Sustainability and Beyond

PROCEEDINGS

of the 31st Annual Conference of the International Sustainable Development Research Society

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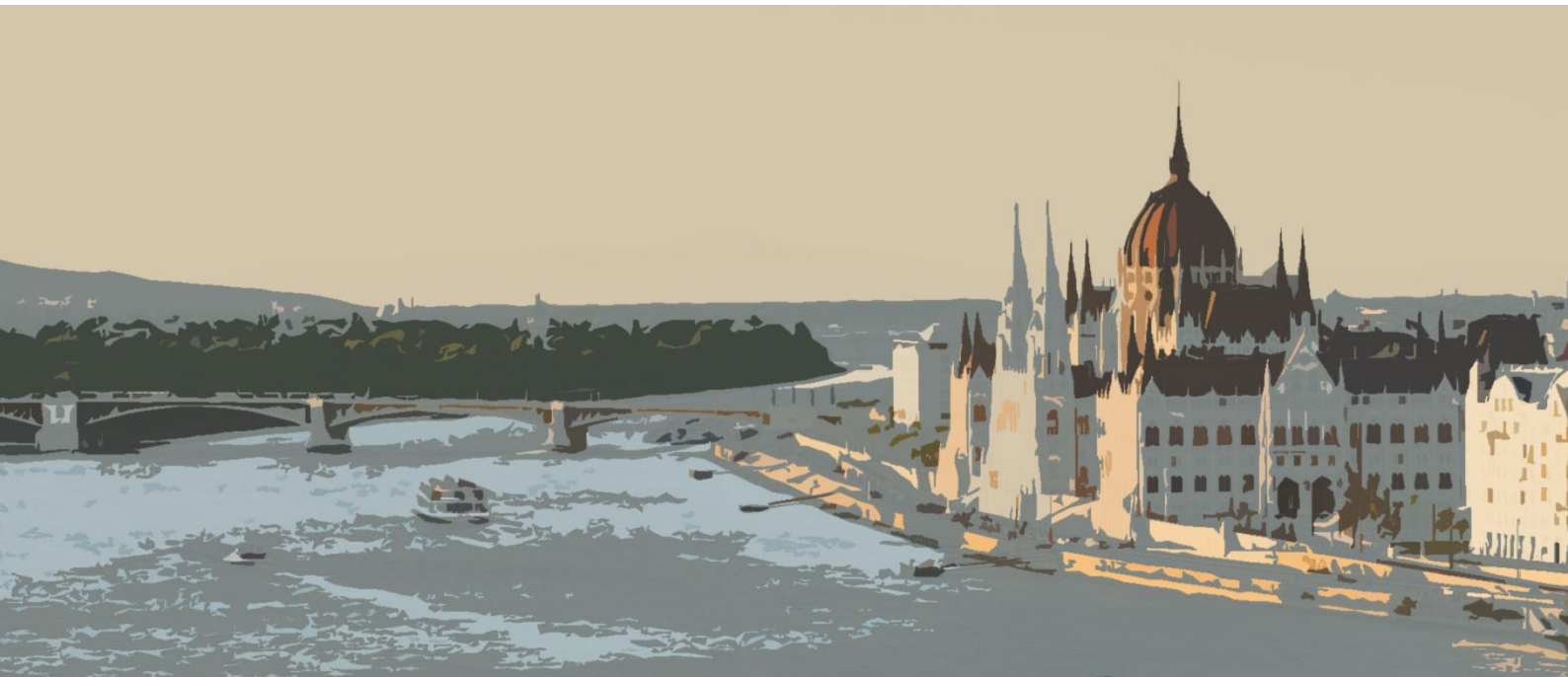

CORVINUS UNIVERSITY of BUDAPEST

31st Annual Conference of ISDRS
Budapest, Hungary

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Packaging Designer and Sustainability in Italy

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Abstract. This paper presents the results of the first research study on the knowledge and application of Ecodesign and Circular Design among packaging designers in Italy. The study was conducted by the Università Iuav di Venezia for CONAI, the National Packaging Consortium, between 2022 and 2024. It investigates the current situation regarding packaging designers by listening directly to their experiences and perspectives. Following an initial desk-based analysis, the study adopted a survey method on a defined sample (140 Italian Packaging Designers), followed by in-depth exploration through semi-structured audio-video interviews with designers of different ages and backgrounds. The first part of the research attempts to frame the terminology surrounding sustainable packaging design, Ecodesign, and Circular Design, as well as waste-prevention principles, addressing both conceptual and regulatory dimensions. The second and third parts present the findings from the survey and interviews, highlighting not only essential quantitative data but also the designers' level of engagement, their reflections and concerns, achievements and obstacles, together with their expectation and aspirations. The paper contributes in particular to SDGs 8 and 12.

1. Introduction

The sustainability of packaging is a highly topical issue of growing public interest and increasing complexity. The coexistence of traditional packaging solutions with smart packaging technologies, together with the logistical transformations driven by the widespread diffusion of e-commerce, has significantly reshaped the packaging landscape. Precisely because of its cross-cutting and systemic nature, it has become increasingly difficult to identify unambiguous definitions and shared pathways, given the multitude of actors involved and the corresponding distribution of responsibilities (CONAI, 2019). As a result, there is an increasing urgency to address the environmental sustainability of packaging, alongside the risk that such a central and inherently systemic issue may be approached in a superficial or overly idealistic manner (Acampora, 2023; Ciravegna, 2025; Pathan, 2025).

In this context, the role of design is particularly significant, as it allows for preventive action at the earliest stages of product development. Design decisions can contribute to reducing waste generation, extending the useful life of packaged products, and enabling recycling or reuse by carefully addressing material selection, structural solutions and communication strategies. For this reason, it is essential to understand which environmental preferability actions and circular economy strategies packaging designers are currently able to apply within their design processes.

This paper presents the results of a research project focused on the knowledge and application of *Ecodesign* and *Circular Design* strategies among packaging designers in Italy. The research project, entitled *Italian Packaging Design Maps* was carried out by Università Iuav di Venezia for CONAI, the Italian National Packaging Consortium, between 2022 and 2024.

Given the central role of design in the transition toward more sustainable and circular packaging systems, the research seeks to address a series of key questions: What do packaging designers think about sustainability and circularity? What does it mean, from their perspective, to design packaging according to circular economy principles? Which aspects of packaging sustainability and circularity receive the greatest attention, both in in-house technical departments and in external design agencies? And in which areas do designers perceive the need for further training or support? These questions constitute the starting point of the *Italian Packaging Design Maps* initiative.

The main objective of the research was to map the knowledge and application of circular economy strategies among firms, agencies, and technical offices primarily engaged in packaging design at the national level. This need arises from the observation that existing studies on circular economy strategies—widely developed at the international level over the past decade—tend to focus mainly on economic and managerial perspectives, individual case studies or the companies implementing them. By contrast, the design domain still lacks an in-depth investigation into the actual diffusion and practical application of these strategies within everyday design practice.

Between 2021 and 2022 the same research group of the Università Iuav di Venezia conducted a study on the presence of so-called circular design practices in Italian design studios and agencies, with a specific focus on product design. The present research builds on and complements that earlier work by shifting the focus to packaging design and by directly engaging with packaging designers themselves.

11. Literature Reviews

The research is grounded in a body of literature addressing on the role of design in enhancing environmental sustainability and circularity within packaging production and use. European Commission documents and directives related to the dual transition (ecological and digital) as well as the *New European Industrial Strategy* assign a central role to design as both a preventive actor and a catalyst of innovation. This role stems from the fact that design interventions occur upstream, at the beginning of each product life cycle. The *Circular Economy Action Plan* (European Commission, 2020) explicitly states that up to 80% of a product's environmental impact is determined during the design phase, a point already emphasized in earlier studies specifically addressing packaging (Istituto Italiano Imballaggio, 2007).

Italy has long be recognized as an international reference point for recycling practices. Since the 1990s, the country has developed systems, structures and operational models that have become influential within the European context. With respect to design issues, thanks to the consortia's efforts, tools, methodologies, awards and guidelines have been created to help designers and companies on the path toward greater environmental, economic and social sustainability of packaging.

Among these initiatives are the *Guidelines for Facilitating the Recyclability of Packaging* (CONAI, 2017), the *EcoDTool*—freely available to designers and companies (CONAI, 2023)—and the CONAI *Call for Ecodesign of Packaging*, launched in 2013. These instruments

reflect an increasing institutional effort to integrate sustainability considerations into packaging design practice.

The sustainability of the packaging supply chain is closely linked to a series of European legislative frameworks, including EU Directives 94/62/EC and 2004/12/EC, which are based on the cradle-to-cradle life cycle approach, EU Directive 2008/98/EC, which establishes the waste hierarchy by prioritizing prevention, followed by reuse and recycling. More recent regulatory developments include the 2018 *Circular Economy package* of regulations and the more recent *Packaging and Packaging Waste Regulation* (EU Regulation 2025/40) which places renewed emphasis on packaging reuse.

Given the complexity of the topics covered and, together, the widespread use of terminology that may lead to conceptual ambiguity, the first part of the research seeks to clarify the relationship between *Sustainable Design*, *Ecodesign* and *Circular Design*, as well as the principles related to waste prevention in order to establish a clear and shared conceptual framework.

According to the *Ecodesign for Sustainable Products Regulation* (ESPR), "eco-design" is defined as «the integration of environmental sustainability considerations into product characteristics and processes throughout the product value chain» (EU Regulation, 2024, art.2 comma 6). This integration results in ecodesign specifications, i.e., a set of «performance or information requirements aimed at making the product more environmentally sustainable» (art. 2 par. 7) always, however, with equal performance. The objective of this design approach is the reduction of environmental impacts, i.e., changes to the environment (whether negative or positive) resulting even partially from the product by taking into account what happens at all stages of its life cycle, from design to the management of the end of the product's first useful life and the beginning of its new lives.

To better understand what is meant, it is appropriate to compare the terms that are most commonly used when discussing the relationship between products and sustainability. Indeed, the field of ecodesign fits within the themes of *sustainable design* and *circular design*.

Within this framework, ecodesign can be situated as a specific approach within the broader field of *sustainable design*, which addresses environmental, economic and social impacts across the entire product life cycle. While *sustainable design* adopts a holistic perspective, ecodesign focuses more specifically on minimizing environmental impacts through life cycle analysis (LCA) methodologies.

Circular design further shifts this perspective by prioritizing the extension of product life and the maintenance of value over time. As articulated by the Ellen MacArthur Foundation (2013), *circular design* promotes closed-loop systems in which products, components and materials are shared, repaired, remanufactured, reused and ultimately recycled. This approach implies not only technical innovation but also a transformation of business models, favoring access, service and use over ownership.

The transition from ecodesign to *circular design* thus requires moving beyond strategies based solely on optimization and impact reduction toward more radical changes in production and consumption patterns. For designers, this entails deeper knowledge and greater attention to systemic dynamics, particularly when designing new packaging or revising existing solutions.

The ESPR incorporates elements of the three terms. In fact, the regulation includes aspects of reducing environmental impacts such as the reduction of energy and water consumption, the decrease in carbon footprint, the efficiency in the use of resources and the use of recycled

materials. To these elements, also present in previous European documents on ecodesign, the ESPR regulation adds a number of aspects related to the circularity and remanufacturability of products such as the extension of useful life (durability), the possibility of remanufacturing and recycling; the reusability, the repairability and the updating.

Most of these aspects require special attention to the compositional and formal elements of products and packaging, but also deep expertise on aspects related to environmental and social issues. Within this regulatory context, the European *Packaging and Packaging Waste Regulations* place particular emphasis on three aspects: reducing the use of resources and materials, reuse of packaging and circularity of materials (recycling and concrete use of recycled materials). Packaging reuse is especially significant, as it enables the extension of packaging life while preserving not only materials, but also structural, formal, communicative and cultural values embedded in packaging design. As always in environmental issues, this topic brings with it both excitement and some concerns (just think of reverse logistics) and reminds us how, in the case of packaging, everything has to be defined with tailored thinking in the content-container relationship and that there is no single best solution ever.

It should be remembered that achieving the objectives of design from a circular economy perspective also requires a systemic vision that allows the content-container couple (product-packaging) to be considered not only in its first life cycle, but from a multicyclical perspective within the context, flows, networks and actors involved, and necessitates robust evaluating processes that support continuous improvement (Biondi, 2003; Jedlicka, 2009; Badalucco, 2011; Acampora, 2023; Ciravegna, 2025; Pathan, 2025).

To support companies, designers and the many actors involved in the complex packaging system with respect to prevention and circularity, CONAI has defined seven Ecodesign Actions, referred to as the Seven Prevention Levers. These actions—reuse; facilitation of recycling activities; use of recycled materials; saving of raw materials; optimization of production processes; logistics optimization; and streamlining of the packaging system—represent strategic areas of intervention aimed at reducing the environmental impact of packaging across its life cycle, in accordance with a life cycle thinking approach (CONAI, 2016). These levers were adopted as one of the core analytical frameworks of the present research.

Table 1. CONAI Seven Prevention Actions (CONAI, 2016)

Action	*Description*
Reuse	Concept or design of packaging to be able to perform a minimum number of returns during its life cycle, for a use identical to that for which it was conceived.
Facilitation of recycling activities	Facilitation of packaging recovery and recycling steps, such as separability of different components (e.g., labels, closures and dispensers, etc.).
Use of recycled material	Substitution of a portion (or all) of virgin raw material with recycled/recovered material (pre-consumer and/or post-consumer) to contribute to a reduction in resource drawdown.
Saving of raw material	Reduction in the consumption of virgin raw materials used in the manufacture of packaging and consequent reduction in weight for the same packaged product and performance.
Optimization of the production processes	Implementation of innovative packaging production processes that can reduce energy consumption per unit produced or reduce production waste or, in general, reduce the use of production inputs.
Logistics optimization	Improving storage and display operations, optimizing loads on pallets and transport vehicles, and refining the relationship between primary, secondary and tertiary packaging.
Streamlining of the packaging system	Integration of multiple functions into one packaging component, eliminating one element and thus simplifying the system.

12. Methodology

The research was then structured in three main phases: an initial conceptual and theoretical framing of ecodesign and circular design issues within the specific field of packaging design; a quantitative survey addressed to packaging designers; and qualitative phase consisting of in-depth interviews.

For the definition of the key elements to be investigated and for the formulation of the questions of the questionnaire, a matrix of criteria was used that composes the indications of the design strategies of the *Upstream Innovation* proposed by the EllenMacArthurFoundation (EllenMacArthur, 2020), the indications of the *Ecodesign for Sustainable Products Regulation* (EU Regulation, 2024*),* the drafts of the *Packaging and Packaging Waste Regulations* (2022-24) and, above all, the seven prevention levers of Conai (Conai, 2016). The prevention levers can lead to upstream prevention of the environmental impact of packaging in its life cycle, and it is at this 'upstream' stage that packaging designers act. For this reason, levers proved to be particularly useful at various stages of the investigation.

Compared to dominant research streams in packaging design, this research shifts the analytical focus from the artifact or the system to the designer as a situated professional actor (Table 2). While design for sustainability approaches tend to propose normative and prescriptive models, and engineering-based studies consider packaging as a problem of measurable performance, this research adopts a bottom-up, empirical perspective that foregrounds professional practice. In doing so, the work bridges the gap between theoretical frameworks and real-world design activity, highlighting the constrained and negotiated agency of packaging designers within complex production systems.

The research activities were organized into the following work packages:

. development of a criteria matrix for mapping actors involved in circular design processes in Packaging Design together with the definition of a country-specific survey methodology based on network analysis, literature review and questionnaires;

. implementation of the survey and mapping process, including the creation of a structured repository of information on design studios and designers applying circular design strategies in packaging;

. completion of the mapping activity and selection of representative case studies for further investigation (through questionnaires and interviews) followed by data processing and the development of infographics to support the interpretation of results.

Table 2. Comparative Matrix on the theoretical approach of this research compared to dominant research streams in Packaging Design

Analytical Dimension	***"Italian Packaging Design Maps"***	*Packaging Design for Sustainability*	*Packaging Engineering*	*Marketing & Consumer Studies*
Object of study	The packaging designer as a professional actor	The packaging as a sustainable system	The packaging as a technical artifact	The packaging as a communication stimulus
Main contribution	Makes visible the decision-making complexity of designers	Provides principles and frameworks	Optimizes environmental and functional performance	Explains communicative effectiveness
Unit of analysis	Professional practices, designer communities	Processes, design models and frameworks	Materials, structure, performance metrics	Consumers, perception, behavior
Methodological approach	Empirical–qualitative (mapping, surveys, critical analysis)	Normative and prescriptive	Quantitative and experimental	Quantitative and behavioral
Role of the designer	Central actor, with negotiated and constrained agency	Change agent	Executor of technical specifications	Mediator of brand strategies
Theory–practice relationship	Bottom-up (from practice to theory)	Top-down (from theory to practice)	Technical–applicative	Strategic–applicative
View of sustainability	Contextual, situated, negotiated	Systemic, design-driven	Measurable, parametric	Reputational, perceived
Acknowledged limitations	Strong contextual specificity	Risk of detachment from professional practice	Reduction of design agency	Marginalization of the design process

In the first phase of the research activity, the objectives, methodological approach and terminological framework concerning Sustainable Design, Ecodesign and Circular Design were defined, as discussed in the literature review.

In the second phase, the research moved to an operational reconnaissance stage which included the following steps:

. definition of mapping criteria and of survey sample;

. formulation of survey questions;

. survey administration (the online questionnaire solution was preferred);

. data processing, infographic and determination of subsequent in-depth steps.

The criteria for selecting the survey sample included the following characteristics:

. professionals involved in ecodesign and circular design processes in Packaging Design (including packaging designers, product designers, graphic designers);

. employed in professional studios, communication agencies, technical departments of packaging manufacturers, technical or marketing departments of user companies;

. currently professional activity in the field;

. location in Italy.

The research channels used to identify the sample included web-based searches, industry databases, sector-specific publications and professional social media platforms. This process resulted in the creation of three distinct lists: professional design studios and agencies; in-house designers working within user companies; and designers operating in the technical departments of packaging manufacturing companies. A total of 140 Italian packaging designers were identified as recipients of the survey.

At the same time, the structure of the questionnaire was defined and it consisted of 22 questions organized into three thematic sections:

1. general and profession information (age, profession, fields of activity, % of packaging projects in total work done, design type, materials mainly used) - total 6 questions

2. packaging design training and sustainability and circularity training (type of training, location, possible sustainability and circularity training) - total 4 questions

3. knowledge and future needs on circular economy and sustainability issues in packaging design (approach, CONAI levers, production sectors involved, good examples, measurement systems used, future needs and demands) - total 12 questions.

The completion rate was of 43%. The geographical distribution of the designers who responded to the questionnaire is spread across 15 regions, mainly in northern Italy. The highest attendance was in Lombardia, followed by Veneto, Piemonte, Lazio and Campania. As far as gender is concerned, 57% of the sample identifies as male and the remaining 43% as female.

To further explore themes emerging from the survey, a third research phase was dedicated to semi-structured audio-video interviews with selected designers. These interviews were conducted online and disseminated through short video formats during the 2023 ASviS Sustainable Development Festival. Interviews were conducted with:

. the identification of case studies of particular interest as being able to represent the main views and design attitudes that emerged in the survey;

. the development of the interview structure and its personalization;

. the conducting of the semi-structured and audio-video interviews with privileged witnesses;

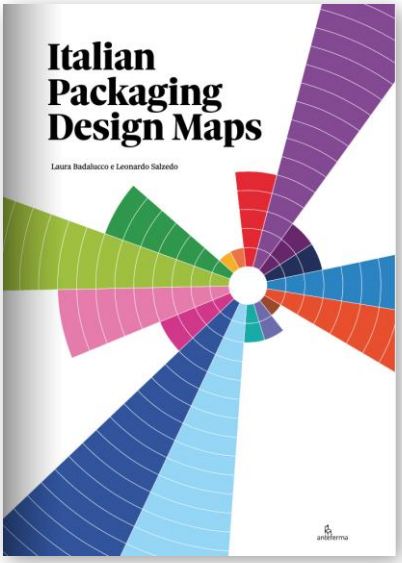
. the processing and synthesis of interviews.

13. Results

The results of the research were published in an open source book entitled *Italian Packaging Design Maps* with editorial concept, graphic design and infodesign by Paola Fortuna and Giulia Saccon (studio +fortuna, Trieste, Italy).

The book is structured into three main sections: an overview of the research objectives and methodology; the presentation and discussion of the survey results; and a synthesis of the interviews.

Figure 1. The cover and some pages of the *Italian Packaging Design Maps* open source book, edited by Anteferma Edizioni in 2024 (Badalucco, Salzedo, 2024).



13.1. Survey Results

Following the definition of the research questions and identification of dissemination channels, the online questionnaire was pre-tested with a sub-sample of ten participants to validate its clarity and effectiveness. Minor revisions were subsequently made to simplify language and improve comprehension. The revised questionnaire was administered online to the full sample of 140 designers. The administration period ran from the end of 2022 to early 2023 with an initial intermediate presentation, internal to CONAI, in March 2023 and a public dissemination of the results in the webinar entitled "Designing packaging: EcoD Tool CONAI 2.0, new functionalities for more circular packaging" in May 2023.

A total of 60 completed responses were received, corresponding to a response rate of 43%.

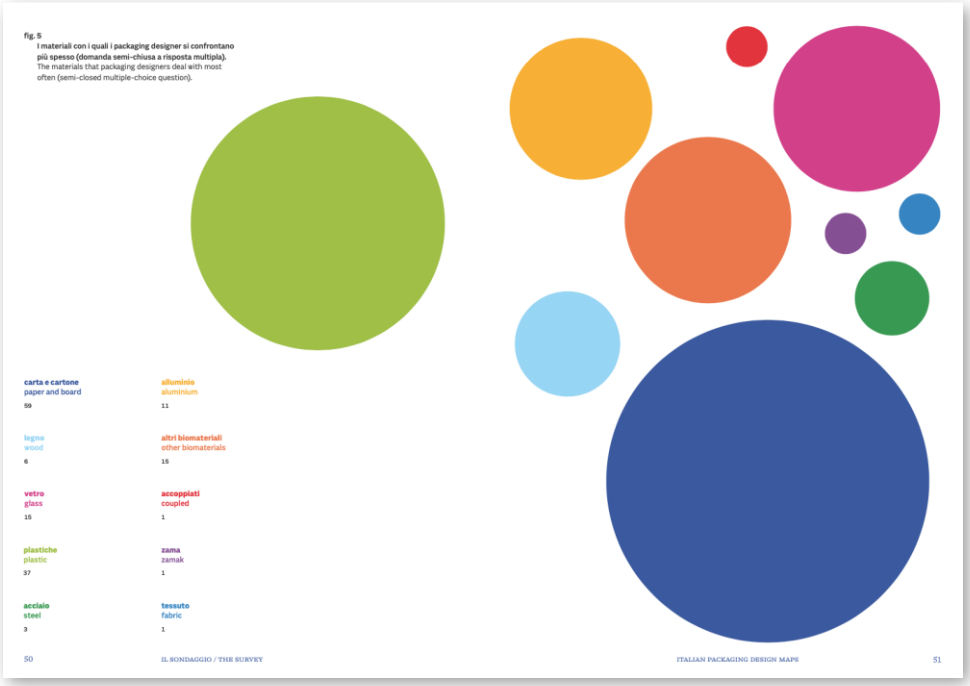
The survey results are presented across three areas: general and professional characteristics of respondents; education and training; and current practices and future needs related to sustainability and circular packaging design.

General & Professional Information. The answers to the first questions give us an overview of the survey responders. They are based across 15 Italian regions, with the highest concentration in Lombardia (15 people), followed by Veneto (10), Lazio (6) and Campania (4). In terms of gender distribution, 57% of the participants identifies as male and 43% as female. The breakdown by age group is as follows: 60% are between 30 and 49 years old, 20% are between 18 and 29 years old, 16% are between 50 and 60 years old and 4% are over 60 years old.

A fourth question was related to the definition of one's profession. Today, we still find at least three types of packaging design: the packaging studios and agencies that offer an internal or external service to advertising and branding agencies; the technical and R&D departments of transforming companies (packaging manufacturers) in constant dialogue with the companies that use the packaging; the product design studios that deal with packaging on a par with other types of products.

The heterogeneity of the profession is confirmed by the answers received: packaging designers are predominantly (60%), but participants could give more than one answer and also identified themselves in the professions of product designers and graphic designers who are also involved in the design of the structural and communicative aspects of packaging (around 50%). The remaining figures consisted of R&D department members, accounts, technical specialists, creative directors, illustrators and brand consultants. Almost half of the respondents work in the packaging manufacturing (25.5%) or user industries (22.2%). The 15.8% work in a packaging or communication agency and 9.5% in an external design studio. A particularly striking figure is that of freelancers, which stands at around 22%. Completing the group of survey participants are also two people working in universities and research centers and one in a certification body.

Figure 2. The materials that packaging designers deal with most often. The answer to this question could be multiple

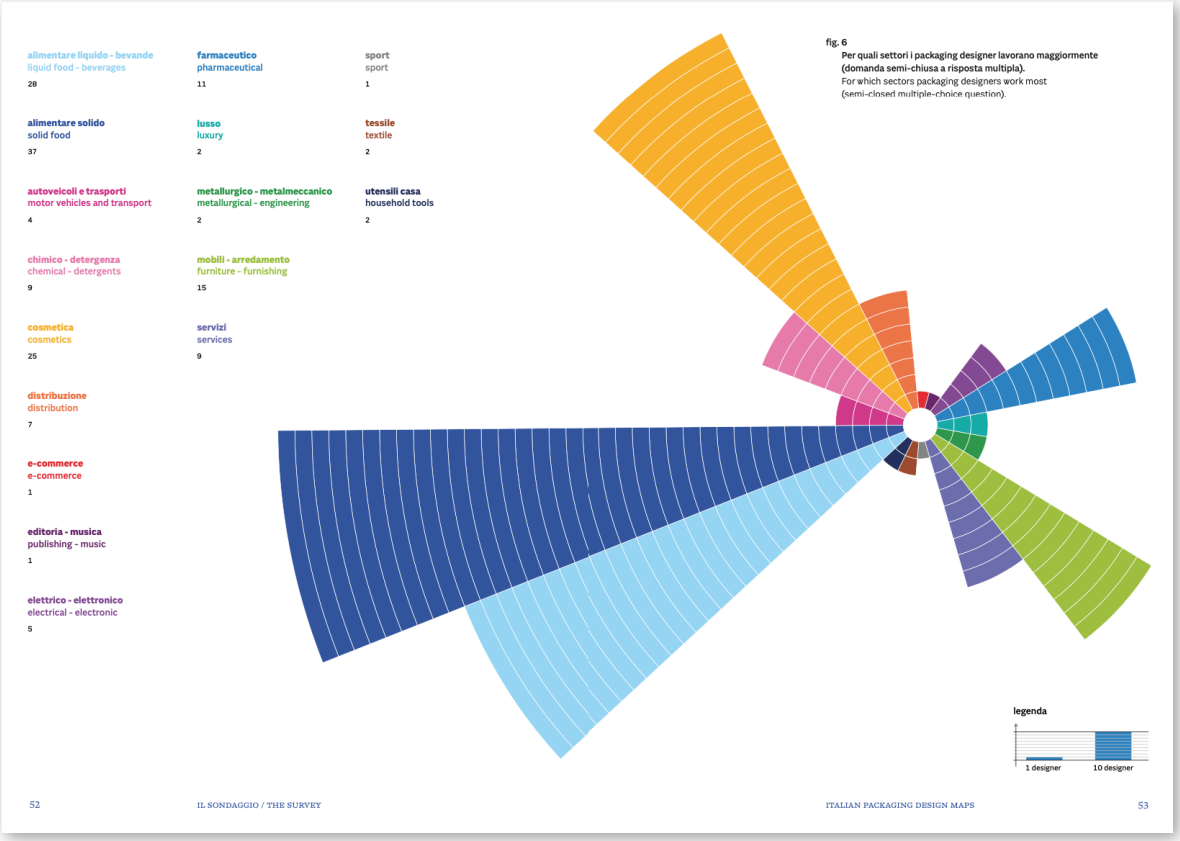


A further investigative element is the materials that packaging designers deal with most often in their designs (Fig.2:). As can be imagined, there is a predominance of cellulosic materials (paper, cardboard) used in projects by almost all designers (94%). In second place are polymeric materials used by almost 60% of the designers. Almost a quarter of the designers also dealt with glass and biomaterials followed by aluminum (11 of 60 designers), wood (6 of 60) and steel (3 of 60).

Given these indications, designers were asked which sectors they mainly work in. The most frequent sectors are food (59% of respondents), beverages (mentioned by 44%) and cosmetics (40%). This is followed by furniture, pharmaceuticals, detergents, electrical/electronic products and clothing (Fig. 3).

The section then ended with a question on the participant's current projects. The majority of designers indicated that they are working on primary packaging (48%), 41% on secondary and the remainder on tertiary packaging. The structural and graphic aspects are treated consistently with a slightly higher demand for design on structural packaging (indicated by 56% of the participants).

Figure 3. For which sectors packaging designers mainly work in (semi closed multiple choice question).



Education & Training. A second part of the questionnaire was aimed at understanding how and where participants acquired their education on packaging in general and whether or not they felt the need to deepen their knowledge and skills on the topics of sustainability and circularity.

This section was built around four questions: what packaging education the respondents received; in which cities; what additional skills, apart from design skills, are essential in their work (in the economic, technological, social, etc.); and whether and how they have furthered their education on environmental sustainability and the circular economy. Most respondents held a bachelor's or master's degree, while a significant proportion reported having acquired their skills through self-directed learning: one in four designers, a decidedly significant number. On the other side, only a small number had completed doctoral-level training.

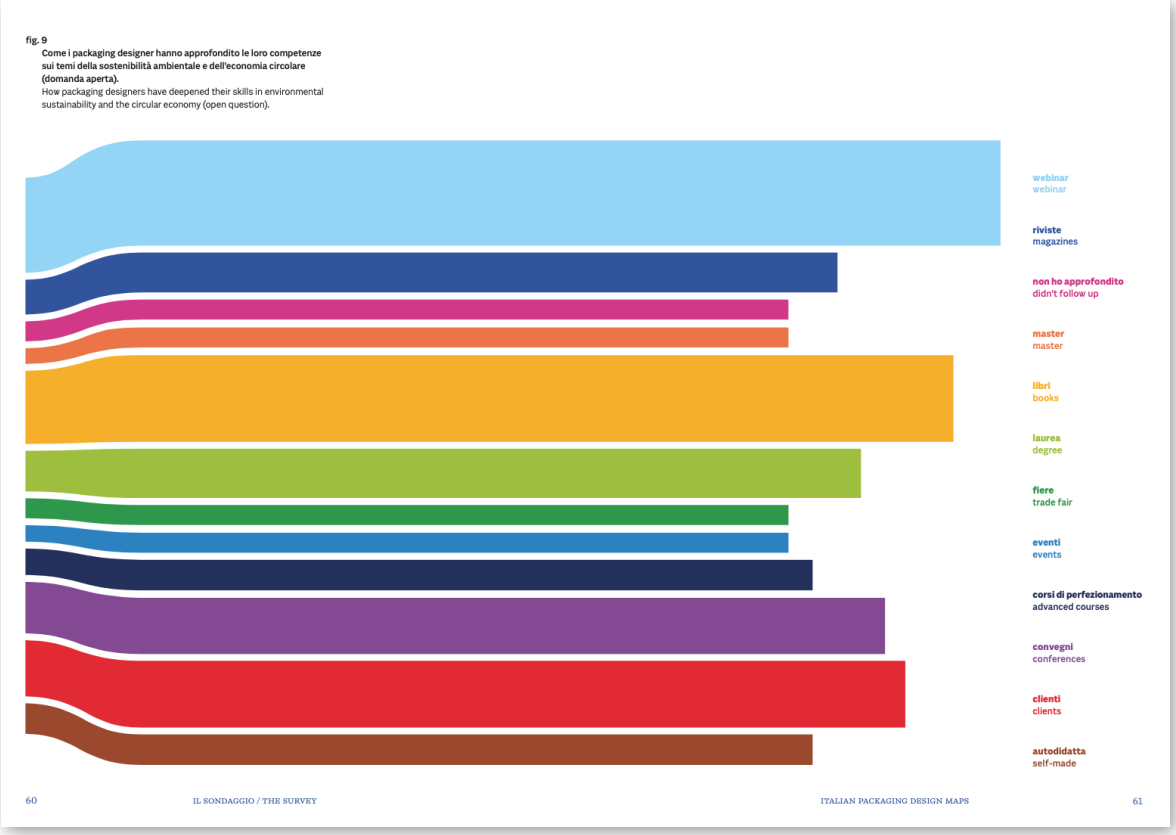
Geographically, most universities with a specific training in packaging are in Lombardia (26%, with a particular focus on Milano), Veneto (22%), and Piemonte (12%). In this case, there is a centrality of training in the northern regions, which has led to a movement of those interested from their region of origin towards those three regions.

In addition to design skills, respondents emphasized the importance of competencies related to materials and production technologies, marketing and communication. Other key words that

emerged in this part of the survey are: planning and logistics, social and relational focus (in particular the customer/supplier relationship). Innovation, digitalization, recyclability and environmental analysis also emerge among the words mentioned, although less frequently.

The last part of this section concerns specific training on the topics of environmental sustainability and circularity. To the compulsory question «Have you deepened your training on sustainability and/or circular economy issues? If yes, how» only three respondents answered in the negative. The remaining survey participants mainly mentioned the use of webinars, books and magazines; thirteen indicated training obtained during their studies (Fig. 4). Conferences, trade fairs and events are also cited as sources of information, demonstrating a widespread desire to learn more about these topics.

Figure 4. How packaging designers have deepened their skills in environmental sustainability and circular economy (open question).



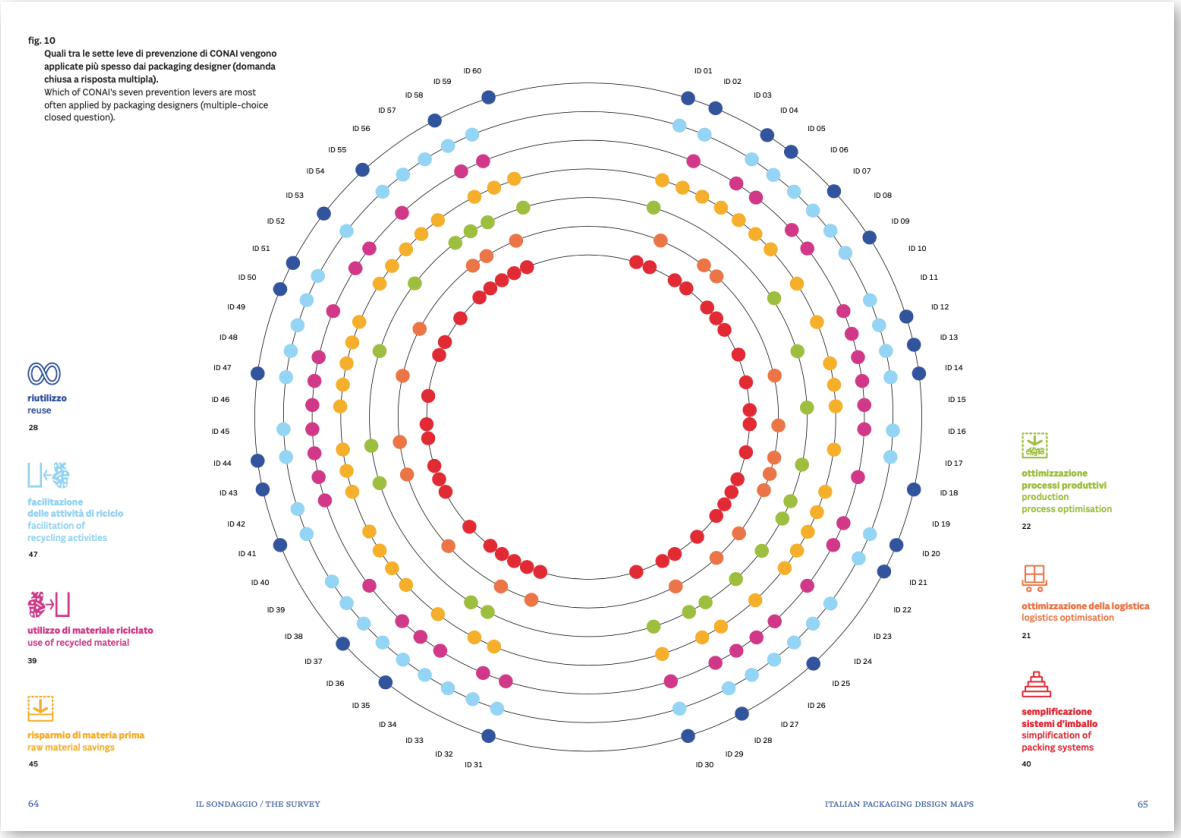
Sustainability & Circular Packaging Design. The last section of the survey is designed to understand if and how packaging designers are applying the knowledge on sustainability and circularity in the packaging projects (or concepts) they are working on. This is the largest section of the questionnaire, consisting of 12 questions and is the one that offers the study several foods for thought.

All respondents reported applying at least one of CONAI's Seven Prevention Levers in their design work. (Fig. 5). All survey participants mentioned at least one of the levers and the percentages of knowledge and use of the various strategies for improving the environmental

quality of packaging tended to be high or very high. The most frequently used lever is the facilitation of recycling activities, cited by almost 75% of survey participants. This is followed by the saving of raw materials (used by around 70% of the designers with environmental and economic sustainability in mind), the use of second raw materials and the simplification of the packaging system, levers considered in the project by two thirds of the questionnaire participants.

Among the business sectors, those generally indicated in the previous section as most active in innovation (food, beverages and cosmetics) are also those mentioned here as most sensitive to innovation for the purpose of improving the environmental quality of packaging. In particular, more than 60 per cent of the responses indicated the food sector, while requests from companies in the beverages and cosmetics sectors were between 35% and 40%.

Figure 5. Which of CONAI prevention levers are most often applied by Italian packaging designers (multiple-choice closed question).



Once the sectors were understood, it was asked from which actors the request for sustainability and/or circularity of packaging came most frequently. The request seems to come most often from the marketing department (indicated by 59% of the respondents) but it is just as frequently from a particular sensitivity of the designer who proposes an environmentally

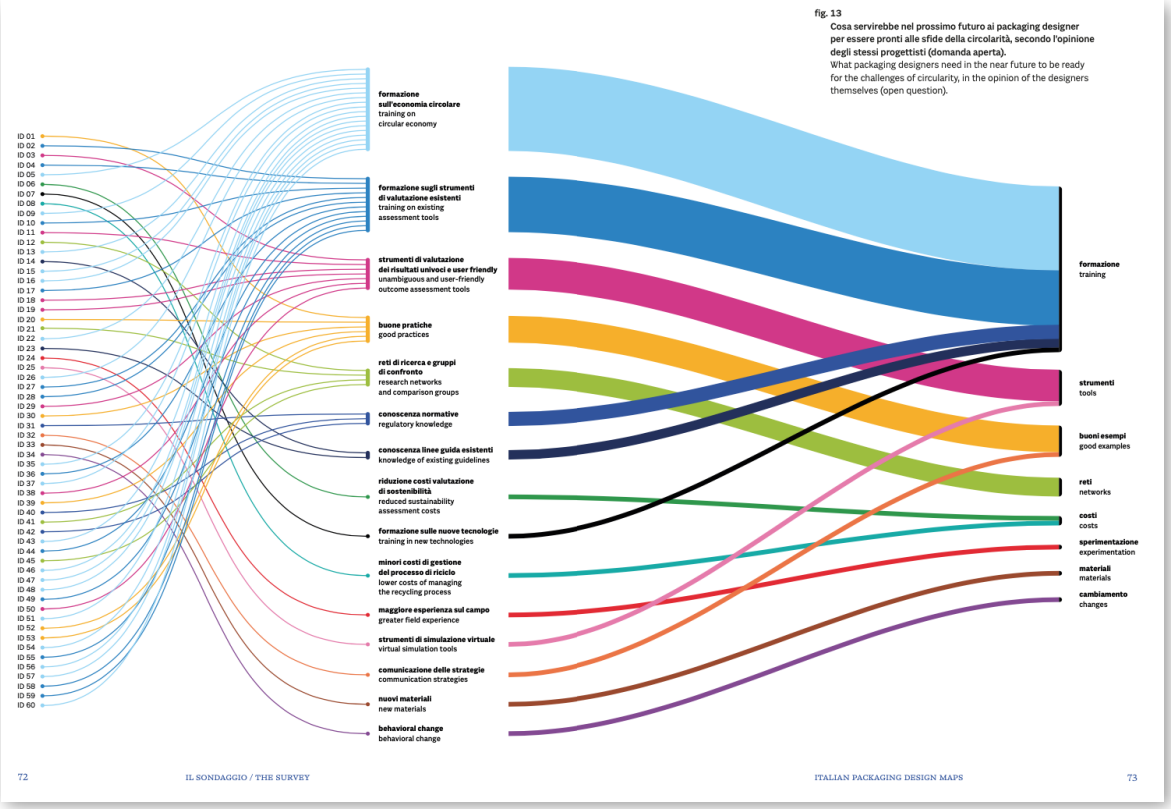
preferable innovation on his own initiative. Between the user company and the packaging manufacturer, it is the user company that most frequently asks for Ecodesign strategies to be included in the design (three times as often as the packaging manufacturer). The role of the packaging designer is therefore confirmed as one of synthesis and connection between the various players in the supply chain, a persistent characteristic in the history of this profession.

The word *recyclable* was among the most frequently mentioned in the designer's examples of environmental sustainability. Many of the cases refer to the use of cellulosic materials, a change of material (mainly from polymer to cellulosic) or a reduction in the number of materials with the elimination of non-recyclable elements. By contrast, still today very few cases refer to reusable packaging or to system and logistics issues.

Having concluded this part, we moved on to investigate the tools currently used in the design process and those required for the future. Of all the results obtained from the research, those on measurement systems and requirements for the future proved to be of particular interest: more than half of the participants reported that they do not use any tools (56%). This could mean, for example, that more than half of the designers entrust the evaluation task solely to their own experience and knowledge or that they leave the quantitative evaluation of their work to others, outside the design process. In fact, reading the comments in the open questions reveals, on the one hand, a difficulty in using evaluation tools because they are considered too complex and, on the other hand, the thought that this activity is the prerogative of other professionals and not of designers. Among those who, on the other hand, use quantitative analysis tools, the best known are the LCA (Life Cycle Assessment) and the simplified LCA, while CONAI's EcoD Tool - created in 2020, based on the simplified LCA and subject to periodic updates - although it is a free web tool designed specifically for packaging eco-design, was cited by only 5 designers.

The research showed that communication and training actions on quantitative or qualitative analysis tools for new packaging solutions are still needed. This need for training also emerges strongly from the survey participant's requests, particularly when moving from current actions for environmental sustainability to the present or future intervention of design in the circular economy. The last questions of the questionnaire were aimed precisely at understanding what changes in the evaluation of designers when moving from Ecodesign to Circular design. In the answers to the questionnaire, it can be read that this growth in attention must be accompanied by intensive training activities.

Figure 6. What packaging designers need in the future to be ready for the challenges of circularity (open question).



First of all, more knowledge about the circular economy in general and *upstream innovation* strategies useful for regenerative packaging processes, and then about existing evaluation tools, regulations, guidelines and new technologies. The topic of training is mentioned by more than half of the participants (Fig. 6). A second theme is the implementation and promotion of new evaluation tools that offer unambiguous and user-friendly results (here we return to the issues set out in the question on measurement systems) and the dissemination of good practices. Aspects related to cost reduction and the invention of new materials, on the other hand, are scarcely mentioned.

The survey concluded with a second question on the future: what will be the key elements in the coming years? The most frequently mentioned word was *reuse*, which includes solutions with refills, take back, etc. The other words most frequently mentioned are the use of *environmentally sustainable materials*, *recyclability*, *transparent information* and *user awareness*. Not frequently mentioned, but also present in the list of responses are a greater focus on economic sustainability, the use of unambiguous and shared evaluation criteria, systemic supply chain collaboration, bottom-up innovation, reverse logistics, changing business models in the production and use of packaging, and consumer education. This is a very rich set of words, meanings and variables expressing the desire to rethink packaging from a regenerative perspective, but at the same time showing that need for training and tools that emerged earlier. A demand for commitment from all players in the packaging production and use system that

considers both environmental and social aspects as well as economic sustainability in an integrated manner and that can offer proposals and solutions to be used by even the smallest structures.

13.2. The interviews

The third phase of the research was dedicated to interviews with privileged witnesses; a synthesis of what emerged in long chats, starting with an outline of questions, but then going where the reasoning led, in a freer flow. It was an opportunity to observe different points of view and learn something new from everyone.

The interview phase involved six experienced designers representing different generations and professional backgrounds within Italian packaging design. The interviews provided qualitative insights into designers' perspectives on sustainability, client demand and the challenges of implementing circular economy principles in practice. The interviews were conducted online in February and March 2023. The packaging designers interviewed were:

. Elio Carmi, Founder Studio Carmi & Ubertis

. Tommaso Ceschi, Founder Studio Tommaso Ceschi

. Matteo Civaschi, Art Director and Founder Studio Hangar 57

. Jessica Dagrada, Co-Founder Studio Next Brand

. Antonella Manenti, Co-Founder of Studio Henry & Co.

. Davide Mosconi, Art Director Studio Auge Design

A summary of the interview texts with a brief introduction of the interviewees can be found in the research book (Badalucco, Salzedo, 2024). In a nutshell, the professionals who responded were extremely willing to bring up issues related to the current situation of packaging design at the national level, offering opinions and often even solutions based on their professional experience and unreservedly recounting the projects they are working on, as well as those they have already implemented.

According to the interviewees, the result is a fairly positive picture of the direction that packaging design in Italy is taking with regard to sustainability and circular economy issues. Nearly unanimous is the finding of a gradual increase (from 70 percent to 100 percent) in requests for sustainable projects from clients from 2020 and the consequent strengthening of internal conversations on these issues during conceptualization and project offerings.

As in the survey, interviewees also emphasized the need for further education, clearer evaluation frameworks and greater integration of assessment tools into everyday design practice.

14. Conclusion

This research provides a comprehensive snapshot of current practices related to environmental sustainability and circular economy strategies among packaging designers in Italy.

The research findings confirm what was postulated at the beginning of the activity: while awareness and application of recyclability-oriented solutions are widespread, reuse and multi-cycle system innovations remain less developed. According to the designers interviewed, there is a fairly positive picture of the direction that Packaging Design in Italy is taking with regard to sustainability and circular economy issues. Almost unanimous is the finding of a gradual

increase of requests for sustainable projects: packaging ecodesign is emerging as a key strategy for promoting an increasingly circular economy.

However, the path toward improving environmental sustainability and toward appropriate solutions to a circular economy is not an easy one, and although the role of designers is central as the first actors in the principle of prevention, their action sometimes still faces difficulties and barriers. Some difficulties that emerged from the survey and interviews relate to well-known issues, foremost among them the comparison between environmental and economic sustainability. The issue of the relationship between the cost and time of project (and product) development and the need to address and communicate environmental improvement, on the other hand, are the focus of many comments and observations from participants. In a nutshell, several designers complained about the difficulty of proposing or bringing environmental sustainability paths to a conclusion when they clash with economic issues.

It should, however, be noted that the need for attention to environmental aspects is very much present, especially in some sectors (food, beverage and cosmetics sectors), but this desire is not always transformed into concrete actions, especially at the system level. On the positive side, in each case, all survey participants recounted examples and solutions of their own projects that have made it possible to produce environmentally preferable packaging. Moreover, from this point of view, it seems to emerge clearly how counterproductive and dangerous any *greenwashing* actions are, even unintentional ones and how, for this, extreme care is needed: one must act tangibly and be able to tell with clarity, objectivity and relevance the environmental performance achieved. Instead, no reflections related to the critical issues of *greenhushing* (failure to communicate the sustainability path taken) are reported – with rare exceptions.

In addition to these more predictable findings, other elements present in the responses open reflections and insights for further study and new research. For example, the need for more training of designers on the issues of circularity strategies, regulations, assessment tools and guidelines became clear, but, from another point of view, the doubt was noted by many that it should be the designer who should address the issue of quantitative assessment, given also the depth of knowledge required. Tools such as LCA, even in its simplified version, are still marginally used by those involved in the structural design of packaging. In other words, there is a clear need to understand how to evaluate improvement, but the question that arises is: how much and how can qualitative-quantitative evaluation of environmental improvement fall within the action boundaries of designers? Which tools can be used by designers, and which by in-house or external environmental assessment experts?

These questions are of particular interest when referring not to a posteriori evaluation, but to the use of such tools comparatively during the design journey, just as a means itself of the innovation process. This topic has been the stimulus for the construction of free tools such as the EcoDTool or the CONAI guidelines which are dedicated precisely to the design phase. These tools are well known, but not yet used as a habit by packaging designers, so further action will be necessary for their dissemination and the development of new solutions for further training.

A second issue relates to the relationship between improvement ‘by quantitative reduction’ (of materials, use of other resources, emissions) or ‘by overall change’, the latter being particularly required in the logic of the circular economy. The question relates, for example, to situations in which a multicyclical dynamic is reflected rather than a single cycle, as is the case with the eventual shift of packaging toward reuse. Although the *cradle-to-cradle* logic is known and the idea of first regeneration (of the material or product) is clear, it seems more complex to think in terms of multiple cycles and, even more so, of interweaving different design strategies

in order to achieve as many return cycles as possible. In these cases, it is possible that more material may be required, just as an example, to make the packaging suitable for return to the cleaning, filling, distribution, consumption cycle, and this puts a strain on the design habits on the single quantitative reduction. Just think that saving raw materials is one of the most widely used sustainability logics due to the obvious environmental and economic benefits, and research into new materials is among the demands for the near future. The effects on design of knowledge of the dynamics of return logistics, to give just a few examples, are still to be explored. Designers also demand training on these topics and also feel the need to gain more experience in order to be able to intervene effectively in cases where these logics are preferable. From these observations, *training*, *tools*, *materials* and *experience sharing* are the most frequently cited keywords. Among these, there is a strong desire for in-depth study and knowledge that can be found at different levels, starting from university or technical postgraduate training to dissemination initiatives aimed not only at professionals, but at the widest possible audience.

The results of this research want to be a step to support this path towards a greater knowledge of how the designer can take action in the circular economy and which upstream innovation strategies will be increasingly useful for the regenerative processes of packaging in the future.

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References

Acampora, A., Pratesi, C.A., edited by, *Economia circolare. La sfida del Packaging*, Milano: Franco Angeli.

Badalucco, L., (2011). *Il buon packaging. Imballaggi responsabili in carta, cartoncino e cartone.* Milano: Edizioni Dativo.

Badalucco, L., Salzedo, L., (2024), *Italian Packaging Design Maps*. Conegliano: Anteferma Edizioni. DOI: https://doi.org/10.57623/979-12-5953-081-3.

Biondi, V., edited by, (2003). *Eco-design e prevenzione per l'imballaggio cellulosico.* Milano: Ipaservizi Editore.

Ciravegna, E., edited by, (2025), *FuturE-Pack. Designing Smart Packaging for Circular and Sustainable Made in Italy*, Bologna: Bologna University Press. DOI: https://doi.org/10.30682/9791254776711

CONAI, (2016). *Guidelines for Facilitating the Recyclability of Packaging*. Available at: https://www.progettarericiclo.com [Accessed 27 August 2025]

CONAI, (2019). *Thinking Circular – resources and ideas for sustainability.* Milano: RCS Media Group. Available at: https://www.conai.org/wp-content/uploads/2020/11/Pensare_Circolare_CONAI_2019.pdf [Accessed 27 August 2025]

CONAI (2023). *EcoDTool,* Available at: https://www.ecotoolconai.org [Accessed 27 August 2025]

Ellen MacArthur Foundation (2013), *Toward the circular economy. Vol. 1.* Ellen MacArthur Foundation. Available at: https://www.ellenmacarthurfoundation.org [Accessed 27 August 2025]

Ellen MacArthur Foundation, (2020). *Upstream Innovation. A guide to Packaging Solutions.* Available at: https://www.ellenmacarthurfoundation.org [Accessed 27 August 2025]

European Commission, (2020). Communication from the Commissione to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions. A new Circular Economy Action Plan For a cleaner and more competitive Europe. COM/2020/98 final. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0098 [Accessed 27 August 2025]

EU Directive 94/62/CE of the European Parliament and of the Council fo 20 Dicember 1994 on packaging and packaging waste (PPWD). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:31994L0062 [Accessed 27 August 2025]

EU Directive 2008/98/CE of the European Parliament and of the Council, of 19 November 2008 on waste and repealing certain Directives. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32008L0098 [Accessed 27 August 2025]

EU Regulation 2024/1781 of the European Parliament and of the Council of 13 June 2024 establishing a framework for the setting of ecodesign requirements for sustainable products (ESPR). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202401781 [Accessed 27 August 2025]

EU Regulation 2025/40 of the European Parliament and of the Council of 19 December 2024 on packaging and packaging waste (PPWR). Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:L_202500040 [Accessed 27 August 2025]

Istituto Italiano Imballaggio, (2007). *Linee Guida per l'etichettatura ambientale degli imballaggi.* Milano: III.

Jedlicka, W., edited by, (2009). *Packaging sustainability. Tools, Systems and Strategies for Innovative Package Design,* John Wiley & Sons, Hoboken.

Pathan, R.K., Aurisicchi, M. (2025), *Design framework for circular and sustainable packaging design*, in Proceedings of the Design Society, Volume 5: ICED25. DOI: https://doi.org/10.1017/pds.2025.10131