	0.98	
Noise pollution during use	3.92	1.00	

5 Discussion

The aims of this study were multiple. We analysed the EU Ecolabel from different points of view considering drivers, barriers and benefits of its adoption, but above all, we analysed a series of managerial issues such as monitoring and uptake that can also be found in other ecolabelling schemes. To shed light on the controversial academic and technical debate on these topics, we involved different stakeholders to get a comprehensive picture of the situation. More importantly, we investigated both the product features searched and the attention consumers gave to products bearing the EU Ecolabel during their household purchasing decisions. Lastly, to expand the academic literature and provide useful information to policy makers, other ecolabels and companies, we looked over new possible future products for the EU Ecolabel.

In regard to the possible future products, we compared the results of the consumer surveys with those of other respondents like LHs and NLHs, and we found that both differences and similarities in the perception of the new products by the two groups emerged. Our findings provide new insights on the issues connected with the management of an ecolabelling scheme that can be useful for academic, practitioners and policy-makers.

The findings on drivers, barriers and benefits of the adoption of the EU Ecolabel went beyond the results of Iraldo and Barberio (2017). If on one side, our results confirm the competitiveness and the economic performance as the main LH drivers; on the other side, NLHs declared that only a higher synergy with GPP and a stronger marketing campaign would boost their adoption of the EU Ecolabel. Compared with what was highlighted by Iraldo and Barberio (2017), it seems that NLHs are aware of the market benefits of the EU Ecolabel, but at the same time, are also aware of the lack of adequate promotion both from policy-makers and retailers. Indeed, while LHs

recognised the market benefits derived from the adoption of the EU Ecolabel, the NLHs claimed that the only reason for not adopting the EU Ecolabel is that their products are not eligible for the scheme. It is also important to note that Iraldo and Barberio (2017) indicated as a main ecolabel barrier the stricter requirements, while our results completely reject this hypothesis.

From RQ2 to RQ7, our study investigated a series of managerial and technical issues connected with the development of the schemes. Excepting rare cases (Yenipazarli 2015; Minkov et al. 2020b), scholars have almost never dealt with these managerial issues. Even though the market demand has been strongly investigated, the aspects of marketing and communication policy, which are strictly related to the performance in the market, have not been considered with the same interest in the academic literature. Our results highlight a strong discrepancy between market demand for green product, which is quite high, and market demand for products bearing the EU Ecolabel, which is extremely low. At the same time, the results related to the promotion of the EU Ecolabel underline the willingness to increase the marketing and communication campaign that would then increase the EU Ecolabel role in boosting sustainable consumption. Indeed, as confirmed by Song et al. (2019), ecolabels received little attention and awareness from consumers.

To clearly understand the effect of the EU Ecolabel, it is important to have a monitoring and measurement system able to correctly grasp the successfulness of the scheme. Actually, the EU Ecolabel uses the number of EU Ecolabel licenses and the number of labelled products as key performance indicators. At the international level, ISO Type I ecolabelling schemes use a diverse and non-standardised set of indicators to monitor and evaluate their performance. Nevertheless, none of them evaluates the environmental benefits nor the market penetration of their ecolabelled products. These types of indicators are considered burdensome in terms of resources needed

(time and financial), logistical difficulty and unrealistic feasibility, because data—such as market share, sales, turnover—is not readily accessible to ecolabelling organisations. Indeed, the EU Ecolabel effectiveness in reducing the environmental impact of consumption and production cannot be fully assessed, because of the lack of a commonly agreed upon method to quantify and benchmark the environmental performance of products and the lack of market data for the EU Ecolabel products.

These indicators are also in line with the typology of products suggested by our results. Our findings recommend continuing coverage of a diverse range of products with strong environmental impact and high market demand. Moreover, our results clearly show the importance of increasing the synergies with other EU tools, like GPP and policies such as circular economy. The harmonisation with other EU policies should be encouraged and supported with a common communication strategy for promotion in the market. As suggested by Del Borghi et al. (2020), the development of ecolabels can be stimulated by strengthening the link between GPP and environmental labels. While initially, carbon footprint was hypothesised as a tool to introduce GHG emissions in the EU Ecolabel criteria (Baldo et al. 2009), nowadays, thanks to the introduction of Product Environmental Footprint (PEF), we suggest using this methodology during the development of new criteria, as already underlined by Ojala et al. (2016) and Minkov et al. (2020a). PEF will allow the considerations of not only GHG emissions, but all the significative environmental impacts generated among the life cycle of a product (Marrucci et al., 2020). To strongly increase the interaction with the circular economy, more “circular” criteria such as recyclability and durability may be included within the EU Ecolabel criteria. Our findings recognise the attention given by consumers to these aspects during their household purchasing decisions. Although avoiding the use of chemicals and energy efficiency are the most searched features in a product, including circular criteria like material efficiency, as suggested by Cordella et al. (2020), will help promote the transition towards a more circular economy and facilitate the adoption of life-cycle tools such as PEF. As regard the measurement of the effects of the EU Ecolabel, while data concerning turnover and sold units of LHs may be made mandatory by the EC, the measurement of the environmental impact of the EU Ecolabel products may be assessed through an LCA analysis. Given the limited availability of resources and considering that a complete LCA is expensive in terms of human and financial resources, we would suggest to simplify the LCA study by quantify an approximate difference between the EU Ecolabel product and the relative average market product. Moreover, we would suggest focusing only on the products with the highest environmental

impact and identifying key indicators that may influence the environmental performance of products (e.g. product life-span, use-time). The EC could also apply the PEF methodology, in case PEF category rules exist for the concerned product. By multiplying the resulting difference between ecolabelled and reference products and the number of ecolabelled products, the environmental benefits of ecolabelled products compared with conventional ones can be calculated quite easily.

The low diffusion in the market of the EU Ecolabel is also well represented by the lack of attention paid by consumers to the European label during purchases, as demonstrated by our results. In fact, consumers declare that they look for the EU Ecolabel logo only for the previously-covered products that have a health/well-being connotation, while for the other products, consumers claimed to rarely look for the EU Ecolabel. Health/well-being products were also recommended by both consumers and other stakeholders as main future EU Ecolabel products, thus indicating a clear preference for these kinds of products. Most of the recommended products are attributable to the B2C market, while all the B2B products received negative feedback, especially from consumers. Lastly, while consumers seem to want an ecolabel for services, even if only for few services such as laundry and car cleaning, other stakeholders did not recommend neither these services nor other kinds of services as possible future EU Ecolabel categories. Our results provide useful insights, so far missing in the academic literature, with rare exceptions like Folkvord et al. (2020), that can help both companies and policy-makers in defining which products should obtain or release an ecolabel.

6 Conclusions

This study contributes to the debate on the adoption of the EU Ecolabel and on its limited adoption. By surveying different stakeholders, from consumers, through LHs and NLHs, up to public authorities, this study approached the EU Ecolabel from different points of view considering several managerial and technical issues connected with its development. Even though limited to the sample, we can draft some main recommendations. Indeed, even though our results are more similar to a qualitative study rather than a quantitative, they can be the basis for a deeper and wider analysis on the whole EU Ecolabel universe.

Our analysis confirms the market drivers and benefits already identified by Iraldo and Barberio (2017) but recognises that increasing the marketing promotion of the scheme and boosting its synergies with other EU policies would attract NLHs, which also claimed the narrowness of the EU Ecolabel portfolio as the main barrier for its adoption.

Our results also confirm the lack of demand for products bearing the EU Ecolabel, although respondents recognised a higher demand for environmentally friendly products. Our results point out the lack of a marketing/communication policy coordinated at the European level, which is only one of the issues related to the management of the EU Ecolabel. In Member States with weak national ecolabels, the EU Ecolabel should adopt a more proactive and comprehensive communication strategy to act as the main label for selected product groups. At the same time, competition with strong national ecolabels for well-established product groups should be avoided. Similarly, our study faces the problem of monitoring and measuring the performance of the EU Ecolabel. The results indicate that EU Ecolabel successfulness is reflected mainly by consumers' awareness, while data on sales and market share are the best strategy to assess the performance of the label.

In regard to the products, our study indicated that the EU Ecolabel should continue covering a diverse range of products, especially those with high environmental impact and market demand. In particular, within the previously covered products, consumers declared that they search for the EU Ecolabel for products with a health/well-being connotation. This feature is also the main characteristic of the most suggested products for future development from both consumers and other stakeholders. Although the avoiding of chemicals and energy efficiency, which are already included within the EU Ecolabel criteria, consumers also take into account all the main circular criteria of a product. EU Ecolabel Competent Bodies should identify a systematic methodology for the selection and the discontinuation of the EU Ecolabel products. This methodology may take into account the environmental impact of the products and the potential for improvements, the market suitability and the consumer demand and the relevance in terms of circular economy.

Our study highlights three main issues connected to the EU Ecolabel: optimise market adoption, manage the EU Ecolabel and fill policy gaps. In order to address these issues, the results suggested focussing the efforts on three main pillars:

- Develop a heterogeneous, but not too broad, portfolio with a focus on consumable goods that have a health/well-being connotation;
- Strongly increase the promotion of the EU Ecolabel at all levels, especially in Member States with currently weak national ecolabels;
- Accelerate harmonisation with other EU policies and develop a common communication strategy for promotion.

It is important to highlight that all three pillars mentioned above must be pursued together for an effective strategy to ensure the evolution of the EU Ecolabel. The EU could

create synergies between the EU Ecolabel and other EU policies: using LCA/PEF to include more “circular criteria” such as recyclability and durability within the PG criteria, including specific GPP criteria for the purchase of products bearing the EU Ecolabel (Testa et al. 2012) and avoid overlapping efforts with Ecodesign and Energy Label by covering the same products. Harmonisation with other EU policies should be encouraged and supported with a common communication strategy for promotion in the market.

This study provided useful insights for scholars, practitioners and policy-makers because only through a coordinated approach can the EU Ecolabel aspire to pursue its true goal: to reduce the overall environmental impact by boosting green products and services (Lavallée and Plouffe 2004). Moreover, the main limitations of this study, i.e. the narrowness of our sample and the lack of analysis on consumers' awareness, are exactly the main topics on which future research should focus. Scholars should investigate the EU Ecolabel awareness by investigating consumer perception in the EU context. Other research may focus on regulatory reliefs that help to boost the adoption of the EU Ecolabel within companies, as was done by Daddi et al. (2014) for environmental management systems. Such researches would help identify the EU Ecolabel target audience and draw recommendations for the future strategies of the scheme, in order to better meet the needs of consumers and companies and to design more effective measures for a greater diffusion of the EU Ecolabel.

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