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Exploring the circularity potential of the Hostel Sector

A Circular Economy approach to a Hospitality Niche

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Index

List of Figures and Tables

List of abbreviations

CE	Circular Economy
CIE	Circular Industrial Economy
CN	Carbon Neutrality
EMF	Ellen MacArthur Foundation
HW	Hostelworld
HI	Hospitality Industry
ID	Industrial Districts
IE	Industrial Ecology
IS	Industrial Symbiosis
OTA	Online Travel Agent
SD	Sustainable Development
SDGs	Sustainable Development Goals
STD	Sustainable Tourism Development
UNWTO	United Nations World Tourism Organization

Abstract – English

Background: The detrimental environmental impact of traditional linear economic systems underscores the pressing need for a paradigm shift toward sustainable development across diverse sectors. This dissertation investigates the implementation of circular economy principles in the specific context of hostels, a niche area of the hospitality industry.

Methodology: After providing an overview of the circular economy and its relevance to the tourism and hospitality industries, a qualitative analysis has been conducted to assess circularity in the hostel sector. A revised version of the ReSOLVE Framework has been used to examine circular economy measures implemented by six assessed hostels and categorized into six dimensions: Regenerate, Share, Optimize, Loop, Virtualize, and Exchange.

Findings: The analysis is meant to estimate the feasibility, innovation, and gaps in circularity implementation in the hosteling category, indicating a ranking of the assessed ReSOLVE dimensions, and proposing opportunities for improvement.

Keywords: Hostels, Circular Economy, Sustainable Tourism Development, Hospitality Industry, ReSOLVE Framework

Abstract – Italiano

Premessa: Le esternalità ambientali negative di modelli di sviluppo economico lineare, rendono necessario e urgente un cambio di paradigma orientato allo sviluppo sostenibile in differenti settori. Questo lavoro di ricerca e analisi approfondisce l'applicazione dei principi dell'economia circolare in una nicchia dell'industria dell'ospitalità: il settore degli ostelli.

Metodologia: Lo studio parte da una panoramica sull'economia circolare e la sua rilevanza strategica per l'industria del turismo e dell'ospitalità. Segue un'analisi qualitativa per la valutazione della circolarità nel settore degli ostelli. Attraverso un adattamento del metodo ReSOLVE, le diverse azioni di economia circolare implementate da sei ostelli selezionati sono state classificate in sei dimensioni specifiche, identificate come: Rigenerazione, Condivisione, Ottimizzazione, Ciclo, Virtualizzazione e Interscambio.

Risultati: L'analisi valuta la fattibilità, l'innovazione e le debolezze nell'implementazione dell'economia circolare nel settore ostelli, ordinando in una classifica le dimensioni ReSOLVE e proponendo opportunità di miglioramento ad esse correlate.

Parole chiave: Ostelli, Economia Circolare, Turismo Sostenibile, Industria dell'ospitalità, Metodo ReSOLVE

Introduction

In January 2024, while this dissertation was being written, the average global temperature surpassed the 1.5-degree increase threshold since the pre-industrial era, marking the highest temperature ever recorded (Copernicus, 2024). At the beginning of February, a foot of torrential rain fell in just 24 hours in California, resulting in 400 mudslides (The Guardian, 2024). These are just two of the most recent examples of the devastating effects of climate change. Future instability is becoming increasingly evident, climate denialism is by now ineffectual, and new solutions for addressing the environmental crisis are emerging.

During this unprecedented historical time, the concept of circular economy is gaining traction to contrast the detrimental effects caused by human development within the linear "take-make-dispose" model of production and consumption (Furkan, 2017). Circularity, currently being explored in the economy, has its roots in academic discussions spanning over a century (Bompan & Brambilla, 2021) and in the assumption that waste is a human-made concept that nature does not recognize (McDonough & Braungart, 2002). This paradigm shift requires a total rethinking of the economy, perceiving its complexity and cross-sectoral nature as an opportunity to manufacture products and provide services with systematicity and circularity in mind (Manniche, Larsen, & Brandt , 2017). One company's waste can become input for another; design should take distance from the use and consumption of finite resources; and the 'end-of-life' concept may be replaced by regeneration (Ellen MacArthur Foundation, 2019). For the transition to a more circular economy to be effective, widespread change in various interrelated sectors is required (Ellen MacArthur Foundation, 2015). As a result, a circular approach is particularly relevant for the tourism industry, which is made up of several supply

chains and is highly interconnected with other industries such as mobility, food, construction, and waste management (Einarsson & Sorin, 2020).

According to recent data, the travel and tourism industry accounts for around 8% of global greenhouse gas emissions (Lenzen, et al., 2018). To lessen such adverse effects on the environment, sustainable tourism development is defined as tourism that considers all present and future economic, social, and environmental implications, while also meeting the needs of visitors, the destination, and host communities (UNWTO, 2005). Circular tourism is a new potential approach for attaining long-term and equitable growth in this service-based yet resource-dependent industry, which can benefit from physical asset reconfiguration, circular design, and system thinking (Manniche, Larsen, & Broegaard, 2021).

The hospitality industry comprises businesses that provide food, drink, and accommodation services and represents a pillar of the broader travel and tourism context (Lashley, 2001). Once tourists arrive at their destination, they usually stay in a hotel, which consumes a large amount of energy and water and generates significant waste, particularly due to the more hedonistic services provided, such as breakfast buffets and single-use toiletries (Legrand, Chen, & Laeis, 2023). To run a hospitality business sustainably, it is crucial to focus on energy, waste, water, food and drinks, as well as building materials and furnishings. These areas have a high negative environmental impact, which can be mitigated by adopting a circular economy model (2023). Additionally, selecting suppliers carefully and building a cooperative network between hospitality businesses, the local community, and guests can promote circularity benefits more widely (Florido, Jacob, & Payeras, 2019).

It is believed that a transition system, such as circular economy, should be gradually applied to all sectors and that niches are important spaces for the formation of technological and social developments and to impulse systemic change (Geels, 2002). Therefore, the focus of this study gradually narrows to the application of circular economy to a niche of the hospitality industry, analyzing circularity in hostels.

Over the last decade, the hosteling sector has undergone significant changes in line with the evolution of its target audience. Initially, hostels were mainly known as budget accommodations featuring dormitories (Veríssimo & Costa, 2019). However, they have evolved into multicultural and experiential environments in which clients can choose the right balance between sociability and privacy. Both options of shared rooms and private lodgings are generally provided for travelers to opt for the solution that is most appropriate for their needs (Rashid-Radhaa, Lockwood, & Nolan-Davis, 2016).

The young generation, to whom hostels primarily relate, has more travel opportunities than ever, but they are also becoming increasingly aware of the environmental impact of their adventures (Bureau Veritas, 2022). Recent research also indicates that this type of accommodation is a more sustainable option than hotels (2022). Moreover, the concept of hostels originated from the idea of sharing spaces and temporary living experiences. Therefore, it already aligns with circular economy principles.

After examining the current state of the circular economy and its relevance to the tourism industry and hospitality sector, this study shifts its focus to the potential implementation of circular economy practices specifically in the context of hostels. As part of the research project, six hostels were selected to illustrate the application of six key circular dimensions, as proposed by the Ellen MacArthur Foundation

4

within the ReSOLVE Framework, which are: Regenerate, Share, Optimize, Loop, Virtualize, and Exchange (Ellen MacArthur Foundation, 2015).

Subcategories have been considered for each dimension, and additionally, revisions have been made to adapt the original framework to the current analysis. The purpose of this process was the comprehensive assessment of circularity applied to hostels, highlighting innovative approaches and identifying existing gaps, to determine strategies to foster the circular economy transition within the hosteling industry.

Chapter 1: The Circular Economy

The purpose of this chapter is to delve into the core components of the circular economy (CE) concept, exploring its origins and illustrating its evolution, in order to gain a better understanding of this paradigm and determine which factors must be taken into account for it to be implemented in a long-term sustainable framework.

1.1 Concepts and potential comprehensive definition

According to Bompan[1] while circular economy is a relatively recent term, its roots lie in a century of intellectual reflection (Che cosa è l'economia circolare, 2021). Nonetheless, this concept has not yet developed a general theory or a clear model with a shared definition. (Bompan, 2019). Circular economy caught the attention of many researchers, who analyzed its primary definitions to determine the extent to which the field has reached a consensus conceptualization (Kirchherr, Yang, Schulze-Spuntrup, Heerink, & Hartley, 2023). The study's findings highlight how the establishment of a common understanding of CE may never occur, and it is a widely held opinion that the concept cannot be contained in an oversimplified definition and must be analyzed in its complexity (Kirchherr et al. 2023); (Bompan & Brambilla, 2021). This is due primarily to the multidisciplinary and cross-sectoral nature of CE, which determines the coexistence of multiple operational and organizing principles (Sauvé, Bernard, & Sloan, 2016); (Manniche, Larsen, & Brandt , 2017). Moreover, the development of a sustainable and efficient CE comprehends so many

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[1] Bompan is an environmental journalist and the director of Renewable Matter magazine, which focuses on the transition to a circular economy (Bompan E. , 2013) ; (Renewable Matter, s.d.).

interrelated elements, which lead not only to a difficult exemplification but also application. The transition to a more circular economy requires systemic and widespread change, asks for a shift in sector composition and for new value-creation models, and ultimately redefines the way we think of the economy (Ellen MacArthur Foundation, 2015)[2].

According to some sources, circular industrial economy (CIE) refers to the management of industrial goods stocks to preserve their value and usefulness as long as possible (Stahel W. , 2019). This industrial and manufacturing focused perspective is relevant since the most impactful consequence of the linear economy is that "finite resources are extracted to make products that are used, generally not to their full potential, and then thrown away" (Ellen MacArthur Foundation, 2019). As a result of the large material resource flows required in the manufacturing industry, many academics are focusing on CE as a strategy to reduce resource consumption, pollution, and waste throughout the product's life cycle (Stahel W. , 2019); (Sauvé, Bernard, & Sloan, 2016); (Preston, 2012) (Hislop & Hill, 2011).

On the other hand, the Ellen Macarthur Foundation (EMF) provides a wider definition of CE that goes beyond the traditional industrial strategy. It considers its systemic approach and better resonates with the project presented in this dissertation, which is related to both material and intangible aspects that characterize the hospitality industry. Therefore, the definition of circular economy that best fits the insights here provided is the following:

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[2] The Ellen Macarthur Foundation (EMF) is the main non-profit organization dedicated to advancing the application of CE worldwide and in every aspect of the economy. EMF gathers with businesses, academics, and policymakers to fulfill its mission, collects case studies and research papers, and provides annual reports to keep track of CE state of the art (Ellen MacArthur Foundation).

"A circular economy is a systemic approach to economic development designed to benefit businesses, society, and the environment. In contrast to the 'take-make-waste' linear model, a circular economy is regenerative by design and aims to gradually decouple growth from the consumption of finite resources." (Ellen MacArthur Foundation, 2019).

Charonis endorses the Foundation's vision of CE as a restorative and regenerative paradigm, which offers the possibility of an "alternative growth discourse" rather than an "alternative discourse to economic growth" (Charonis, 2021, p. 80). This perspective on the economy signifies a substantial shift in approach. According to Meadows, systemic thinking serves as a method to identify fundamental causes of related issues and to discern new opportunities (Thinking in Systems, 2008). This aligns precisely with the core objective of the circular economy: prioritizing positive environmental impact over merely minimizing negative effects. It emphasizes not only the reduction of adverse impacts but it also enhances durability, fostering regeneration. This concept is best captured and exemplified by Stahel's[3] words: "don't repair what is not broken, don't remanufacture what can be repaired, don't recycle what can be remanufactured" (Stahel W. , 2013, p. 4).

The upcoming paragraph will outline the fundamental reasons behind the pivotal shift from a linear to a circular economy. This will involve a

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[3] The architect Walter R. Stahel is regarded as a pioneer of the circular economy. In 1976, together with economist and sociologist Geneviève Reday-Mulvey, he created the report "The Potential for Substituting Manpower for Energy" for the European Commission. The paper compared resource waste associated with the decommissioning versus the repair of goods and products. Their research intended to find solutions to extend the life cycle of buildings and other products to minimize waste. The findings were also published in 1981 in the paper "Jobs for Tomorrow: The Potential for Substituting Manpower for Energy" where the "cyclical" economy was proposed for the first time (Bompan & Brambilla, 2021). Stahel is now the author of several publications on the subject and actively promotes CE through workshops, seminars, and policy groups (European Union, 2019).

deeper exploration of the distinctions between the linear 'take-make-waste' model and the circular model, emphasizing its key features. The aforementioned considerations led to the conclusion that the circular economy is better defined by its features and evolution rather than by attempting to provide a widely agreed-upon description of the concept (Ekins, et al., 2019). Hence, using (Ellen MacArthur Foundation, 2019) definition as a point of departure, the thesis will analyze CE in its specificity, gradually narrowing the focus to the hospitality industry application and finally, to hostels, the project's core theme.

1.2 From a linear to a circular economic model

"Consider this: all the ants on the planet, taken together, have a biomass greater than that of humans. Ants have been incredibly industrious for millions of years. Yet their productiveness nourishes plants, animals, and soil. Human industry has been in full swing for little over a century, yet it has brought about a decline in almost every ecosystem on the planet. Nature doesn't have a design problem. People do." (McDonough & Braungart, 2002, p. 12)[4]

The quotation above presents climate change as a man-made design failure. Anthropogenic greenhouse gases in the atmosphere have been disrupting the natural carbon cycle, leading airborne carbon to be "a material in the wrong place, at the wrong dose, and for the wrong

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[4] McDonough and Braungart are considered CE pioneers, with the "Cradle to Cradle" approach being one of their most significant contributions. In "Cradle to Cradle: Remaking the Way We Make Things", the authors combine design and science to propose regenerative economic systems that eliminate the concept of waste (2002). "Cradle to cradle" is inspired by nature's cycles, in which everything becomes a nutrient for something else. By mimicking this life flow, human designs can create buildings, communities, and systems that do not perturbate the environment. The aim is not only to minimize negative influences but also to leave a positive ecological footprint (McDonough & Braungart, 2003). Park 20|20 is an example of a certified Cradle-to-Cradle urban development initiative. Located in Hoofddorp, Netherlands, it features buildings with modular designs for easy disassembly and a closed-loop system for waste, energy, and water (Pineo, 2022).

duration" (McDonough W. , 2016, p. 1). To tackle the rise in the concentrations of greenhouse gases in the atmosphere, it would be necessary to permanently reduce emissions by roughly 90%, assuming that 10% is absorbed (Ronchi, 2021), and considering the European Union's goal of achieving climate neutrality by 2050 as part of the Sustainable Development Goals action plan (European Commission, 2021). Combating climate change and the related environmental crisis has become an imperative worldwide, as recognized by the United Nations Organization, with the 17 Sustainable Development Goals at the heart of the 2030 Agenda for Sustainable Development (SD), which was adopted by all United Nations Member States in 2015 (World Tourism Organization, 2017). According to The Global Risks Report, the top five most severe risks over the long term (10 years) are all related to the environment. These risks include failure to both mitigate and adapt to climate change, natural disasters, extreme weather events, biodiversity loss, and ecosystem collapse (World Economic Forum, 2023). According to the "Economic Losses, Poverty, and Disasters" report, climate-related calamity accounted for 91% of the approximately 7,200 major catastrophic events recorded in the twenty years from 1998 to 2017 (United Nations Office for Disaster Risk Reduction; Centre for Research on the Epidemiology of Disasters, 2018). From an economic standpoint, over 100 billion tons of raw materials were consumed in 2021 to generate goods and services, and over fifty percent of this massive volume of materials was used to produce non-lasting items (Circular Economy Network, 2022). Considering these concerning data and estimates, there is an urgent need for a further distance from the linearity of our economic system.

Pearce and Turner were among the first to fully describe the need for a new and different economic concept (1990). They refer to Boulding's metaphor of planet Earth as a 'spaceship' in the book "Economics of Natural Resources and the Environment"; if a spaceship has a long

10

journey ahead and a stock of resources for the livelihood of those inside, the supplies will run out at some point, limiting the lifespan of spacemen unless they find ways to recycle and regenerate those materials (Boulding, 1966). Pearce and Turner begin explaining the required circularity from this representation of the earth's closed economic system. They ground their theory in thermodynamic laws: the first law asserts that neither energy nor matter can be created or destroyed, signifying that natural resources eventually become solid waste or emissions. Nevertheless, according to the second law, the system's boundaries are flexible, and non-exhaustible materials can be recovered and transformed back into natural resources (Pearce & Turner, 1990). These studies represent an initial understanding of the necessary transformation of the linear economy key model that has prevailed since the Industrial Revolution. This conventional model is commonly known as the take-make-dispose economy: "take the resources you need, make the goods to be sold and make profit, and dispose of everything you do not need, including a product at the end of its lifecycle" (Furkan, 2017, p. 32).

If recognition of the various ways in which we, as humans, are destroying the planet is not enough of a reason, it is also possible to look at the fact that the actual economic system is unsustainable from a financial standpoint. The scarcity of resources leads to a rise in prices for their provision, and the global supply chain is not resilient enough to withstand major challenges posed by pandemics, climate crises, large-scale wars, natural disasters and intense political tensions. This can result in an unsustainable cost increase of primary commodities. Moreover, the consequences of this crisis are more severe in some regions, where instability is intensified[5] (Grynspan, 2022) ; (Bompan

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[5] Since around 2012, there has been an increase in war scenes. The 2011 Arab uprising prompted conflict in Libya, Syria, and Yemen. Libya's instability expanded southward, exacerbating the crisis in the Sahel region. Other major conflicts followed,

& Brambilla, 2021). The Report "Towards the Circular Economy" published in 2013 (Ellen MacArthur Foundation, 2013) was already assessing the increasing risk alert of many companies noticing the volatility and consequent crisis of the linear system, and the following disruptive years confirmed their concerns.

In contrast to the unilaterality of the take-make-waste pattern, the circular economy system is also defined as an open circle, and it creates value through continuous cascades of related activities and resource flows, ensuring that a specific direction of the system is no longer visible, as in a linear economic model (Manniche, Larsen, & Brandt , 2017). The vision of a circular society, as articulated by Stahel, is one that "aims to maintain the value and usefulness, quality and quantity of all stocks of capital and assets of natural, human, manufacturing or financial type" (Stahel W. , 2019).

1.3 Key elements and principles for a circular economy

In the following section, using renowned models and principles from the field of CE, it will be possible to examine the features of the circular

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including fighting in northern Ethiopia and, more recently, Russia's 2022 invasion of Ukraine and the devastation in Sudan and Gaza (Ero & Atwood R., 2024). Climate change and rising commodity prices on global markets have aggravated various conflicts and 90% of the world's refugees come from countries impacted by the climate crisis and have limited capacity to adapt to environmental hostility (Levi Meir, 2022). Sudan's civil war, for example, has been referred to as a climate change-induced conflict, due to water scarcity after changed rainfall patterns in the Darfur region (2022). Several studies additionally link climate change to the Syrian civil war, referring to how the authorities' mishandling of the severe drought in the years prior may have contributed to the population's discontent with the government (Climate Diplomacy, s.d.). Moreover, Ukraine and Russia are two of the world's largest exporters of agricultural commodities such as wheat and fertilizer. This is driving up market prices and will have a significant impact on areas reliant on imported food, such as the Sahel (Levi Meir, 2022).

economy that differentiate it from the linear nature of the current economic model.

The butterfly diagram, created by the EMF (Circular economy systems diagram, 2019); (Figure 1) and inspired by the "Cradle to Cradle" design concept, represents the continuous flow of materials that characterizes the circular economy, in which a product is thought and created to ensure it does not produce waste and can be repurposed in an economic loop (Braungart & McDonough, 2002).
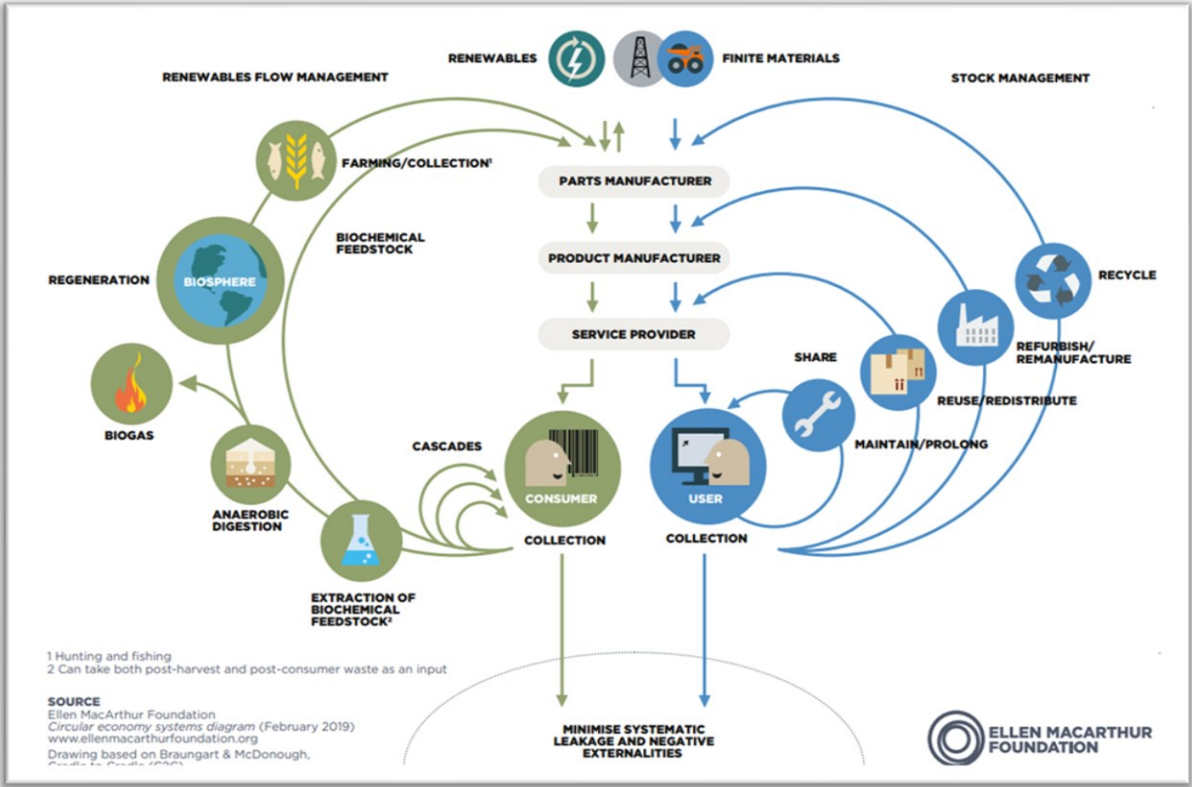
Figure 1: Circular economy systems diagram, (Ellen MacArthur Foundation 2019)

The diagram is composed of two cycles:

The technical cycle: to maintain products and materials in use, cyclical strategies such as reuse, repair, remanufacture and recycling are employed. These processes are represented by the right side of the butterfly in the diagram. The value of items is retained most effectively in the inner loops, such as for sharing and maintenance actions. The outer loops, with recycling as the last option, provide less value to the product because they already focus on how to properly dispose of it (Ellen MacArthur Foundation, 2017). *Blablacar* is an example of sharing economy service

Figure 2: The technical cycle of the butterfly diagram, (Ellen MacArthur Foundation 2019)

that can be placed under the technical cycle section of the diagram, because an asset, in this case a car, is shared with private individuals to maximize its utility (BlaBlaCar, 2016)[6].

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[6] BlaBlaCar is a digital platform that connects drivers who have empty seats in their vehicles with passengers who are traveling in the same direction. It represents one of the most successful peer systems for optimizing wasted capacity by allowing on-the-road car seats to be sold to strangers in need of a ride. The company now offers both carpooling and long-distance bus transportation. It all started over Christmas 2003, when the inventor, Frédéric Mazzella, was a student at Stanford and found himself in need of a ride from a stranger since he didn't have a car and trains were fully booked. He assumed he would find a website where he could share gas costs in exchange for the use of an empty seat, but he couldn't find any, despite noticing lots of people driving who could have benefited from such a service, as well as him. He created a platform to meet this market demand and scaled up the startup with co-founders Francis Nappez and Nicolas Brusson (BlaBlaCar, s.d.); (BlaBlaCar, 2016)

The biological cycle: it includes biodegradable materials that naturally decompose and replenish the soil. These organic processes can be implemented in product cascades to create new value from what is seemingly waste (Ellen MacArthur Foundation, 2017). *Coffeefrom*, an Italian startup that produces coffee cups out of coffee scraps, is an example of how a biological cycle can be applied to create a novel item[7] (Coffeefrom, 2023).
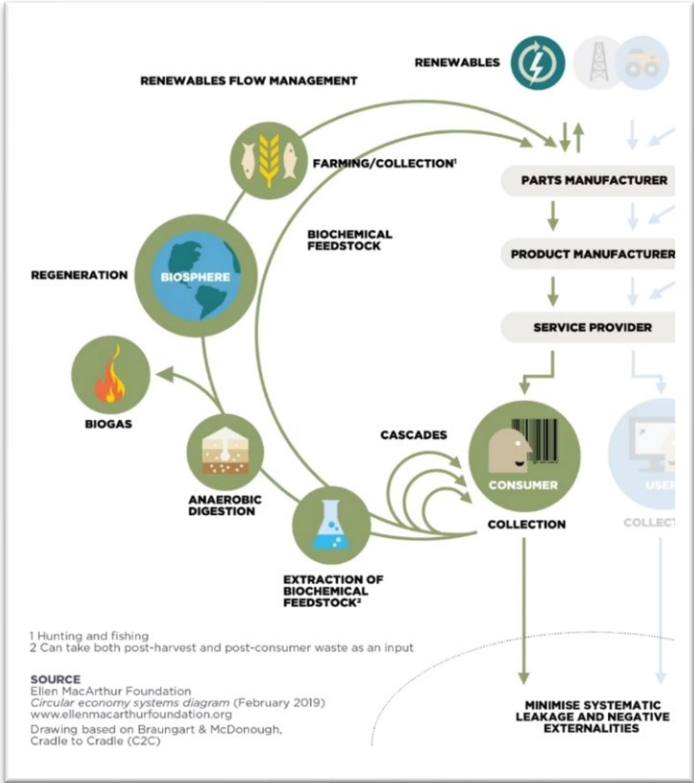
Figure 3: The biological cycle of the butterfly diagram, (Ellen MacArthur Foundation 2019)

The Butterfly Diagram may also be employed to explore how the two different cycles, biological and technical, create value in the circular economy by adhering to three main principles, which the Ellen McArthur Foundation believes should form the foundation of a CE business model: eliminate waste and pollution, circulate products and materials and regenerate nature.

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[7] Coffeefrom is a social impact startup that creates thermoplastic materials from coffee waste collected as a byproduct in the food sector. The company employs vulnerable workers in logistic and packaging activities and is a good example of CE for the innovative application of industrial symbiosis, combining environmental, social, design, and industrial expertise. Coffeefrom evolved as a spin-off of "Il Giardinone" social enterprise. The parent company took a first approach to CE business models while participating in Expo 2015 in partnership with Lavazza, Novamont, and the Polytechnic of Turin with Fungo Box: a self-production kit for cultivating mushrooms from coffee waste. The acquired know-how was then applied to implement the project of Coffeefrom (Coffeefrom, 2023).

1.3.1   Eliminate waste and pollution

This principle optimizes the efficiency of the economic system by designing out waste from the equation. "There is no waste in nature, it is a concept we have introduced" (Ellen Macarthur Foundation, 2019). Waste is a design choice; circularity begins with the selection of renewable processes and technologies and the support of a circular business model that allows the linear economy's 'end-of-life' idea to be replaced with regeneration (Ellen MacArthur Foundation, 2015). The adjustment in vision demanded by this principle opens up opportunities for innovative thinking and even "delivering utility virtually, whenever optimal." (Growth Within: a circular economy vision for a competitive Europe, 2015, p. 5). This is how Spotify became a new way to listen to music digitally, but it also incorporates Stahel's theory of performance economy, which the author defines as the most sustainable business model of the circular economy that sells performance, objects, and molecules as a service and is thus also known as "product as a service" (Stahel W. , 2019). The cleverness of this strategy rests on shifting the attention to the result rather than the selling of the good itself. The economic actors retain ownership of the product, hence wider control over its life cycle (including maintenance, reuse, regeneration, disposal, etc.), and are therefore motivated to maximize its value (Kjaer, Pagoropoulos, Schmidt, & McAloone, 2016). Performance economy is a part of everyday life when we share a bus or train with other passengers, as well as when we book a hotel room or rent a car.

1.3.2   Circulate products and materials

For the previously described principle to be observed, a closed-loop system for both the technological and biological cycles depicted in the Butterfly Diagram must function to "keep products, components, and materials circulating in the economy." (Ellen MacArthur Foundation, 2019) . If this is a natural process for the biological cycle, the circularity

16

must be built into the technical cycle. The main actions that may be taken to integrate CE into the two cycles are represented by a simple yet effective strategy that was first proposed by the Japanese government: the 3R actions Reduce, Reuse, and Recycle (3R Initiative, 2004) which have become extensively adopted as follows:

- Reduction refers to enhancing production efficiency by minimizing the amount of energy and raw materials used. The activity is also accessible to consumers who live a simpler lifestyle and are concerned about their environmental impact. (Su, Heshmati, Geng, & Yu, 2013);
- Reuse entails employing assets to their maximum potential through maintenance and restoration and even recognizing what is considered waste for a company as resources for others (2013). In their research, Castellani et al. assess how reusing products involves fewer resources, less energy, and less labor than manufacturing a new one from raw materials, recycling, or disposal. (Castellani , Sala, & Mirabella, 2015).
- Recycle involves the regeneration of renewable resources after their usage (Jiang & Zhou, 2012). "Large amounts of embedded energy and work force are lost" (Ellen MacArthur Foundation, 2013, p. 7) in the procedure of recycling to recover material and reprocess it into its original form or other items. If the first principle of CE is applied, waste is designed out from the beginning and the outer loop of recycling is not a necessary option.

1.3.3 Regenerate nature

This notion involves not only material recovery, value retention, and the transition to renewable energy, but also the preservation of ecosystem health and the improvement of life quality through an economic model based on the natural world (Ellen MacArthur

Foundation, 2015); (Ghisellini, Cialani, & Ulgiati, 2015). The concept of regeneration is embedded in the system of industrial ecology (IE), which acknowledges that "many biological ecosystems are especially effective at recycling resources and thus are held out as exemplars for efficient cycling of materials and energy in industry" (Ayres & Ayres, 2002, p. 3). This imitation of the living systems of IE aims to find a circular answer for our economic system. While it is undeniable that the planet will always establish a new equilibrium, the question is whether this process will allow humankind to survive (Bompan & Brambilla, 2021). In other words, regeneration is a viable choice for nature, and humans should learn more about it, support it, and employ it. The second goal of industrial ecology is to perceive economic systems as symbiotic and collaborative with nature (Ayres & Ayres, 2002) ; (Frosch & Gallopoulos, 1989). This view of industrial ecology contributed to the development of the CE systemic approach, which, as indicated in the following paragraph, is one of the distinguishing features of the process that led from sustainable development to the circular economy concept.

1.4 Circular economy and the evolution of sustainable development

Reflecting on previous discussions within this chapter, defining the circular economy proves challenging, leading to insufficient evidence to pinpoint its pioneers. However, its evolution can be traced through several contributors (Winans, Kendall, & Deng, 2017). Additionally, CE is part of the broader concept of sustainable development (SD), as highlighted in the previously cited Kirchherr et al. study, where SD appears in one out of three definitions of CE (Conceptualizing the Circular Economy, Revisited, 2023).

The definition of sustainable development was first given in 1987 in the Brundtland Report (World Commission on Environment and Development: Our Common Future) commissioned by the General Assembly of the United Nations, where it was explained as: "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987). Hence, SD refers to a form of progress in which resources, investments, technical advancement, and institutional decisions are made while considering not only current but also future needs (1987). The report highlighted the growth of a global debate that began in Stockholm in 1972 during the first UN organized world conference focusing on the impact of human socioeconomic activities on the environment (UN General Assembly, 1972).

Twenty years after that Conference, a new international summit was held in Rio de Janeiro to address related principles, legal tools and specific actions to implement the concept of SD as defined by the Brundtland report. Focusing on the interdependent nature of the three primary pillars of sustainable development: social, economic, and environmental, the summit emphasized the necessity for these pillars to evolve in tandem to ensure progress where "Human beings are at the center of concerns for sustainable development. They are entitled to a healthy and productive life in harmony with nature" (United Nations, 1992, p. 1).

Before any of these conferences took place, the roots of circular economy had already been laid at the beginning of the environmental movement, in the 1950s and 1970s (Ekins, et al., 2019). In 1950, Von Bertanlaff's General Systems Theory stated that all organisms are systems interlinked through their components, providing the groundwork for some of CE's key concepts such as "system thinking, complexity, organizational learning, and human resource development"

(Ghisellini, Cialani, & Ulgiati, 2015, p. 5). The spaceship earth metaphor suggested by Boulding (1966) represented the first essential description of the "need to contemplate Earth as a closed economic system: one in which the economy and environment are not characterized by linear interlinkages, but by a circular relationship. Everything is an input into everything else." (Pearce & Turner, 1990, p. 37). As a result, despite the time it required for its input to become an established economic notion, Boulding provided most of the insights on which CE thinking is currently built in a short study (Ekins, et al., 2019). Industrial ecology is another theory introduced by environmental researchers in the 1970s (Preston, 2012), and certain concepts from the first world summit on the human environment in Stockholm were already embracing the ideas behind it (Clift & Druckman, 2016). It took another 30 years for IE to be formally recognized as a field of study and defined as a way to transform "the traditional model of industrial activity (…) into a more integrated model: an industrial ecosystem. In such a system the consumption of energy and materials is optimized, waste generation is minimized and the effluents of one process (…) serve as the raw material for another process" (Frosch & Gallopoulos, 1989, p. 144). Additionally, for this course of actions to occur: "The industrial ecosystem would function as an analogue of biological ecosystems" (Strategies for manufacturing, 1989, p. 144). Therefore, IE responds to Boulding's proposal to develop a circular economy by adopting the systemic approach introduced by the General Systems Theory, using nature as a model, and proposing strategies to create closed circular processes and eliminate the concept of waste (Ayres & Ayres, 2002).

In the 2000s, more recent theories on CE have been mainly attributed to contributors mentioned earlier in this chapter. Walter R. Stahel, the founder of Europe's oldest sustainability consultancy, the Product-Life Institute, was the first to adopt the expression "cradle to cradle" in the

20

1980s (The Product-Life Institute, 2013). Subsequently, McDonough and Braungart further developed this concept into a theory that is presently utilized in product certification (Cradle to Cradle Products Innovation Institute, 2023). The authors emphasized that environmentalists formerly focused on aspects such as conservation, reduction, and degrowth. However, these were not embraced by the linear economic system, which is primarily profit-oriented and driven by objectives contrary to these environmental goals (Cradle to cradle: Remaking the way we make things, 2002). Eco-efficiency aims to minimize material flows within the cradle-to-grave dynamic, involving suboptimal methods such as recycling and downcycling[8] (Ellen MacArthur Foundation, 2013). McDonough and Braungart challenge the concept of 'eco-effectiveness' to that of 'eco-efficiency': "the goal is not to minimize the cradle-to-grave flow of materials, but to generate cyclical, cradle-to-cradle 'metabolisms' that enable materials to maintain their status as resources and accumulate intelligence over time (upcycling)" (2013, p. 23). The Butterfly Diagram, which facilitates understanding of some of the most prevalent forms in which a CE can occur, represents the outcome of this shift in thought. The EMF, which created the model in question, is recognized for offering global support for the advancement of further CE theories such as regenerative design[9], the previously stated performance economy, biomimicry[10], and blue economy[11] (Ghisellini, Cialani, & Ulgiati, 2015).

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[8] Downcycling: downgrade in material quality which limits usability (Ellen MacArthur Foundation, 2013)
[9] Regenerative Design: "Processes within all systems must renew or regenerate the sources of energy and materials that they consume, in order to stay within the limits of nature." (Manniche, Larsen, & Brandt , 2017, p. 17)
[10] Biomimicry: "Inspired by nature, this approach tries to imitate nature's designs and processes to find solutions in human society." (2017, p. 17)
[11] Blue Economy: "Blue economy gains knowledge from the way in which organisms are formed and stresses that the purpose of finding solutions for the challenges that we face should be determined by their local environment combined with their physical or ecological characteristics." (2017, p. 17)

The circular economy goes beyond solely urging the use of green and environmentally friendly technology in isolated production systems (Manniche, Larsen, & Brandt , 2017). As previously mentioned, CE transition requires systemic and widespread change (Ellen MacArthur Foundation, 2015). To achieve it, just balancing the effects of individual decisions made in accordance with the three pillars of sustainable development —people, planet, and profit— is insufficient (Melissen & Sauer, 2019). Such an approach is likely to result in a slow process with suboptimal results, while ignoring the systematicity of the change (2019). John Elkington – known for devising the triple bottom line sustainability method that evaluates a company's impact across social, environmental, and economic dimensions – acknowledged the insufficiency of any sustainable economic frameworks unless they operate at an adequate pace and scale to counterbalance the impact of human actions on our planet (Harvard Business Review, 2018). Sauvé et Al. addressed the relationship between CE and SD concepts. Their research explores how some environmental specialists interpret sustainable development as a succession of efforts conducted within a linear thinking, therefore considering them as two inextricable concepts (Sauvé, Bernard, & Sloan, 2016). They proceed further to state that, according to other experts, SD proves to be a failure when applied to linear economy. However, the same embrace circular economy as a tool for sustainable development, resulting in improved results. The authors underline that their objective is to look at the parallels and discrepancies between the two concepts rather than to assert that one is undoubtedly better than the other. Nonetheless, they conclude that CE is gaining recognition because it offers an effective approach to addressing environmental issues (2016). The fact that CE has been shown to have better outcomes than comparable economic systems, as indicated by research such as the one described above, does not suggest that the paradigm is salvific in itself or that it must become an ideology (Bompan & Brambilla, 2021). It is appealing

22

because, in comparison to other emerging models, circular economy attempts to incorporate all relevant components covering market, regeneration, worker welfare, and ultimately, the overall non-linear impact (2021).

1.5 Towards a circular economy framework: policies in action

"Since the economic and societal institutions coevolve with and shape transformations, they play a significant role as both a structural feature and an agency of change" (Henrysson & Nuur, 2021, p. 4). Academic interest among researchers regarding the institution's role in facilitating the transition to a CE as indicated in the aforementioned statement, underscores an ongoing development of frameworks, recognizing the pivotal role of policies in this transformative process (Genovese, Acquaye, Figueroa, & Lenny Koh, 2015) ; (Vanner & Bicket, 2014). The values that shape society and the political system, as well as logic, preferences, and even actions, are influenced by existing institutional frameworks (Vatn, 2020). The function of governance is particularly crucial for circular economy development since it involves various and interconnected industries, thus regulations must be coordinated from a multi-level perspective (Ellen MacArthur Foundation, 2021). The European Environment Agency recognized the institutional difficulty of developing cross-sectoral policies as the greatest barrier to CE transition for 32 European countries in 2019 (European Environment Agency, 2019). Italy, where this dissertation is primarily written, demonstrates the challenge of spreading innovation, collaboration, and best practices beyond the industry in which they were developed through the history of its industrial districts (ID). The establishment of ID, which were recognized by law in 1991 as local territories characterized by a high concentration of primarily small enterprises (in comparison to the resident population) with product

specialization[12], has been a critical component of Italian local industrial development. They are hubs of technical know-how and entrepreneurial mindset that foster creativity and collaboration among various firms with similar goals in order to make their production chains run efficiently at various levels. When compared to Alfred Marshall's original vision of ID in the south of England in the early 1900s, which included multi-sectoriality (Marshall, 1920), Italian districts are usually constrained to a certain industry. The spontaneous entrepreneurial partnerships and various expertise that consequently emerged in Italy proved to be highly profitable. Industrial districts also appear to be ideal for experimenting with the circular economy. This is what is happening in Tuscany, where a project has been proposed as part of the Regional Plan for the CE to transform the industrial areas of Rosignano, Marittimo, and Pontedera into three circular districts to recover waste that cannot be mechanically recycled and produce polymers, chemical goods, hydrogen, and low-carbon fuels (Green Report, 2022). For as many positive results as an industrial district can achieve, as cited above, there is a greater academic interest in studying an implemented version of this concept known as industrial symbiosis (IS). In fact, the very specialization that made the industrial district system effective may limit its potential for expansion beyond a certain sector. IS is the process by which industrial ecology, as envisioned by Frosh and Ayres and previously outlined in this thesis, allows the economy to be considered as a series of linked ecosystems, resulting from the interaction of diverse enterprises and industry clusters. When IS occurs, one company's waste becomes a resource for another. This process allows to lower the costs of supplying and disposing of resources and creates new cross-market opportunities (Circularity S.R.L, 2022). The textile district of Prato, located again in Tuscany, represents an excellent case study of both industrial symbiosis in the

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[12] Law No. 317 of 5 October 1991, Article 36(1) (Istituto Poligrafico e Zecca dello Stato, s.d.).

24

Italian circular economy and the obstacles that may occur if it is not adequately supported by regulation. A symbiosis system has been designed to treat 34,000 tons of textile waste annually, reusing at least 94% of the total. This cutting-edge technology, which is now in the development stages, has been delayed significantly due to a law restriction that classified certain production remnants as waste and restricted their upcycling (Bolelli, 2022). The so-called 'Pact for Textiles', which was later established between the Region and the Textile District to resolve this and similar bureaucratic conflicts, has allowed legislation on the subject to be compatible with European textile waste regulations (Bini, 2020).

For IS to occur and serve as a means for widespread and multi-sectoral transition to the CE, vertical and horizontal cooperation among governance systems is required. There are various policies now in place for this multifunctional integration to take place. In 2015, the European Commission introduced the first Circular Economy Action Plan, a pioneering initiative aimed at increasing global competitiveness, promoting sustainable economic growth, and contributing to employment opportunities (EU Directorate-General for Environment, 2020). The United Nations 2030 Agenda for Sustainable Development was adopted by all member nations in that same year, with 17 Sustainable Development Goals (SDGs), addressing the three pillars of SD (United Nations, 2015). By tackling root causes, the circular economy holds distinctive prospects for meeting numerous SDGs, including energy, economic growth, sustainable cities, consumption and production, and climate change (United Nations, 2018). The European Union translated into the European Green Deal the policy required to deliver on the SDGs, achieve climate neutrality by 2050, and meet the other obligations signed under the 2015 Paris Agreement (European Council, 2023). CE is a key component of the European Green Deal (2023). The Circular Economy Action Plan, carried out in

the same year, serves as a sustainable policy framework for products and emphasizes the need for international and global action (European Commission, 2023). The linked regulations implemented by the United Nations and the European Commission are examples of how alignment around the systematicity of the transition can reduce the risk of isolated CE measures remaining embedded in a fundamentally linear economic structure (Ellen MacArthur Foundation, 2021).

When applying CE to a particular industry, such as tourism and hospitality, where this paradigm is in its early stages, the significance of inter-level collaboration becomes even more apparent (Manniche, Larsen, & Brandt , 2017), as will be explored in the following chapter. For the principles of CE to be implemented effectively on a wide scale, there needs to be a "bottom-up movement" (Stahel W. , 2016). A grassroots effort enables innovators to provide the economic and technical expertise to improve business models. Meanwhile, governments and authorities must adapt this process with compatible regulations and policies, including taxation and fund projects at local, regional, and interregional levels (2016) ; (European Commission, 2015).

Chapter 2: Exploring the Circular Economy in the Hospitality Industry

This section of the study examines the environmental impact of the travel and tourism industry and then explores sustainable development and circularity as significant implementations in this area, with a specific focus on the hospitality industry.

2.1 The Travel and Tourism Industry: overview and environmental impact

Despite occasional setbacks, the tourism industry grew steadily for the tenth consecutive year in 2019. During that time, the rise of international tourism receipts[13] (54%) outpaced global GDP growth (44%) (World Tourism Organization, 2021). Between 2014 and 2019, this sector contributed to one in every five new employments generated worldwide, totaling 334 million (World Travel & Tourism Council, 2023). 2019 was also a year of significant transformations in the Travel & Tourism environment, which included the decline of several low-cost airlines in Europe[14] (World Tourism Organization, 2021). This challenging time culminated in March 2020 with the outbreak of the COVID-19 pandemic, resulting in diffused confusion surrounding global travel restrictions and sanitary obligations, due to complex and incongruous legislation and measures and casting doubt on the

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[13] "International tourism receipts are expenditures by international inbound visitors, including payments to national carriers for international transport. These receipts include any other prepayment made for goods or services received in the destination country." (The World Bank, s.d.)

[14] In 2019, 23 carriers ceased operations, which made it an unprecedented year for airline decline. Thomas Cook, the UK's third-largest tour operator, went bankrupt, leading to the closure of its airline operation as well. Other smaller companies, such as Flybmi and WOW Air, have followed suit (Coffey, 2019). The month of November 2019 suffered the lowest monthly performance on European flights since January 2015 (Eurocontrol, 2019).

industry's future (Pernice & Debyser, 2023). The ensuing health and economic crises had an array of impacts on our lives, including changes in socialization and consumption habits, work and leisure agendas, mobility limitations, and many other aspects of humanity (Romagosa, 2020). Tourism was among the most impacted sectors due to COVID-19; however, recent data shows a robust recovery, with Europe reaching 90% of pre-pandemic levels in early 2023, propelled by intra-regional demand (World Tourism Organization, 2023). The relatively rapid rebound, verified during the second quarter of 2023 despite strong inflation and increased travel expenses, has developed throughout the post-pandemic years (European Travel Commission, 2023), as evidenced by the following additional figures. In 2022, the travel and tourism sector represented 7.6% of global GDP, a 22% rise from 2021 and just a 23% decrease from 2019 (World Travel & Tourism Council, 2023). According to the OECD, international tourist arrivals almost tripled during the period from January to July 2022, compared with the same period in 2021 (Tourism Trends and Policies, 2022). The crisis scenario faced by tourism during the pandemic highlighted the need for resilient business models and viable growth (Romagosa, 2020). Some researchers have analyzed the pandemic-induced pause as an opportunity for the tourism industry to reorient towards a more sustainable and conscious development (Higgins-Desbiolles , 2020) ; (Hall, Scott, & Gössling, 2020); (Ateljevic, 2020).

"While COVID-19 has been the worst crisis in the history of tourism, rebuilding the industry represents an opportunity to incorporate circular economic principles in a systematic and holistic way across the whole tourism value chain" (Committee on Environmental Policy, 2022, p. 5)

Due to its predominantly linear economic structure, the tourism industry is recognized as a significant contributor to climate change

(López del Pino, & Martínez Cabrera, 2021). It is composed of several interconnected supply chains that resemble a spiderweb (Epler Wood, 2017) inextricably tied to various major industries such as mobility, food, construction, and waste management (Einarsson & Sorin, 2020). Research estimates that tourism's global carbon footprint accounts for about 8% of global greenhouse gas emissions (Lenzen, et al., 2018). The finding is four times higher than previous estimates, such as those of (World Tourism Organization and United Nations Environment Program, 2008) and (Peeters & Dubois, 2010) which did not include in their analysis the supply chains underpinning tourism. Between 2009 and 2013, Lenzen et al. analyzed traveler spending and activities in 160 countries. The most impactful aspects of their journey, contributing to higher CO_2 emissions and pollution, were related to travel, especially by airplane or car, and product and service consumption, such as food, accommodation, and shopping (Lenzen, et al., 2018).

If the primary contributor to greenhouse gas emissions is attributed to tourists traveling to their destination, it is also necessary to acknowledge that those same visitors may spend their vacation in a hotel[15] that accounts for high energy and water consumption (Melissen & Sauer, 2019). As a useful example to assess the environmental impact of these accommodations, Legrand et Al. analysis of the Cornell Hotel Sustainability Benchmarking Index[16] outlined that hotels in the

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[15] Hotels are a defining element of the hospitality industry, which in turn represents a central part of the travel and tourism sector. HI encompasses an array of service-oriented enterprises that provide lodging, food, and drinks, or a combination of those three primary services. Throughout this chapter, this industry will be used to provide examples and explain the tourism field in line with research objectives, while a more comprehensive (and in circular terms) analysis will be presented in the end paragraph.

[16] The Cornell Hotel Sustainability Benchmarking (CHSB) Index compares hotels' carbon, energy, and water performance, differentiating data across cities, regions of the world, and business categories. The database includes information from over 14,000 lodging establishments, and 20 international hotel brands and spans 55 countries (The World Tourism Organization, 2021).

United States have an average carbon footprint of 19 kg CO2e[17] and consume 473 liters of water per occupied room (Legrand, Chen, & Laeis, Sustainability in the Hospitality Industry, 2023). Waste generation is another major challenge for the Hospitality Industry (HI) (Sanaa & Hassan, 2014). This issue is well exemplified by the common practice of providing disposable, one-time-use toiletries to visitors at lodging facilities, often packaged in little plastic containers or wrapped into plastic (Legrand et Al. 2023). Furthermore, a review of waste management studies determined that food waste accounts for 40% of total refuse from hotels and 60% from restaurants (Sanaa & Hassan, 2014).

The traditional tourism system can have significant environmental impacts for various reasons, as outlined above, ranging from travelers' CO2 emissions to resource consumption for building construction and maintenance. In some destinations, these negative externalities are worsened due to the concentration of visitors, resulting from the area's particular attractiveness or the seasonality of the tourist activity (Florido, Jacob, & Payeras, 2019). Overtourism is a phenomenon that occurs when the impact of tourism exceeds "physical, ecological, social, economic, psychological, and/or political capacity thresholds" at certain times and specific locations (Peeters , et al., 2018, p. 15). The definition includes people's ability to handle crowding effects, governments' challenges in controlling the implications of fast tourism growth, and the impact on the quality of life in the affected host communities. Moreover, overtourism can be connected to new models of the industry originally developed with the opposite purpose of contrasting

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[17] CO2-e and CO2-eq are abbreviations for carbon dioxide equivalents. It is a metric used to compare greenhouse gas emissions by converting levels of other gases to an equal amount of carbon dioxide that has the same global warming impact (Eurostat, 2023). To put the data stated in the text into context, the kg CO2e of a hotel room occupied for 365 days is 6,935 which equates to 48,260 kilometers driven, 3,429 liters of gasoline consumed, and the production of 3,166 beef stakes (150g each) (CO2 Converter, s.d.).

traditional and unsustainable tourism. The sharing economy, also known as collaborative consumption, is a concept based on peer-to-peer activities that allow people to obtain, give, or share access to goods and services through community-based online services (Hamari, Sjöklint, & Ukkonen, 2015). There are some similarities between the circular economy and the sharing economy, but the former prioritizes environmental challenges while the latter focuses on societal implications (Henry, et al., 2021). A non-positive link analyzed by some researchers is that both notions have been criticized for having their sustainable aspects diminished by "exaggerated neoclassical and neoliberal interpretations" (2021, p. 1).

AIRBNB, a worldwide famous sharing platform providing travel accommodations, is considered a pioneer of the sharing economy in the tourism context. Airbnb's mission in 2018 was to "create a world where anyone can belong anywhere, providing healthy travel that is local, authentic, diverse, inclusive, and sustainable" (Airbnb, 2019, p. 2). Airbnb's model of sharing underused assets like rooms, apartments and houses has undoubtedly many positive aspects, including economic accessibility, more authentic experiences and opportunities for the hosting community to promote local culture (Prayag & Ozanne, 2018). However, the complexities of the Airbnb business model are becoming increasingly relevant, prompting numerous academic studies to examine its outcomes. Considering that most countries currently lack a specific legal framework for these new forms of hospitality, there is an uncontrolled growth of accommodation options in certain destinations, resulting in the "touristification"[18] of residential areas in

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[18] The term "touristification" describes the process of adaptation and consequent transformation of a destination as a result of tourism. Tourists' interests are prioritized over locals', and tourism is maximized to achieve the best outcomes and profit. The term has recently taken on a negative meaning due to how touristification can degrade an area on an environmental, social, and cultural level (Hernández & De la Calle-Vaquero, 2023).

cities (Peeters , et al., 2018); (Gutiérrez, García-Palomares, Romanillos, & Henar Salas-Olmedo, 2017). Real estate investors are increasingly renting out entire building blocks solely to accommodate the tourism sector (Barron, Kung, & Proserpio , 2020). This unhindered development is driving up property values and making it harder for locals to buy their own house or get long-term rentals or loans at affordable prices (2020).

The effects of the sharing economy on tourism shed light on how this industry is strictly linked to the long-term sustainability of the environmental, economic, and social dimensions of a destination. An idea to efficiently employ underused or unused resources that kicked off with an inflatable mattress in a living room (v.; AIRBNB) resulted in a disruptive system that spreads challenges across diverse interrelated contexts. The factors discussed in this paragraph may explain why academic research is necessary for lasting, innovative and sustainable development in the tourism industry. The next section will look at how tourism is currently evolving to take better account of its environmental and social impact with the emergence of the circular tourism.

Airbnb is a peer-to-peer short-term rental platform where suppliers (hosts) present accommodations to potential renters (guests). The lodgings available on Airbnb range from shared rooms to entire houses, including unique stays like tree houses and glamping tents. Today, Airbnb is one of the world's largest accommodation brands. The company was founded in 2008, and by 2017, it already had over a million hosts offering three million listings across 52 countries. In 2007, Brian Chesky and Joe Gebbia were struggling to pay the rent for their San Francisco apartment. They came up with the idea of hosting travelers in their home by providing air mattresses. At that time, there was an international design conference in San Francisco, which caused the hotels to be completely booked. The co-founders of Airbnb saw an opportunity and found a way to meet the demand. Initially, they named their service "Air Bed and Breakfast" (Leigh, 2017).

2.2 Sustainable Tourism Development and Circular Tourism

The World Tourism Organization (UNWTO)[19] defines sustainable tourism development (STD) as "tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitors, the industry, the environment and host communities" (UNWTO, 2005). This concept is an integral part of

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[19] The World Tourism Organization (UNWTO) is the United Nations agency responsible for the promotion of "responsible, sustainable and universally accessible tourism" worldwide. It is an intergovernmental organization with 160 Member States, six Associate Members, and more than 500 Affiliate Members. (The World Tourism Organization, s.d.)

the broader topic of sustainable development. Although the word "tourism" was only marginally mentioned in the Brundtland Report in 1987, at the time there were already an increasing number of publications on the environmental impacts of tourism, and the Report boosted research in this field as well (Telfer, 2012). One of the first contexts in which sustainable development was linked to tourism to initiate a more focused debate on the subject was the Globe International Conference on SD Technologies, which took place in Vancouver in 1990. STD was intended as "leading to the management of all resources in such a way that we can fulfill economic, social, and aesthetic needs while maintaining cultural integrity, essential ecological processes, biological diversity, and life support systems," with a focus on governments, international organizations, and the role of tourists in achieving this goal (Fennell & Cooper, 2020, p. 20). The tourism sector relies on the preservation and durability of natural and cultural resources that are an essential component of the tourist experience, and sustainable tourism was regarded as a holistic instrument for the responsible and continued use of such resources. Among the first concepts to link tourism and sustainability there was *Alternative Tourism* in the late 1980s, which promoted better awareness of environmental conditions, cultural traditions, and the urgency for reduced material consumption (Aall, 2014). Alternative tourism, as the name suggests, evolved as a different option to mass tourism, and it inspired other forms of sustainable travel such as ecotourism, fair trade tourism and green tourism (v.; Examples of sustainable tourism) (Fennell & Cooper, 2020). The discussions gradually reached a higher level of complexity to demonstrate the importance of more than independent trends, which are presumably more sustainable (Telfer, 2012). A new paradigm was required, along with methods for implementing sustainable development criteria into every form of tourism (2012). Despite the previously mentioned lack of focus on tourism in the UN Brundtland report of 1987, tourism was among the

34

first industries to carry out the recommendations of developing their sector-specific version of the "Sustainable Development Agenda 21" action plan published later in 1997 (Aall, 2014). Agenda 21 was an extensive strategy to be implemented in all areas where human activity impacts the environment, and 178 governments endorsed it in 1992 (United Nations Division for Sustainable Development , 1992). The Agenda 21 for Tourism provided the UNWTO's first proposals on sustainable tourism in collaboration with the World Travel & Tourism Council (WTTC)[20] and an international coalition of NGOs known as the Earth Council (Shu-Yuan, et al., 2018). The review that followed in 1999 revealed that the goal of making sustainable development a primary consideration in tourism had proven extremely difficult due to the industry's fragmentation and complexity (WTTC, 1999). In that same year, the UN Commission on Sustainable Development decided to carry out the discussion during the annual monitoring conference for Agenda 21. However, the summit ended up endorsing greater liberalization of international tourism in favor of the economic development of poorer nations without adequately considering the resulting increase in greenhouse gas emissions (Aall, 2014).

Moving forward, other international conferences on sustainable development continued to discuss this new dimension of tourism. Examples include the World Summit on Sustainable Development in Johannesburg in 2002 and the Cape Town Declaration on Responsible Tourism. Various critiques were leveled at the process of developing sustainable tourism in its early stages (Telfer, 2012). While fundamental issues such as poverty in developing nations, food security, and the consequences of industrialization and urbanization

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[20] The World Travel & Tourism Council (WTTC) is a non-profit membership-based organization comprising over 200 representatives from travel and tourism businesses worldwide. WTTC's main objectives are to foster economic development, generate employment opportunities, and improve security through tourism (WTTC, 2024).

were studied, the impact of tourism was overlooked. The tourism industry's business strategy hindered its sustainable development over the long term. Furthermore, there was a failure to promptly recognize climate change risks and take effective action against them (Swarbooke, 2023). It wasn't until 2005, when "Making Tourism More Sustainable: A Guide for Policy Makers" was published, that the UNWTO definition of STD mentioned at the beginning of the paragraph was stated. This directory was developed in collaboration with the United Nations Environment Programme to support governments in developing and carrying out sustainable tourism strategies (UNWTO, 2005). Other similar mechanisms and instruments for implementing sustainable tourism have been promoted over time, such as regional and national indicators, local destination management guidelines, tourism certification and benchmarking and codes of conduct (Fennell, 2006). The "Agenda 2030" and SDGs, which were adopted in 2015, transformed this theoretical framework. The UNWTO believes that tourism has the potential to directly or indirectly entangle all the goals and has identified five fundamental pillars for it to contribute and achieve sustainable development (2017), as shown in Figure 4.
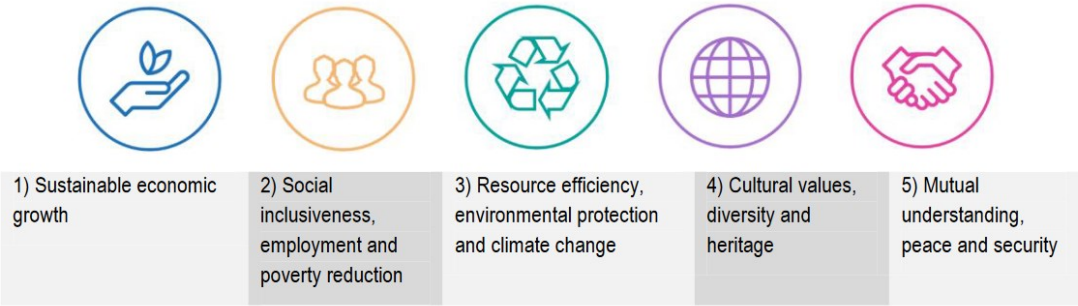
Figure 4: Tourism's Role in Five Key Areas of sustainable development (UNWTO, 2017)

The first pillar "inclusive and sustainable economic growth" is linked to SDGs 8, 9, 10 and 17. Social inclusiveness, employment and poverty reduction are connected to SDGs 1, 3, 4, 5, 8, and 10. "Resource efficiency, environmental protection and climate change" comprehend

36

SDGs 6, 7, 8, 11, 12, 13, 14, and 15. Cultural values, diversity and heritage are linked to SDGs 8, 11 and 12; and the final pillar "mutual understanding, peace and security" mainly refers to SDGs 16 (Shu-Yuan, et al., 2018).

Figure 5: The 17 Sustainable Development Goals (SDGs) (United Nations, 2015)

The identified links between tourism and the various SDGs capture the complexities of that industry. Tourism seems to be applicable to most SDGs since it is a part of the economy involving interrelated and interdependent agents operating across various sectors (Manniche, Larsen, & Broegaard, 2021). Given the nature of tourism and its ongoing growth, there seems to be a gap between policymakers' goals and the practical improvements successfully implemented in the field. Academic studies are increasingly calling for new transformative approaches to decouple tourism from the current linear economy (2021).

The SDGs are being widely embraced by both the public and business sectors as a framework for sustainable initiatives. Circular economy methods are also becoming acknowledged as critical for fulfilling many of the SDGs, and their practices can be used as a set of tools to

accomplish a significant number of SD targets (Schroeder, Anggraeni, & Weber, 2018). The circular economy requires the active engagement of all players across each sector, and it is most applicable to tourism because of its close connection to other key industries (construction, transportation, agriculture, etc.), which makes it possible to procure the materials necessary to support its value chains, including energy, land, buildings, furniture, vehicles, food, and textiles (Einarsson & Sorin, 2020). The tourism industry presents the potential for material resource reconfiguration since, while it is usually defined as a service-based economy, it also relies heavily on resource use (Manniche, Larsen, & Broegaard, 2021). Even though the scientific literature on CE application to tourism is yet expanding, research in this field is still in its early stages, and more effort is needed to better understand how to implement it (Axhami, Ndou, Milo, & Scorrano , 2023) ; (Rodríguez, Florido, & Jacob, 2020).

Thus, to gain a better understanding of how CE can be interpreted in tourism (Kaszás, Keller, & Birkner, 2022) an analysis of the existent literature on circular tourism (CT) has been conducted. The authors suggest that CT, when compared to the conventional understanding of sustainability, adds value by familiarizing each tourism actor (traveler, host, tour operator, and supplier) with the fundamental elements of system and design thinking, the circular management of the urban environment, and the methods for shaping circularity in communities. Following a similar perspective (Nocca & Girard, 2017) circular tourism may be considered for its capacity to drive circular flows and integrate sustainable resource management within the tourism industry. The researchers additionally clarify the differences between CE and green tourism. The latter seeks to minimize nonrenewable energy use and waste, whereas CT incorporates additional elements such as recovery, reuse, valorization, and regeneration. Practical applications of CT include building material recycling, modular and reusable design, and

38

the usage of upgradeable and customizable materials and products (Axhami, Ndou, Milo, & Scorrano , 2023). Moreover, circular tourism can incorporate aspects that are less physically quantifiable. An excellent demonstration of this approach is provided by the analysis of the CircE Slovenian Interreg Action Plan[21] by (Kaszás, Keller, & Birkner, 2022). The project promotes CT opportunities such as locally produced food and community gardens, distinctive tourism concepts like diffused hotels, and reuse centers for item repair.

The circular economy transition in tourism is fundamentally related to how industry actors choose to source commodities, design the product or service, and ultimately enable regeneration and manage the item's end-of-use (Einarsson & Sorin, 2020). However, the more technical circular process outlined above cannot be effective in the absence of a system-thinking approach centered on cooperation, business model innovation, and value co-creation. These three key factors enable a fundamental consideration of the aspects that support the core of a tourist destination in the long term: communities, tourism actors, and destination management organizations, to develop opportunities while limiting social and environmental negative impacts and safeguarding the destination value (2020).

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[21] "CircE – European Regions toward Circular Economy" Project of the Association of Municipalities and Towns of Slovenia (2020)

Examples of sustainable tourism

ECOTOURISM: "Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (The International Ecotourism Society, 2019). This type of tourism appeals to people who care about the environment and enjoy nature. According to the principles of ecotourism, the local community should be highly valued so that it can coordinate tourism activities and encourage local value creation (Aall, 2014) (Shu-Yuan, et al., 2018).

GREEN TOURISM: The expression can refer to any tourism activity centered on a natural resource, as well as tourism that is considered environmentally responsible. This means that a critical role of green tourism is to ensure the conservation of areas, and it is intended for tourists with a strong sense of responsibility for their surroundings. It comprises small-scale tourism facilities as well as interactions between visitors and the host community (Meler & Ham, 2012).

FAIR TRADE TOURISM: Fair trade tourism aims to maximize the benefits of tourism in destinations where inequalities and poverty are the direct consequences of power dynamics (Boluk, 2011). It relies on an equitable partnership between national and international tourism players. It also advocates for the rights of indigenous host communities and ensures that they benefit both through participation and indirectly from tourism development (Kalisch, 2001).

COMMUNITY-BASED TOURISM: It promotes the idea of "tourism by the local people for the local people". The core focus is on the local community, which has to be in charge of its tourism growth and fully profit from it. Residents are more aware of the environmental consequences of tourism and can control its expansion more sustainably. Community-based tourism is not just limited to villages and rural areas. It can encompass all aspects of tourism that can empower local communities (Rungchavalnont, 2022).

RURAL TOURISM: "A type of tourism activity in which the visitor's experience is related to a wide range of products generally linked to nature-based activities, agriculture, rural lifestyle/culture, angling and sightseeing." It typically takes place in non-urban areas where agriculture is a key industry and tourism has the potential to increase employment and combat seasonality (UNWTO, s.d.).

2.3 Circular principles applied to the Hospitality Industry

In 2017, the CIRTOINNO[22] project's authors understood the need for a study focusing on the transition towards a more circular economy within tourism (Manniche, Larsen, & Brandt , 2017). The authors explain the application of multi-level perspective, a method frequently

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[22] Cirtoinno is a project co-financed by the European Regional Development Fund through the Interreg South Baltic Programme 2014-2020. It aims to boost innovation in blue and green tourism for small and medium-sized companies by incorporating circular economy tools into their business models. In 2017, the project led to the development of a handbook for transitioning towards a circular economy within the hospitality industry of the South Baltic Region. The study is an interesting approach in this understudied field and inspires circular tourism. The findings are intended for implementation by local hospitality project partners (Manniche, Larsen, & Brandt , 2017).

used for technological transition analysis. They refer to the work of Geels (2002) to explain the three different levels a transition system, such as circular economy, occurs: landscape (macro), regime (meso) and niche (micro). The landscape level represents the various external environmental factors pushing for and influencing the transition process as per economic growth, cultural and normative values, climate change, and resource scarcity. At the level below, the term regime refers to the norms that control actions within the societal and technological structure, such as the prevailing linear 'take-make-dispose' regime of the economy. The new circular economy approach struggles to challenge the linear regime that is supported by the external environment, despite macroeconomic variables, such as increasing scarcity and resource costs, that are progressively favoring more sustainable alternatives. Thus, the real ecosystem for radical innovations consists of several small niches of interconnected enterprises within multiple sectors and domains of activity (2017). Although these niches may be limited by the societal systems where they operate, and changes at higher levels with regulations, entrepreneurial, and social initiatives are required, they can nonetheless significantly contribute to the transition to CE. Niches may begin with steps that are not entirely circular but are still simple and efficiently pointing towards the right circular direction (Manniche, Larsen, & Broegaard, 2021). Following this perspective, the dissertation narrows the focus of CE on tourism, from the hospitality industry in the last section of this chapter to the following and final part dedicated to an even narrower niche: hostels.

The hospitality industry incorporates an array of different businesses, ranging in terms of offers provided to customers, scale, and management systems (Melissen & Sauer, 2019). In English-speaking countries, learning institutions and business organizations generally use the term hospitality to refer to a cluster of service enterprises

related to the provision of food, drink, and accommodation (Lashley, 2001). In their work, Harrison & Enz (2005) expand on this definition by including enterprises that offer a combination of those three main activities. The hospitality industry frequently encompasses not only the two main sectors of accommodation and food and beverage services but also businesses involved in recreation and entertainment, such as spas and wellness centers, travel service and transport provision, for example cruise lines, and event organization, like business conference facilities (Melissen & Sauer, 2019). In this dissertation, it is more productive to consider the narrower definition of this industry which includes the subject of interest here analyzed, which is the hostel sector.

The "big five of sustainable hospitality operations", as defined by Melissen & Sauer in their analysis of Legrand et al.'s key topics of how to manage sustainably a business in this specific industry can be considered the following: energy, waste, water, food and drinks, and the building (materials and furnishing) (Melissen & Sauer, 2019) ; (Legrand, Sloan, & Chen, 2017). Fulfilling tourists' basic needs while they travel to and stay in environments other than their norm is an essential component of the HI operation. The circumstances in which these "away from home" experiences occur are primarily designed to provide shelter, food, and beverages. The construction and upkeep of hospitality facilities involve many resources, as well as energy and water. Furthermore, people's increased hedonic consumption during holidays, which expects them to consume the utilities and services they paid for as much as they please, contributes to the HI's overall negative environmental impact (Manniche, Larsen, & Brandt , 2017). These operational measurements per se cannot be considered part of the CE umbrella, although a circular economy approach to HI must address those five fundamental issues. Applied to a circular tourism (CT) business model, some of these actions could be seen as pioneering

efforts in a field in its infancy (Rodríguez-Antón & Alonso-Almeida, 2019).

Regarding waste management in the HI, it is interesting to look at Legrand et Al.'s CE strategy, as outlined here (Sustainability in the Hospitality Industry, 2023). First, within the cradle-to-cradle concept (v.; p.9), waste is converted into a resource; therefore, it is more appropriate to speak of resource management. The authors look beyond the traditional 3Rs (Reduce, Reuse, and Recycle) approach of the circular economy. They suggest a circular model that focuses on three main dimensions: resource, usage, and return. This classification configures the actions that can be undertaken in the HI to manage resources, and it is visually represented in the study as in Figure 6.
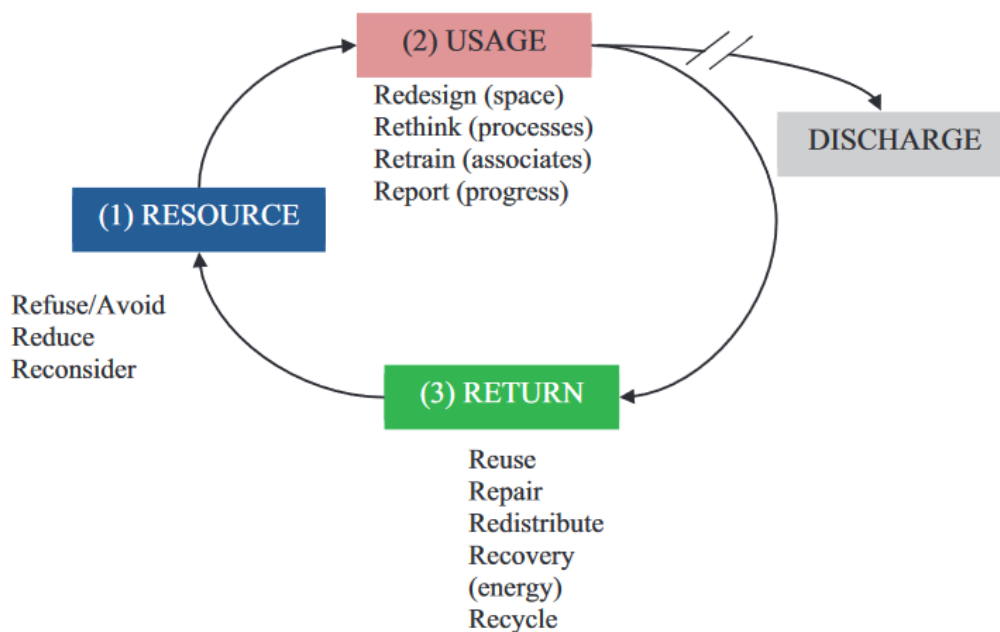
Figure 6: Management resources in a circular thinking in hospitality (Legrand, Chen, & Laeis, 2023)

Thus, there should be a collaborative effort with suppliers to source the necessary resources in the appropriate quantities and to carefully select the supply chain. One example of this approach involves

choosing providers that offer remanufactured furniture and restoration strategies and purchasing items with a longer lifespan. Such waste-reduction measures result in less pollution and fewer management tasks and can additionally allow financial savings. The usage dimension enables businesses to focus on how HI standard procedures can be optimized to achieve maximum resource efficiency. For example, a hotel breakfast buffet implies less control over food waste management. Keeping the working space efficient and reporting progress to team members and stakeholders are also other implications of a monitored usage dimension. Finally, the circle can close at the Return dimension if the other two dimensions successfully lead to the management of resources. The final step comprehends circular measures to treat waste as a resource, such as reuse, repair, redistribute, and lastly, recycle. Legrand et al. provided insight into how resource management could be more effectively handled in the HI. However, as (Florido, Jacob, & Payeras, 2019) point out, most HI businesses remain firmly oriented around the conventional 3Rs approach. In recent years, rethinking and redesigning have also been increasingly applied to provide clients with innovative products and services while lowering hospitality operating costs (2019). These methods can be employed in interior design to reduce energy and water consumption (Kaszás, Keller, & Birkner, 2022). Equipment that uses nonrenewable energy can be substituted, and completely circular energy can be obtained and monitored using environmental management systems, which may additionally provide information on water usage. The latter can be addressed by using sustainable laundry services and greywater systems to reuse water for gardening and toilet flushing (Manniche, Larsen, & Broegaard, 2021) ; (Legrand, Chen, & Laeis, 2023).

Water and energy management choices are then connected to the building in which the HI business is taking place, and circularity is

applied to the overall structure. According to Cheshire[23] it is necessary to design 'in multiple layers' to apply CE principles to construction (Bompan & Brambilla, 2021). This process calls for a careful selection of materials, creating structures that can be disassembled, in part or entirely, to reuse various components and recover materials (2021). An increasing number of hotels are implementing smart construction technologies, such as the Internet of Things[24] solutions, to collect data and ensure building optimization (Rodríguez, Florido, & Jacob, 2020). Finally, Manniche et Al. recommend that HI develop leasing operations for furniture, equipment, and the interior design of the business location (2017). These authors also analyzed the fifth and last of sustainable hospitality's main operations: food and drinks. Waste management of these resources is fundamental both for restaurants and accommodation structures that provide dining services. Circular initiatives to tackle food and beverage negative impacts could include improving and planning menus to limit waste, avoiding buffets, employing sharing platforms for food distribution networks, like *Too Good To Go*[25], and developing circular synergies between tourism and agriculture to promote local food (Rodríguez, Florido, & Jacob, 2020) ; (Florido, Jacob, & Payeras, 2019).

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[23] David Cheshire is the Regional Director of AECOM, a multinational infrastructure consulting company.

[24] The Internet of Things (IoT) refers to material objects with sensors that connect them to computing systems through wired or wireless networks, resulting in an innovative monitoring system. It is a technology created to connect the digital and physical worlds, powered by internet connectivity and data, and is regarded as one of the most significant digitalization trends (McKinsey & Company, 2022).

[25] Too Good To Go, founded in 2015 in Copenhagen, connects consumers with businesses whose food and beverage products would otherwise go unsold and disposed of. The company began with the goal of saving wasted buffet food, and the concept was expanded to include other providers, mainly restaurants and cafés. It enables businesses to profit from products that should otherwise be thrown away, while also providing consumers with affordable food options. In 2020, the Too Good To Go mobile app was available in 14 countries and had already saved 29 million meals (Zero Waste Europe, 2020).

The aforementioned examples illustrate potential implementation of circular tourism in the hospitality industry, and similar cases will be deeply discussed in the next chapter, focusing on CE in the hostel sector. Reflecting on the previously mentioned study of Geels (2002) on multi-level perspectives, niches are important spaces for the formation of networks that promote technological and social developments and impulse systemic change. The hospitality industry can be an example of a niche for accelerating the radical innovation of circular tourism. This process can be carried out gradually by using sustainable measurement techniques such as those described in this paragraph. However, for circular tourism to become a reality, the creation of business relationships is critical in changing the value chain and ensuring that resources flow circularly (Florido, Jacob, & Payeras, 2019). This extends attention to the often-overlooked social and human aspects of CE, that are particularly pertinent to the tourism industry, which should focus on communities, people, and their interactions. The significance of social capital within a CE is expressed through the primary intangible resources created by human connections that do not involve monetary transactions (Einarsson & Sorin, 2020). For such a network of immaterial social resources to be efficient and allow innovation in the HI, a local CT organization could boost communication and creativity with the support of digitalization and social platforms to build a shared circular strategy aimed at value co-creation. (Florido, Jacob, & Payeras, 2019). The same factor that makes the tourism industry so challenging to manage sustainably can become an asset within a circular economy: its close relationship with other industries and supply chains may be used to create a positive multiplier effect that distributes equitable job opportunities and money flows for social development (Einarsson & Sorin, 2020). The only resource with the ability to be creative is found within humans, hence the importance of employment (Stahel W. , 2011). The necessity for social capital to be recognized properly is described in Stahel's ideas

for reforming the tax system (2011). The author believes that taxation should promote sustainable solutions, such as people; thus, he proposes to apply it to non-renewable resources instead of to workers. A similar shift would encourage the development of more circular business models and raise wages, particularly for low-skilled employees (Einarsson & Sorin, 2020). Making tourism more circular should start with improving working conditions to ensure fair compensation as well as possibilities for growth and development. This would not only translate into social innovation but also help the industry, which is strongly reliant on the human element, in its long-term sustainability.

The collaborative effort of various actors in HI can boost the overall quality of services of the tourist destination and diversify tourism activity towards more sustainable options. This entails a rethinking process involving asset recirculation, the implementation of circular collaborative models (such as leasing and product as a service), and the establishment of common access to cutting-edge technology and green certification to save expenses and improve intra-organization operations (2019) ; (Kaszás, Keller, & Birkner, 2022). The development of circular tourism will also create new job opportunities and necessitate employee training to foster shared circular knowledge and implementation (Legrand, Chen, & Laeis, 2023). Finally, another key actor that may participate in this circular transformative network is the tourist. Immersed in a new environment different from the one they are used to, tourists can experience a rethought, more sustainably conscious way of living during their stay in a circular location. This is noteworthy from a societal standpoint because it represents a way to spread the CE transition. Moreover, it widens CT market opportunities for both businesses and tourism destination management (Manniche, Larsen, & Brandt , 2017).

Chapter 3: The Circular Economy applied to the Hostel Sector

After exploring the state of the art of circular economy, its application to tourism in general and to the hospitality industry in particular, the following paragraph goes deeper into the analysis of this paradigm in the hosteling category.

First, the evolution of the hostel industry will be addressed, followed by the identification of its target customers. Then, six hostels will be examined using the ReSOLVE Framework, an approach to gain a better understanding of circular and sustainable practices in the field.

3.1 The Hostel Sector

Hostels are a type of accommodation within the hospitality industry that provide affordable stays (Veríssimo & Costa, 2019). They are characterized by communal facilities and a social atmosphere and differ from other lodging providers primarily in pricing and space management. In fact, hostels are often structured in dormitories, where guests book individual beds in a room with additional beds for other customers rather than booking a private room as in other hospitality arrangements, such as hotels (Tavares, Condurú, & Santos, 2021). The multiple-bed factor is the primary component of the hostel financial model, generating revenue per square meter (Hostelworld, 2022). Whereas the key metric for the hotel revenue management strategy is RevPAR[26], revenue per available room, the hostel one is

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[26] RevPAR: It represents the revenue generated per available room, whether or not occupied. The RevPAR formula is obtained by multiplying the average daily rate (ADR) by the occupancy rate, as shown hereunder. It is a fundamental metric in the hotel industry to measure performance and generate the right price per room.
Average Daily Rate = Total dormitory beds revenues/Total dormitory beds revenues
Occupancy Rate = Number of occupied rooms/Total Rooms Available

RevPAB[27], revenue per available bed. A research published in 2016 by the tourism data provider Phocuswright Inc, explains how 70% of hostels worldwide feature four- to six-bed dorms, with only slightly more than half providing eight-bed dormitories (2016). Yerle, brand manager of Hostelling International[28] which is one of the leading youth hostel networks, outlined how even before COVID-19 a trend for more privacy and smaller rooms was growing among the hostel industry (Frommer's, 2023) to satisfy the needs of a wider target interested in the social aspect of the hosteling category while still taking care of its privacy. To meet this growing demand, 9 in 10 hostels have private room options (Hostelworld, 2016). Among the key features sought by customers in this type of accommodation, early researches on the field outlined the good value for money and location (Firth & Hing, 1999) confirmed by more recent studies (Hostelworld, 2016) emphasizing also the importance of the opportunities given to meet other travelers in shared areas and of providing the feeling of home away from home (Bahls, 2015). Nowadays, other characteristics are considered more and more relevant: cleanliness and facilities, location and city

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$RevPAR = Average\ Daily\ Rate\ x\ Occupancy\ Rate$

$RevPAR = Total\ Revenue\ from\ occupied\ rooms\ /Total\ Rooms\ Available$

(Amadeus Hospitality, 2023)

[27] RevPAB: It represents the revenue per available bed. The formula is the respective RevPAR for hostels and therefore considers bed units instead of rooms.

$RevPAB = Total\ dormitory\ beds\ revenues\ /Available\ dormitory\ beds$

$RevPAB = Average\ Daily\ Rate\ (per\ bed) \times Occupancy\ Rate$

(Price Point, 2021)

[28] Hostelling International, as the name suggests, is an international membership organization dedicated to ensuring an inclusive, safe, and affordable hosteling environment. The association was founded by Richard Schirrmann, a German schoolteacher who is considered the pioneer of this type of accommodation. During a trip, he and his schoolchildren had to sleep in a barn as there were no affordable places to stay. This experience made him realize the need to provide young people with limited resources with a safe and affordable option to travel. The teacher then proposed for the schools to be transformed into temporary dormitories during the educational holidays, and in 1912, he founded the first youth hostel in a restored castle in Altena, Germany. In 1932, he created the German Youth Hostel Association, which expanded globally to become, in 2006, what is known today as Hostelling International (Hostelling International, 2021).

connection, as well as staff and the social atmosphere they help to create (Brochado, Paulo, & Gameiro, 2015).

3.1.1   Hostels: Market and Trends

The worldwide hostel market was expected to increase at a compound annual growth rate (CAGR) [29] of 5.2% from 6.04 billion dollars in 2022 to $6.35 billion in 2023, and it is estimated to expand at a CAGR of 4.8% to $7.65 billion in 2027 (The Business Research Company, 2023). This promising trend is attracting investors, as seen with TPG Real Estate's 2017 acquisition of A&O Hotels and Hostels [30], Europe's largest privately owned hostel network (Texas Pacific Group, 2017). The new data prospects are particularly interesting given the disruption of the COVID-19 outbreak in the tourism industry. Despite the challenges of finding accessible and specific market research and analysis, Hostelworld Group[31], a leading online travel agent (OTA), may provide useful insights[32]. Hostelworld (HW) had a net revenue of €15.4 million in 2020, a decline of 81% compared to the previous year (€80.7 million) (Hostelworld Group, 2021). However, the company's first

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[29] The compounded annual growth rate (CAGR) is a method to analyze the rate of return (RoR) of an investment. It is a hypothetical number that allows the different annual growth rates to be "flattened" into a single summary value. The CAGR formula is: $CAGR\ (\%) = \left(\frac{Ending\ Value}{Beginning\ Value}\right)^{\frac{1}{Number\ of\ Periods}} - 1$; (Dallocchio & Salvi, 2011)

[30] a&o Hotel and Hostels was formed in 2000 with just a handful of hotels in Berlin and is today the largest privately owned hostel chain in Europe, with 40 locations in 25 cities. Their strategy focuses on offering both hotel and hostel options, allowing their guests to choose between a private room and one bed in a dorm, without compromising the price or the international atmosphere (a&o Hostels, s.d.).

[31] Hostelworld Group Plc is an international OTA specializing in the hostel industry. Founded in 1999, Hostelworld today has hostel partners in 170 countries and has expanded into a social network for their customers to meet fellow travelers using a platform that links people who are visiting the same location (Hostelworld Group, s.d.). It might be defined as the main Booking OTA competitor in the hosteling market.

[32] An online travel agency (OTA) is a web-based marketplace where consumers can purchase travel products and services such as accommodation, flights, and other means of transportation and travel experiences. OTAs act as an intermediary between potential customers and tourism suppliers, providing business tools for targeting travelers, processing bookings, protecting both parties with cancellation policies, connecting with guests, and handling reviews (Expedia Group, s.d.).

interim result for 2022 appropriately reflects the significant recovery recorded in the opening months of that year, proving the hosteling sector's ability to "capture pent-up demand as the travel market returns", as stated by CEO Gary Morrison (Hostelworld Group, 2022, p. 2). He follows by explaining that "June 2022 net bookings reached 80% of June 2019 levels (up from 33% in January), and net revenue reached 104% of 2019 levels (up from 34% in January), driven by higher average booking values". Arguably, hostels experienced the hardest struggle within the hospitality sector, even when travel restrictions started to ease in 2021; travelers initially kept preferring private accommodations rather than shared ones, which represent the main offer of hostels (Vox Markets, 2023). Now that the post-pandemic recovery has taken place, the geopolitical tensions, analyzed in the first chapter, have led to global uncertainty and economic consequences, including a rise in commodity prices, supply chain disruptions and, as a result, inflation in goods and services on most markets (Report Linker, 2023). The current economic environment, which is characterized by rising prices and diminishing buying power, may play a role in the rebound of budget and sharing accommodations like hostels (CBRE, 2022). With the economy recession the world is facing, consumers' attention to prices is obviously increasing. Nevertheless, hostels maintain their appeal for being among the most convenient offers on the market, enabling companies to propose higher prices than ever before. As an example of its transition and the opportunities it entails, the international hostel brand Safestay (based in the UK) announced a 20% surge in average bed rate from £19.70 in 2021 to £23.63 in 2022 (Safestay, 2022). To reflect this increase in market pricing, the hostel business is undergoing an evolution to deliver a higher value proposition. They now provide private rooms in addition to the traditional shared options in dorms, they show a particular care for interior design and décor together with the

experientialism to suit a wider and not only young audience, especially when located in touristic destinations (Hostelworld, 2016).

3.1.2 The evolution of the hostel industry along with its target customers

The data being analyzed in the previous section shows that the hostel industry has been experiencing significant growth and development in recent years. From the initial focus on providing an affordable service, there had been an increasing trend towards offering guests the right balance between privacy and sociability and the value for money they sought from their hostel experience (Rashid-Radhaa, Lockwood, & Nolan-Davis, 2016). The resulting evolution led to a broader range of hostel rooms, including but not limited to double, four-bed, and six-bed rooms that can also be booked in their entirety by couples, families, and groups and are equipped with single beds, double beds, and/or bunk beds. In addition, female-only dorms have become a popular solution to offer an increased sense of safety for these customers. This is relevant if it is considered that reservations by solo female travelers rose by an impressive 88% in the preceding four years of 2019 (Hostelworld, 2019). Furthermore, there is a growing attention to the design of common areas and the services and ambiance they can offer. This includes shared kitchens, various leisure spaces, co-working areas, and laundry facilities (Christie & Co, 2020). The differentiation of hostel spaces additionally presents further opportunities for activities and events, interaction among guests, and local life experiences. For instance, the Yellow Square Hostel in Rome has a hairdresser open both to guests and locals (Contest Rock Hair, 2018), the Saas-Fee Wellness Hostel 4000 is a Swiss luxury hostel that encompasses a wellness area, a covered swimming pool, and a gym (Saas-Fee wellness Hostel 4000, 2017) and among the best hostels for solo travelers there's a themed one called The House of Sandeman on

top of Porto wine cellars and where dorm beds are created from old barrels (Hostelworld, 2019). Nowadays, there are many examples of how the hosteling sector may evolve from simple budget accommodation to unique travelling experience, but as evidenced by an analysis of the market in Spain and Portugal (Christie & Co, 2020), three main categories of hostels are successfully spreading, especially in Europe lately.

The most common kind is the *Budget Hostel* defined by modest amenities, simple decorations and limited food and beverage services. *Youth and Backpacker Hostels* fall under this category and represent 72% of the total in the Iberian Peninsula. (Timothy & Teye, 2009) associate this old concept of hosteling with young and independent international tourists looking for low-cost options throughout their journeys, as well as opportunities for engaging with people in their socioeconomic and age groups. The second category is the *Design Hostels*, prioritizing details, cleanliness, and decorative elements (Christie & Co, 2020). In comparison, the latter offers an increased number of supplementary services to enhance the guest experience. This umbrella term also encompasses *Boutique Hostels*, which can be described as the most exclusive yet accessible kind. The third category includes the *Themed Hostels* which continue to represent a small percentage of the industry due to their focus on niche markets. These accommodation providers center around a specific focus, as shown by their activities and events, business operations, interior design, and more. *Themed Hostels* include those that prioritize entertainment and sociability, such as *Party Hostels*, and sports activities, notably *Surf Hostels*, as well as those that contribute to positive environmental and social impact, such as *Eco Hostels*.

The progressive development of this industry was, of course, driven by the evolving interests of its target clients. The 2016 Hostelworld report

"Millennials travelers are fueling the hostel revolution" showed that the hosteling category could have further improved its offer in the following years, especially thanks to the youngest globetrotter generation at the time: Millennials[33]. When the report was published, they were aged between 18 and 35, and they preferred longer trips for social interaction and shared adventures (Hostelworld, 2016). Then it became clear that Generation Z[34] would follow and boost the tourism trend started by Millennials. Gen Z put aside time and money to travel, preferring affordable accommodation (Sheivachman, 2017) and scheduling trips around work or university holidays rather than gap years, as Millennials did (Hostelworld, 2019). Morrison, the previously mentioned CEO of Hostelworld, presented the evolution of hostel customers as primarily members of the aforementioned generations, with 80% being between the ages of 18 and 35 (Hostelworld, 2023). Most of these travelers have not started a family yet, nor have a permanent contract, thus having a more flexible lifestyle and being ready for new opportunities and adventures. Hosteling serves as a form of identification for these clients; it represents their values, the people they encounter along their journey, and the experiences they share. Furthermore Morrison highlighted the significant rise of solo travelers, for whom the previously mentioned aspects of traveling are even more important and searched for (2023). This new tourism trend is about taking the time to thoroughly discover a destination and immerse in the local culture, rather than trying to stop off at every must-see site in a short time. Gen Z travelers want to visit fewer cities in a single trip, with more than one in every eight choosing to visit just one or two (Hostelworld, 2019). This is related to a drop in the number of countries they intend to explore in one set: a maximum of two for Gen

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[33] There is no exact age difference between generations; however, it is generally believed that Millennials were born between the early 1980s and the late 1990s (Hostelworld, 2023).

[34] Generation Z, also known as Gen Z, encompasses people born between the late 1990s and early 2010 (Hostelworld, 2023).

Z, compared to the 5 or 6 planned by Millennials (2019). The increased awareness of the impact of their travel reflected in younger tourists' preferences led to the development of another hosteler trait that is particularly relevant to the aim of this research: they are becoming more environmentally conscious. According to a recent HW market research, 53% of their customers consider sustainability an important factor (Bureau Veritas, 2022)*. Younger generations are more likely to be looking for sustainable travel options on occasion, and Gen Z will only gain influence in this manner as their spending power grows over time (Mandich, 2021)*. Therefore, businesses in the hospitality industry, particularly hostels directly and naturally linked to youth, ought to consider their target audience's environmental awareness as an additional reason to incorporate SD and CE principles into their daily operations. Furthermore, 82% of HW customers believe hostels are more sustainable than other types of accommodation (Bureau Veritas, 2022)*. According to a study carried out by Bureau Veritas[35], commissioned by HW, hostels are 75% less carbon-intensive than hotels. The finding was identified by calculating the carbon dioxide equivalent of direct and indirect emissions (tCO_2e[36]) from the two HI sectors. Carbon intensity was measured per occupied bed rather than per room to provide the most effective comparison possible (2022). The research conclusion is reinforced by a HW survey conducted on 400 hostel partners in March 2022. 56% of respondents stated they were already engaged in sustainability initiatives, with another 37% indicating they were interested in participating in related projects (Hostelworld, 2023)*.

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[35] Bureau Veritas is a company providing laboratory testing, inspection, and certification services for other businesses. The group has 82,000 employees, operates in 140 countries, and works for a portfolio of clients to ensure that they fulfill quality, health and safety, environmental and social responsibility criteria (Bureau Veritas, s.d.).

[36] tCO_2e: tonnes of carbon dioxide equivalent emissions

In the following section, examples of CE and SD approaches that hostels are employing will be assessed, demonstrating the opportunities that this HI sector may have to reduce negative and increase positive environmental and social impacts.

3.2 The ReSOLVE Framework applied to the hostel sector

The ReSOLVE Framework, presented by the Ellen MacArthur Foundation, outlines six key dimensions of actions that businesses, organizations, and governments may adopt to evaluate circularity opportunities within their systems, facilitate the transition to a circular economy, or initiate a circular business model (Ellen MacArthur Foundation, 2015)[37]. The EMF initially identified CE applications in diverse scenarios through case studies and expert interviews. Based on these findings, the Foundation determined the six dimensions that encompass most actions that can be carried out under CE principles: Regenerate, Share, Optimize, Loop, Virtualize, and Exchange, made into the acronym ReSOLVE from the initial letters of each dimension plus the extra lowercase "e" of Regenerate to make it meaningful. Each dimension comprises a set of CE action subcategories that can be applied to and diversified for different applications. In the first report in which EMF presented the framework, it was exemplified in three different sectors: mobility, food, and the built environment. For

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[37] If not mentioned otherwise, the ReSOLVE method analysis will be deducted from the official study where it first appeared, which is titled *"Growth within: A circular economy vision for a competitive Europe".* The report was sponsored by SUN (*Stiftungsfonds für Umweltökonomie und Nachhaltigkeit*/ Foundation for Environmental Economics and Sustainability), a non-profit organization focused on environmental research, international policies, and cooperation. The article was co-authored by the EMF and the McKinsey Center for Business and Environment. The latter engages with companies, authorities, and non-profit organizations to address multi-level sustainable development (Ellen MacArthur Foundation, 2015).

instance, Arup corporation[38] employed this method to analyze CE in the construction industry and to present the concept of building in 'layers' so that any structural element can be easily separated and removed, actions like reuse, remanufacture, and recycling can take place, and the overall circularity is improved (Arup, 2016). Arup case studies demonstrate how some organizations successfully implement CE across all six dimensions, while others may specialize in just a few and still functionally make use of CE principles.

The graphic below is from the report (Towards a Circular Economy: Business Rationale for an Accelerated Transition, 2015) and shows the ReSOLVE framework as described by EMF.

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[38] Arup is a corporation that provides a variety of construction-related professional services, such as engineering, design, and consulting. It encompasses the work of 18,000 designers and specialists from 140 countries. Its goal is to ensure the building sector's sustainable development. (Arup, 2016) ; (Arup, s.d.)

Figure 7: The ReSOLVE Framework (Ellen MacArthur Foundation, 2015)
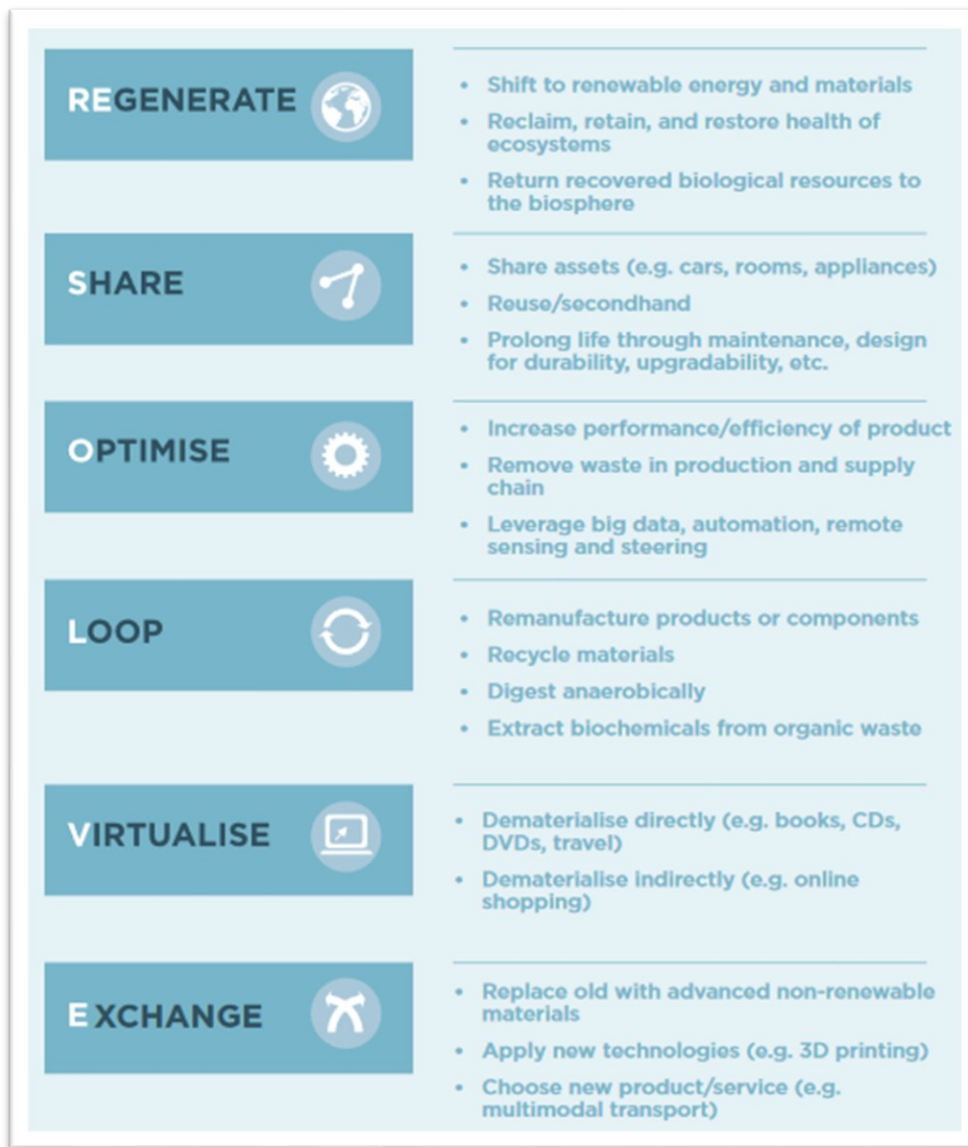
3.2.1   Methodology

The present study adopts the EMF ReSOLVE framework, shown in Figure 7, as an organizing principle to examine CE implementation within the hostel industry. To accomplish this, while all six dimensions were retained from the original framework, the interpretation of some of them was modified, and the subcategories' structure was partially

adapted to ensure that the analysis encompassed all actions deemed particularly relevant to the sector here studied.

Six hostel companies were selected to demonstrate how the ReSOLVE method can be implemented. The qualitative analysis aimed to capture the most from the business studies. Therefore, the six hostels were chosen first and foremost because they all take measures to address each dimension, albeit sometimes small and improvable. As a result, it was possible to categorize all CE actions undertaken, understand if there is a pattern that could potentially lead to a CE framework for this industry, highlight innovative ways to apply CE principles, and finally consider what could potentially be improved. To procure these findings, which will be discussed in the final chapter, it was deemed more interesting to analyze hostels located in various locations, with differences in their organizational dimensions (hence the inclusion of a hostel chain), but all combined by their commitment to sustainable tourism development and/ or circular economy. The expressed identification with CE principles was not considered an essential aspect for a hostel to be analyzed. In fact, CE may not be explicitly stated in business marketing communication, but that does not necessarily imply a lack of implementation in daily operations.

The business studies were selected through online research with keywords relevant to circular economy and sustainable tourism development. The "Eco Warrior" section of Hostelworld Hoscars[39], a prize awarded every year to the best hostels for environmental initiatives, represented another helpful tool during the selection process. None of the hostel organizations were interviewed, and all information has been gathered from what is available online. As a

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[39] Hostelworld's Hoscars Awards are presented at the end of each year to recognize the best hostels worldwide. Users can vote for their favorite nominees, and winners are then nominated and grouped into hostels' categories, such as The Community Champion, The Eco-Warrior, and The Digital Nomad (Hostelworld, 2023).

result, the study is based solely on how companies promote themselves on the Internet, and some information may be outdated, missing, or even susceptible to greenwashing[40]. Given the limited academic research in the hostel industry, the most appropriate and effective CE actions were selected for examination using the revised ReSOLVE framework. This selection was based on the author's experience in the field, the considerations discussed in the previous chapter on circular tourism applied to HI, and an understanding of the measures preferred by hostels aiming to integrate SD and CE into their operations. Some actions strengthen the outcome of other actions, resulting in a powerful compounding effect (Ellen MacArthur Foundation, 2015). This reflects the complexity and efficacy of a circular business model and leads to some measures that could be categorized under more than one dimension. In this context, a placement choice was made with the objective of better representing the analyzed field.

The revised ReSOLVE Framework employed in this study is represented by the scheme below (Figure 8). The first level comprises the dimensions, the second level contains their subcategories, and on the third level some subcategories are furtherly classified in a set of CE actions.

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[40] Greenwashing refers to the inappropriate use of environmentally friendly values (e.g., without actually taking any effective actions to support those principles), by companies, governments, influential individuals such as politicians, or other forms of organizations to promote their image and/or sell products, services, or ideas (Legrand, Chen, & Laeis, 2023).

ReSOLVE Revised Framework

REGENERATE

Shift to renewable energy and materials
- Renewable Energy
- Other renewable/optimized sources

Reclaim, retain, and restore health of ecosystems
- CO2 compensation
- Carbon Neutrality
- Gardening or green optimization

Return recovered biological resources to the biosphere
- Composting

SHARE

Share assets
- Community-based lifestyle
- Coworking space
- Repair/Exchange Center
- (Responsible) group tourism experiences
- Leasing

Reuse/Secondhand
Prolong life through maintenance, design for durability, upgradability
- Upgradability/Upcycling

OPTIMIZE

Increase performance/efficiency
- LED lights
- Dining menu optimization

Remove/limit waste
- Water control
- Free drinkable water
- No Plastic Initiatives
- Items compositions
- Cleaning products

Chose supply chain
Choose food chain

LOOP

Remanufactured/Refurbished products or components
Recycle materials
Food waste loop
Modular Construction and Design
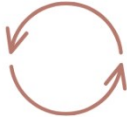
VIRTUALIZE

Smart Monitoring Systems
Innovative Network and Internet usage
Sharing Platforms

EXCHANGE

Environmentally conscious practices with guests
Social projects for and with (local) community
Network and Partnerships
- Local Business partnership
- Organization partnership

Work Organization
- Staff training and incentives
- Volunteer opportunities

Figure 8: The revised ReSOLVE framework

In the following section of the study, the six case studies will be presented, then each dimension of the revised ReSOLVE framework will be analyzed, and variations to the original framework will be outlined and justified. Finally, these case studies will effectively show the adoption of the various CE actions in each dimension.

3.2.2   References

To smoothly enhance the analysis section and prevent redundancies, all main references used to gather information for each of the case study hostels are listed below, including webpages or online documents accessed during the analysis from January 1st to February 29th 2024.

- Impact Beach House Hostel
  - Impact Beach House Webpage
  - Imapctrip Website
  - Impact Report 2022
  - Hostelworld profile

- Madama Hostel & Bistrot
  - Madama Hostel & Bistrot Website
  - Madama Goes Green Manifesto
  - Hostelworld EcoWarriors Finalists
  - Hostelworld Profile

- Cohort Hostel
  - Cohort Website
  - Cohort Sustainability Webpage
  - Hostelworld Profile

- Cocomama Hostel
  - Cocomama Website
  - Mama Cares Webpage
  - Ecomama Website
  - Clink Hostels acquisition of Mama Brand
  - Clink Hostels Website
  - Hostelworld Profile

- The Yard Hostel
  - The Yard Website
  - Hostelworld Blog page on eco-friendly hostels
  - Hostelworld Profile
  - The Yard on Sustainable Guides

- Stayokay Hostels
  - Stayokay Website
  - Stayokay Sustainability Webpage

3.2.3   Case Studies

ANALYZED HOSTELS AT A GLANCE

Name

IMPACT BEACH HOUSE

Business Organization

One of the two hostels owned by the main social enterprise Impactrip

Room No. and Types

10 rooms: 3 private options and 7 dorms

Location

Estoril, Cascais, Portugal

Located by the beach of Estoril, the hostel is dedicated to climate action with a special focus on ocean conservation and circular economy. The company partners with a local dive school to protect and clean the bay with guest help. Circularity and sustainable development are also at the heart of the main social enterprise that owns the hostel, called Impactrip, a tour operator that offers volunteer travel experiences with positive social and environmental impact. Impactrip also runs Impact House, a hostel in Lisbon dedicated to sustainability.

Name

MADAMA HOSTEL & BISTROT

Business Organization

Madama Srl. Hostel and Restaurant

Room No. and Types

11 rooms, including dorms and private options, for a total of 60 beds

Location

Milano, Italy
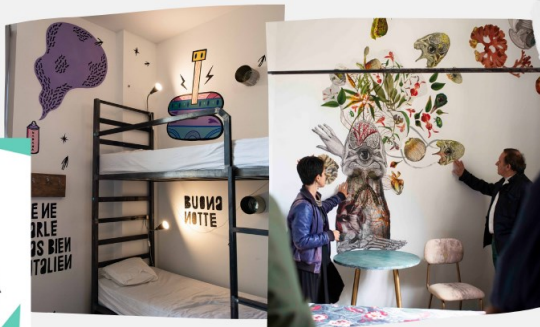
Madama Hostel & Bistrot is a design hostel that is located in a Art Nouveau style building in Milan. Their slogan, "Sounds like home", is dedicated to both travelers and the local community, which gather in communal areas such as the Bistrot. The "Madama Goes Green" initiative demonstrates the company's commitment to sustainable development. Madama Hostel & Bistrot is also a museum, with artwork and mural decorations everywhere.

ANALYZED HOSTELS AT A GLANCE

Name

COHORT HOSTEL

Business Organization

Hostel accommodation provider

Room No. and Types

60 beds, dorms, private and family rooms

Location

The Stennack, St. Ives, UK

Cohort is based in St. Ives, Cornwall. The hostel's name refers to a group of people sharing an experience and expresses its aim to provide guests with an authentic and inclusive stay. It is a low-impact lodging that focuses on accommodating educational institutions, families, and travelers. Cohort's "Project: Planet Rebuild" initiative indicates its commitment to minimizing the negative environmental impact of its operations.

Name

COCOMAMA

Business Organization

One of two lodgings under the same brand, both acquired by Clink Hostels, a network of privately owned hostels, in 2020

Room No. and Types

Range from private double rooms to 6-bed dorms

Location

Amsterdam, The Netherlands

Cocomama is a boutique hostel located in the heart of Amsterdam. As the name implies, it is all about familiarity and coziness, intending to blend the comforts of a hotel with the atmosphere of a hostel while still maintaining reasonable prices. It provides Holland-themed rooms, such as one inspired by Van Gogh's artworks. The "Mama Cares" slogan advocates its environmental awareness. Following Cocomama's success, the brand launched another boutique accommodation in the same city: Ecomama. Although both structures offer private and dorm rooms, the latter is more hotel-like.

ANALYZED HOSTELS AT A GLANCE

Name

THE YARD HOSTEL

Business Organization

Hostel accommodation provider

Room No. and Types

Private lofts and rooms, dorms from 4 up to 8 beds

Location

Bangkok, Thailand

The Yard was founded by two friends who had never stayed in a hostel before. However, they were passionate about welcoming people and wanted to build a "Bangkok's oasis" where visitors could feel at home. Their primary focus is on people and the environment, to reduce negative business impact while supporting positive change. The hostel is surrounded by a green yard where shipping containers were transformed into bedrooms and a community area in collaboration with other businesses that provide services to residents and guests.

Name

STAYOKAY

Business Organization

Hostel chain with 20 locations throughout the Netherlands

Room No. and Types

From dorms to private rooms, lofts and experiential accommodations

Location

The Netherlands

Stayokay is a chain of 20 hostels located in The Netherlands. The organization provides a coherent brand for all its accommodations, with a social and sustainable offer targeted at groups, schools, and families, along with options for couples and solo travelers. Their lodgings range from themed hostels to private lofts in nature. Sustainability at Stayokay is achieved through four goals: Mission Zero, Close the Loop, We Love H2O, and Feel Good.

3.3 Regenerate

The Regenerate dimension refers to all actions undertaken to safeguard and retain natural capital (Iyer-Raniga, 2019). The subcategories employed here are the same assessed by the EMF Framework.

REGENERATE
Shift to renewable energy and materials
- Renewable Energy
- Other renewable/optimized sources

Reclaim, retain, and restore health of ecosystems
- CO_2 compensation
- Carbon Neutrality
- Gardening or green optimization

Return recovered biological resources to the biosphere
- Composting
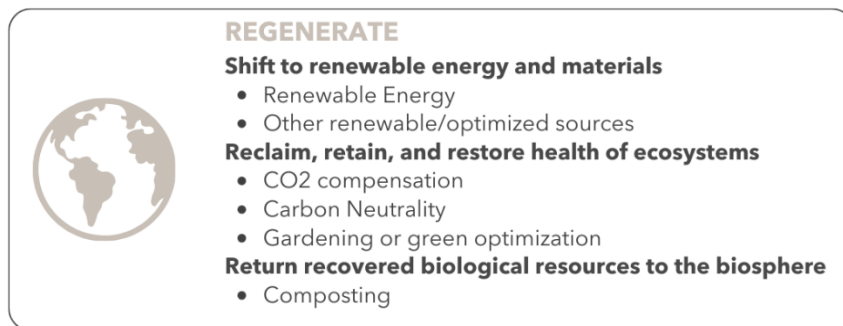
Figure 9: Regenerate Dimension

3.3.1 Shift to renewable energy and materials

Under the implementation of "renewable energies and materials," a further distinction was made between renewable energy solutions and other forms of green or optimized sources to comprise simpler yet effective actions that can be taken to reduce resource consumption in a hostel. While there may be structural limitations to implementing renewable solutions in a building, there are alternative technologies that can still make the hostel more sustainably and efficiently powered. Among the six assessed hostels, *Cohort* and *Impact Beach House* rely on energy from renewable sources while minimizing consumption. *Stayokay* which is a chain of hostels, has only installed solar panels in some of its lodgings. However, it guarantees that all its buildings are supplied by green energy, particularly wind power from Europe. Moreover, *Stayokay* and *Cohort* employ other renewable or optimized sources. The first reduces dispersion through energy-efficient equipment and building insulation, employs ecogas, and provides charging stations for guests using electric vehicles. The latter takes

68

measures to improve the efficiency of its water, gas, and electricity usage, and it has replaced its heating boilers with A-rated ones. To reduce the negative environmental impact, The Yard provides visitors with air conditioning powered by energy-efficient inverters. The hostel also implemented a unique recycling technique for naturally cooling rooms using wall insulation made from recycled paper. Finally, *Madama*
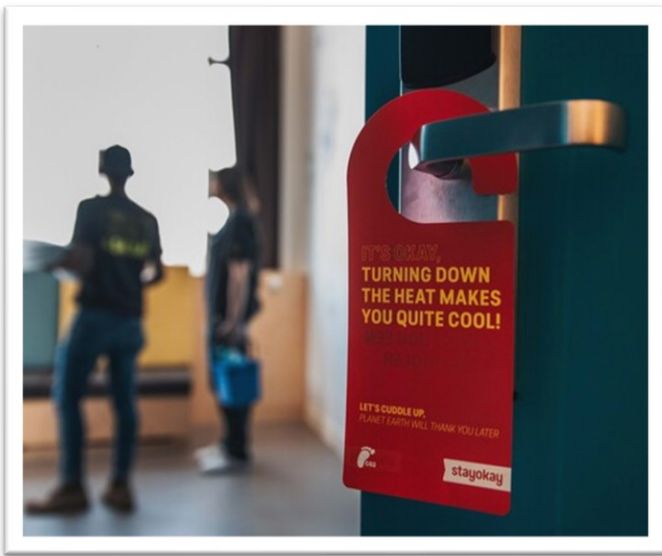
Figure 10: Environmental awareness quote on Stayokay door hangers (Stayokay, s.d.)

uses an electrically powered heat pump system, and *Cocomama* has double-glazed windows to keep the building warm and reduce noise from the outside.

3.3.2   *Reclaim, retain, and restore health of ecosystems*

This subcategory includes three sets of measures, two of which are related to CO2 emissions: carbon neutrality and CO2 compensation. Carbon neutrality (CN), as envisioned by (Legrand, Chen, & Laeis, 2023), is one of the micro-certifications schemes that HI businesses should attain within a certain time to meet SDG 13[41]. If the goal of CN is not yet attainable, daily operations can be improved to minimize the overall company's impact on the environment, and a carbon offset scheme may be implemented to compensate for the business's CO2 emissions. *Cohort* achieved the recognition of being a CN company

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[41] SDG13: Take urgent action to combat climate change and its impacts (United Nations, 2015)

from Carbon Footprint[42] by quantifying overall CO2 emissions and offsetting them with certified carbon credits. The hostel compensates for its environmental impact through a UK school community tree-planting initiative and established the "Project: Planet Rebuild" program. In this way, *Cohort* aims to plant 2,500 trees by 2025 to offset carbon emissions from its business activities, including daily and simple ones such as free coffee and tea offered to their guests [43]. This project also allows tourists to acknowledge the environmental consequences of their travels; the hostel plants a tree for each guest checking in. In return, visitors can purchase other trees to additionally offset their stay. *Impact Beach House* also guarantees 100% CO2 emissions compensation through offsetting schemes and intends to become a CN business by 2030. *Stayokay* seeks to meet the same target by 2050 and has already reached a 40% carbon footprint reduction in five years [44].

Figure 11: Backyard garden of The Yard Hostel (Hostelworld, 2023)

The final actions in this subcategory are gardening or green optimization, which are manageable and efficient ways to improve the health of a hostel's environmental surroundings wherever possible. Green optimization

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[42] Carbon Footprint Ltd. is an environmental consulting firm that assists other businesses in their efforts to minimize carbon emissions and energy costs. It provides guidance to achieve Net-Zero strategies, an online platform for organizing data and targets, and sustainability and community-care projects to offset CO2 (Carbon Footprint Ltd, s.d.).

[43] The Cohort hostel website page dedicated to the "Project: Planet Rebuild" program provides an example to help readers understand the extent of a business's environmental impact by writing: "Yes, even the 'free' tea and coffee comes with a hefty price tag - 1kg of coffee creates 15.33kg of CO2!"; this illustrates why they offset even the carbon footprint of their welcome drinks (Cohort St Ives, 2021).

[44] Stayokay notes on its sustainability webpage that its carbon footprint was 0.92 kg per overnight stay in 2018 and dropped to 0.55 kg in 2022, representing a 40% reduction (Stayokay, s.d.).

increases air and living quality while reducing noise, and it may even be used to implement a circular system. Part of the exterior area from which *The Yard* derives its name was described by Hostelworld as a "leafy green space", which is not so common in a large city like Bangkok (2023). Moreover, *Impact Beach House* grows vegetables and herbs in its garden. Both *Cocomama* and some *Stayokay* hostels use grass roofs for eco-isolation. The latter also preserves biodiversity through the BeeOkay project, which provides a "hostel" (as ironically stated on their website) for bees and other insects as well.

3.3.3   Return recovered biological resources to the biosphere

Composting is the action included in this subcategory which is also related to the last gardening/green optimization analysis and can become part of the loop dimension if there is a vegetable garden where a compost heap can provide fertilizer to grow food for the hostel's guests. *Impact Beach House*, *The Yard*, and *Cocomama* all compost their kitchen scraps. In addition, the first hostel is a "Community Composting Spot", which means it gathers compost from locals to better dispose of it.

3.4 Share

The share dimension includes all processes to maximize product or service utilization when multiple consumers use an asset at the same moment or at different times throughout its lifecycle. The revised ReSOLVE framework, which is hereby applied, classifies "sharing" into the same subcategories as the EMF methodology: shared assets, reuse/second-hand, and methods to extend asset life.

SHARE
Share assets
- Community-based lifestyle
- Coworking space
- Repair/Exchange Center
- (Responsible) group tourism experiences
- Leasing

Reuse/Secondhand
Prolong life through maintenance, design for durability, upgradability
- Upgradability/Upcycling

Figure 12: Share Dimension

3.4.1   *Share assets*

This first subclass of the sharing dimension is especially relevant to the analyzed industry. The hostel concept is rooted in sharing economy principles, as it is all about experiencing hospitality with others: sleeping in a dormitory bunk bed with fellow guests, using a common bathroom, cooking a meal in a shared kitchen, and meeting travelers in the communal areas. These aspects are not addressed in the case study research because they are viewed as an inherent part of this specific lodging class and are typically present in all hostels, albeit with certain exclusions and in varying forms[45]. The sharing practices searched for in the case studies are those that provide a further level of peer-to-peer experience, emphasizing the efficiency and effectiveness of hostel shared spaces . The "community-based lifestyle" is included to examine how businesses in this industry can gain from having many people share an experience under the same roof while also extending these benefits to the local community. Making a hostel more local increases its customer base by involving residents, enhances the guest experience by making them feel more included, and ultimately improves the company's image[46] and reputation. *The*

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[45] For instance, some hostels may not have a fully equipped kitchen for guests. Additionally, bathrooms can either be located in the floor corridor, accessible to all visitors, or else they can be incorporated within the dorm, which would restrict their usage to only those staying in that specific room.

[46] The term "brand image" refers to the pattern of associations that consumers hold in their minds, representing their perception of the brand. It is shaped by various

72

Yard already communicates its belief in this concept in the Thai meaning of the name, which is "family", suggesting that a guest can feel at home at the hostel. Moreover, it has also implemented sharing principles through various local collaborations with "The Front Yard" initiative, which is an area at the hostel doorstep that is open to locals and guests and features stores, cafés, and restaurants. This project will be further developed in the exchange dimension. The bistro of *Madama* is the meeting point for the community and travelers, and many events are organized there, from acoustic concerts to art exhibitions. *Stayokay* collaborates with the "Join Us"[47] association to improve the inclusiveness of its hostels and stimulate social interactions among young people.

Moving forward with the classification, coworking spaces within the hostels' perimeters were examined. Coworking has become one of the most common ways to improve a hostel's offer especially in response to the recent surge in digital nomadism[48]. It is also a great approach to use the sharing economy's pay-per-access fee to expand its consumer base beyond those who stay at the hostel; with this concept, anyone who needs a "temporary office" can access a workplace with Wi-Fi connectivity. *Impact Beach House, The Yard* and *Madama* all offer coworking spaces. The latter defines it on its website as the "Smart Hub" accessible 7 days a week with a non-fixed office seat, water, and

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connotations, some of which are beyond the brand's control. Therefore, a company needs to focus on improving its brand image to attract its target audience. To achieve this, the brand's identity must be consistently communicated to reinforce its image (Keller, Busacca, & Ostillio, 2005).

[47] "Join Us" is a foundation to support young generations experiencing loneliness and coping with related mental health difficulties. It operates in 77 different Dutch communities and is supported by the Netherlands Ministry of Health, Welfare, and Sport (Join Us, 2024).

[48] A digital nomad is someone who travels while working remotely. HW first noted interest in work flexibility and its impact on hostel expansion potential in 2017, and it has grown in the post-pandemic years, allowing some hostels to redefine parts of their spaces to fit these travellers' needs and offer coworking areas (Hostelworld, 2017) ; (Hostelworld, 2021).

Wi-Fi for a daily fee or with a multi-entry membership. It is also possible to work in the Bistrot with consumption.

A repair/exchange center is another creative possible development of a hostel space. These lodging facilities are generally favored by travelers, such as backpackers, who only need to bring the essentials with them. Some guests leave behind various belongings, such as clothing, resulting in plenty of lost and found items. This option offers the possibility of turning something that could be an inconvenience into an opportunity, such as organizing charitable and swap events with the community or even implementing an "exchange center" dedicated to giving those items a second life. These ideas might be extended to the community by developing a "repair center" where people can gather and share their skills to fix what is damaged or may be upgraded, much like the "repair café"[49] trend is suggesting. Such a project requires a workstation space equipped with the tools necessary to repair a bit of everything, which a hostel already has for maintenance purposes and could thereby

Figure 13: The Swap Spot at Impact Beach House *Hostel (Impactrip, s.d.)*

maximize their use. *Impact Beach House* provides excellent examples of the various projects that may be carried out in this sharing category. There is a "Swap Spot" where guests can exchange their clothing for those displayed in a remanufactured old cabinet. The hostel is also the headquarters of R-Coat, a community-based brand that upcycles

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[49] The repair café concept is particularly popular in Nordic countries, such as Sweden, where government regulations encourage reuse by lowering taxes to promote CE approaches. These initiatives also offer job opportunities for anyone with "fix-it" skills. An array of products can generally be repaired, including home appliances and damaged clothing (Non Sprecare, 2024).

broken umbrellas into raincoats (R-Coat, s.d.). Moreover, *Impact Beach House* implemented the "Ponto electrão", an "Electronic Point" where anyone can leave malfunctioning devices so that their components will be properly recycled. *Stayokay* provides another interesting application of the asset-sharing approach. The hostel, in partnership with the Kinderzwerfboek association[50], displays "stray books" for children to take, read, and then leave somewhere new for others to find. Finally, *Cocomama* auctions or donates lost and found items to charity.

The following category under the "share assets" section covers tourism experiences offered or supported by hostels in partnership with providers that enhance the visitors' opportunities to discover the place, ideally with an authentic, local, and responsible approach. It should be part of a HI circular economy strategy to ensure clients have an overall sustainable experience once they arrive at the lodging facility. This is particularly relevant when the hostel is in a non-tourist location where STD can be promoted to increase the community's social, cultural, and artisanal visibility. Thus, "(responsible) group tourism experiences" measures were analyzed among the six hostel businesses. As the brackets indicate, the term "responsible" is included but not meant to be limiting. Offering directly managed, and valuable responsible tourism experiences demands a hostel to adopt an additional and distinct business model, as well as considerable administrative and organizational adjustments. Meanwhile, finding sustainable partnerships to provide this service can be challenging. Therefore, the provision of standard tourism activities is still considered valuable in

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[50] The Kinderzwerfboek association believes in the importance of reading for children's development and works to ensure that every child has access to a book to read. The first "stray book" began wandering through the Netherlands in 2010, waiting for a young temporary owner to pick it up and release it once read. The project is now supported by various partners, ensuring that books are held at several stations throughout the region, as well as in countries such as Luxembourg and Austria (Kinderzwerfboek, 2018).

improving the overall shared experience with other hostel guests and boosting destination opportunities. *Impact Beach House* was able to address both challenges; it evolved from a volunteer house, and it is a project of the social enterprise ImpacTrip, whose first mission is to combine travel experiences with positive social and environmental impact (Impactrip, 2022). With this background, and thanks to the main enterprise support, together with valuable local partnerships, the hostel may provide their guests with eco-activities, ocean conservation projects, and workshops. *Cohort* and *Cocomama* both collaborate with local guides to create tours and activities, with the former providing walking and cycling tours. *Stayokay* offers their guests upcycling courses, cooking classes, and other unique ways to promote sustainability, such as oyster mushroom farming experiences.

The subcategory of shared assets closes with leasing operations. Leasing can be an interesting option for a hostel because it helps maintain a low-price offer by limiting the free access of certain services to the dorm's guests and including them only for higher-paying customers who stay in private rooms. Towels, shampoo, body wash, and additional pillows are some examples of such products. The lease comes in handy when guests staying in shared rooms wish to use those items. Most of the examined hostels rent towels on request, with *Stayokay* and *Madama* charging € 3.00. The latter and *Cohort* on their websites also mention the leasing of padlocks, with *Madama* charging €5.00. Indeed, every dorm should have a locker or equivalent space where guests can safely store their most valuable belongings. *Stayokay, The Yard*, and *Cocomama* also offer bike renting, thereby encouraging sustainable means of transport and promoting a healthy lifestyle.

3.4.2   Reuse/Second-hand

This subcategory of the sharing dimension includes second-hand or reused items, such as products or materials that are not new, have been previously used, and can be redistributed to new users in their original state or with minor changes (Ellen MacArthur Foundation, s.d.). Except for *Cohort*, every analyzed hostel incorporates second-hand or reused decoration and furniture to design their interiors. *Cocomama* has a bed linen and towel reuse program, and *The Yard* has bedsheets, pillowcases, duvets, and curtains made of surplus fabric.

3.4.3   Prolong life through maintenance, design for durability, upgradability

Figure 14: Reception desk made of Ikea's surplus bed frames at Impact Beach House Hostel (Impactrip, s.d.)

The final measures addressed in the sharing dimension are connected to improving and extending asset life. The practices that appear to be most frequently used by hostels in this area are upgradability and upcycling techniques. These two can be differentiated by the reuse/second-hand category because they present the additional intention of transforming the original product or component materials into better-quality and higher-value ones (Legrand, Chen, & Laeis, 2023).

Examples of such applications include the welcome desk of *Cocomama*, built of vintage books and upcycled materials, and the one of *Impact Beach House*, made with Ikea's surplus bed frames. Finally, *Stayokay* repurposes worn-out employee shirts into new ones.

3.5 Optimize

This dimension encompasses all actions that can improve performance and increase operational efficiency while minimizing resource usage and aiming to eliminate waste whenever possible. Thus, the first subcategory considered in the EMF framework, "Increase performance/efficiency", is maintained in the analysis, whereas the second is expanded to include not only measures that eliminate waste but also those that limit it. Instead, the last subcategory considered in the EMF framework, "Leverage big data, automation, remote sensing and steering," was incorporated in the "virtualize" dimension to emphasize its digital aspect. In its place, another element that is critical to optimizing a CE business model was analyzed, namely the supply chain. Since hostels generally provide both lodging and dining services, the subcategories "choose supply chain" and "choose food chain" were both examined. The additional actions' categorization was developed by understanding the six-hostels' most frequently employed measures, which will then be used to better define the overall optimize dimension.
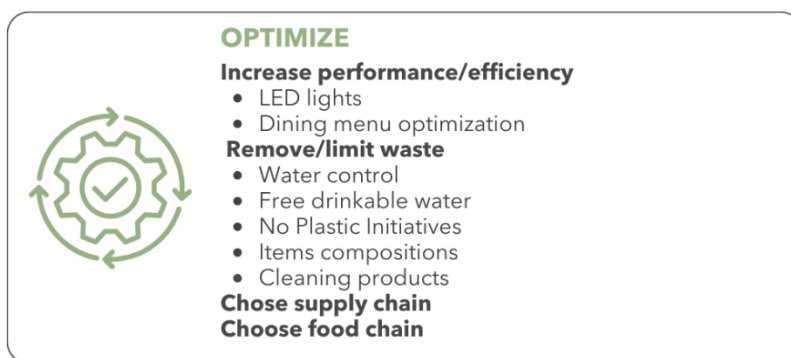

Figure 15: Optimize Dimension

3.5.1 *Increase performance/efficiency*

LED lighting installation is an example of measures that can be implemented under this subcategory to increase illumination performance. This technology is used by all analyzed hostels, and it is considerably more energy efficient, cheaper and long-lasting than

standard incandescent light bulbs (Arup, 2016). Moreover, some of the analyzed case studies show how "dining menu optimization" can also lead to improved performance and efficiency. As will be highlighted in the "Choose food chain" section, most of the assessed hostels offer their guests locally sourced and produced food. The selection of local providers is already a way to improve the restaurant service for the hostel's visitors because, in this way, fresh ingredients are more easily obtained, can be restocked more frequently, and are of higher quality. Furthermore, offering a simple yet varied menu to meet their clients' dietary requirements is another way to enhance the dining experience. As a result, *Madama*, *Stayokay*, and *Impact Beach House* all provide vegetarian and vegan options, with the latter serving only plant-based meals on Veggie Fridays. Managing the amount of food offered is another technique to make food preparation more efficient in hostel kitchens and reduce residual waste. *The Yard* provides breakfast sets for each guest, while *Stayokay* offers buffet service but encourages customers to take smaller portions to avoid leftovers and waste. Of course, both hostels are more than willing to prepare an extra round, but their initiatives encourage customers to take more accountability for their food.

3.5.2   *Remove/limit waste*

As noted in the first chapter dedicated to the concept of circular economy, one of the three principles defining this paradigm, as envisioned by EMF, involves the optimization of system efficiency through the elimination of waste. As a result, this subcategory of the optimize dimension is dedicated to the different ways in which waste can be avoided in a hostel, and when this is not possible, other steps can be taken to limit it. Water consumption is one of the most wasteful aspects of HI; hence, this study examines measures to control the usage of this fundamental and scarce resource. With the exception of

Impact Beach House, all case studies describe how they limit their intake of water. *Madama*, *Cocomama, Cohort*, and *The Yard* have fitted water-saving shower devices, with the first three additionally having water-saving toilets. *Stayokay* also takes steps to reduce the consumption of this resource, such as selecting company clothing producers and laundry suppliers who implement sustainable practices. Moreover, all of the aforementioned ensure that guests have free and safe access to this resource by providing filtered tap water or refilling points in community areas. If visitors do not have their own, *The Yard* offers reusable glass bottles upon check-in, and *Stayokay* sells Doppers[51] at the reception desk to discourage plastic single-use containers.

'SINGING WHILE SHOWERING IS GREAT, BUT SAVE YOUR VOICE AND THE WATER A BIT!'

Figure 16: Environmental communication on Stayokay website (Stayokay, s.d.)

This measure is also related to the next set of actions examined: "No Plastic Initiatives". In this regard, *Cohort, Madama, Cocomama, and The Yard* ban single-use plastic items. The first hostel launched the "Skip the Plastic campaign" to improve its intervention which includes applying compostable liners only in communal bins and not in bedrooms and ensuring that all plastic wrapping is returned to the linen firm for recycling. *Cohort* established the "St Ives Plastic Free Campaign" in collaboration with other local businesses to pursue community activities and reduce the usage of this polluting material. Saying no to plastic can also be accomplished by choosing wisely the packaging and composition of products, which are two other measures discussed in the analysis. Alternative and less impactful materials for manufacturing everyday goods, packing, or securely preserving are

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[51] Dopper is a reusable water bottle brand. In 2022, the company received the Cradle to Cradle certification for all its assortment of products (Dopper, s.d.)

now being improved, and incorporating those in hostel operations contributes to reducing waste. Madama's Bistrot, for example, uses solely biodegradable and organic cutlery, plates, and other disposables for its takeaway. The hostel also provides napkins made from recycled paper. At *Cohort* and *Cocomama* bathrooms, there is only recycled toilet paper, and the first even stores cleaning products in refill containers. Other analyzed measures undertaken to optimize the compositions of items throughout the building are presented by *Stayokay*, which provides eco-friendly shampoo and body wash in some of its

Figure 17: Refill containers for cleaning products at Cohort hostel (Cohort St. Ives, 2022)

hostels, and *Cohort*, which enables its guests to sleep on mattresses produced from recycled foam with a cover made from traceable recycled and 100% recyclable plastic. The final waste-reduction step advocated by all hostels, except for *The Yard*, is the use of sustainable cleaning products that contaminate less; these agents may be biodegradable, ecolabel certified[52], or simply more eco-friendly.

3.5.3   Choose supply chain

As discussed in the second chapter, tourism is built out of multiple interrelated supply chains and consequently linked to other key industries such as food and construction. This precondition is, of course, relevant for the HI and its niche sector of hostels. As a result, among the most challenging yet essential factors to consider   to

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[52] Ecolabels are certification schemes that place a strong emphasis on environmental management and sustainability. The Global Ecolabelling Network defines this form of accreditation as representing the overall, verified environmental value of a product or service within a specific category (Legrand, Chen, & Laeis, 2023).

strategically build or shift to a CE model is the careful selection of suppliers to whom they can refer to further develop the loop chain that they have started. For example, for a hostel to apply CE to its building, it may require a construction industry that considers circular design and systems, as well as suppliers who propose restoration strategies, purchasing items made with longevity in mind, and finding providers who can deliver everyday operational products and services to shape the hostel's offer with as little environmental and social impact as possible. All these factors, as well as many others, involve organization and strategy to create an overall efficient circular project. If a hostel does not have local suppliers who follow similar principles of sustainable development or are proactive about driving innovative change, it would be almost unattainable for this HI business to achieve a high standard of circularity. That is why, while assessing the six case studies for references to this specific subcategory of the optimize dimension, their effort to establish a network of local, sustainable, and possibly circular suppliers was evident. All the hostels considered show an intention for the continuous improvement of their supply and food chain, with a preference for local, certified, and non-profit suppliers whenever possible. *Madama* expresses its hostel's creative side by referring to artists for some items manufacturing. *Cohort* employs non-fossil fuel-intensive products, such as bamboo-made ones. Both this business and *Stayokay* opt for an outsourced linen company that minimizes its environmental impact. Furthermore, *Cocomama* has an interesting selection of green providers, such as Coco-mat[53], which makes mattresses, pillows, and other home furnishings with natural

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[53] COCO-MAT is a Greek company formed in 1989 that creates handcrafted products for sleeping, manufactured exclusively of natural materials, using sustainable processes. The brand specializes in mattress sales and has a network of shops in over 20 countries. It has also expanded into the hospitality industry by opening hotels in four different locations in Greece (Coco-Mat, s.d.).

materials, and The Good Roll[54], which sells fully sustainable toilet paper. Finally, *Stayokay* chose the MUD Jeans brand to create their recyclable company trousers out of 100% organic cotton under fair conditions[55].

3.5.4   *Choose food chain*

The same attention that is provided to the suppliers' network should be emphasized for food and drink-related provision, especially within a HI scenario such as hostels, where an important element of a guest's stay is connected to the dining offer. In this regard, *Cocomama*, *The Yard*, *Impact Beach House*, and *Stayokay* all strive to offer local options on their menus, using fresh, organic, and seasonal ingredients. The first hostel additionally notes that 80% of its food is locally produced, and some is fair trade. The latter provides some ethically made meals, including meat from certified producers or halal. *The Yard* serves coffee prepared with beans sourced from sustainable local farmers and roasted by a neighborhood café. Furthermore, *Stayokay*'s menus feature a selection of products made from food that would otherwise

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[54] The Good Roll is a Dutch firm that sells "100% tree-friendly and sustainable toilet rolls" produced from European recycled paper, free of colorants, and scents. The business's concept originated as a response to the environmental impact of this production system, which requires 27,000 trees to be cut down every day. The company also has the social aim of addressing the reality that one-third of the world's population lacks access to safe and hygienic toilets, and it donates 50% of its net profit to an African project for constructing toilets (The Good Roll, s.d.)

[55] Stayokay explains on its website that a pair of jeans can require up to 7000 liters of water to produce, which shows the environmental impact of this particular clothing. As a result, they choose to purchase exclusively recyclable jeans as part of the company attire set to reduce material waste and water use (Stayokay, s.d.).

be discarded, such as jams by Twisted Jams [56] and soup produced by the Wastage Factory [57].

3.6 Loop

The loop dimension, as its name suggests, best expresses CE closed-loop method for retaining item value. It includes inner and more efficient loops such as remanufacturing, that are favored over outer loops like recycling, which are still required as a last recourse to properly dispose of materials. These two subcategories, remanufacturing and recycling, are also included in the original ReSOLVE method and have been incorporated into the revised framework. The loop dimension is also the one that most closely resembles the butterfly diagram (v.; Figure 1), in which renewable materials can be organically processed throughout the biological cycle. For this analysis, "anaerobic digestion"[58] and the "extraction of bio-chemicals from organic waste" which are subtopics of the EMF method, are combined into a subcategory more permanent to the case studies defined as the "Food Waste Loop". It encompasses all actions that can be taken to close the circle of food and use natural components, obtained through composting, to create nutrients or other forms of energy. An extra subcategory that was also included is "Modular Construction and Design", which aims to make building materials more adaptable, versatile, and easily reusable and is particularly relevant for

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[56] Twisted Jam is a Dutch company that presents alternative uses for fruits and vegetables that are discarded during the selection process due to their shape and size. The company produces sustainably hand-made jams from these still-fresh and usable ingredients.

[57] The Wastage Factory is a social enterprise committed to tackling the issue of food that is wasted before it even reaches people's tables, which accounts for one-third of total global production. It produces soups and sauces from surplus, primarily vegetables, and fruits sourced from distributors, farmers, and food companies. The business extends 75% of its job opportunities to people with a distance to the labor market (De Verspillings Fabriek, 2021).

[58] Anaerobic digestion "involves the decomposition of organic material in the absence of oxygen using microorganisms, which generates biogas and a digestate" (Arup, 2016, p. 89)

the hostel sector, where the property is an important physical asset of the business.

LOOP
Remanufactured/Refurbished products or components
Recycle materials
Food waste loop
Modular Construction and Design

Figure 18: Loop Dimension

3.6.1   *Remanufactured/ Refurbished products or components*

Remanufacturing and refurbishment are two distinct processes that aim to restore the value of a product. Remanufacturing involves disassembling the product down to its component level, replacing any defective parts, and then rebuilding it to its original condition. In this way, it can be presented as a new product. On the other hand, refurbishment is mainly an exterior process in which the product is repaired to the best possible condition, usually without disassembling it (Ellen MacArthur Foundation, 2019). The distinction between the two techniques and others with similar goals, such as reuse and upcycling, already discussed and classified under the optimize dimension, can be subtle at times, and it is challenging to tell which one was used solely based on the online information provided. This aspect is also influenced by businesses' interpretation of the methods of circular economy available to restore the value of a product. Given these considerations, the only two examples provided within this subcategory are the following. *Madama* equipped the hostel with furniture crafted by local artists using recovered components and certified raw materials from responsibly managed forests. Finally, whenever *Stayokay* renovates one of its hostels' buildings, it favors using remanufactured furniture if possible.

3.6.2 *Recycle materials*

This subcategory refers to the last favored loop measure of CE: recycling. It is the process that returns a product or component to its basic material level so that it can be reused, at least partially, in new products (Ellen MacArthur Foundation, 2019). It entails the loss of some of the embedded material, labor, energy, and financial resources, and whatever is obtained as a result is less valuable than the product in the first place (2019). These are some of the reasons CE business models favor the implementation of more inner-loop systems over recycling. Nonetheless, the latter will remain a crucial process as long as CE does not become a widely adopted model and waste is not removed from the equation. Waste management is nowadays influenced by government-mandated collection, taxation, and other regulations. That is why, in a location attended by multicultural people, it is critical to inform them about the local recycling process with clearly labeled differentiated bins. All the hostels in the case studies recycle their waste. Some specify what and how they separate, such as *Cocomama*, which recycles metal and aluminum cans, glass bottles and jars, carton, paper and cardboard, plastic bottles and containers, and even batteries. Additionally, *Stayokay* separates frying fat to transform it into energy, as will be explained in the "Food waste loop" section. *Madama* has recycling bins in every room, including dorms, thus encouraging guests to be more conscious of their waste and to avoid throwing it in the undifferentiated waste collection just for convenience. Similarly, *Cohort* ensures that recycling containers are located throughout the building.

3.6.3 *Food waste loop*

When it comes to food, the first and most important objective is to avoid waste. In the "dining menu optimization" section, methods for efficiently organizing the offer and preventing leftovers were examined.

At the same time, it was possible to observe how many of the six hostels composted their scraps. This aspect of the regenerate dimension can be developed in a "food waste loop" by converting it into fertilizer to grow vegetables that can then be returned to the plate, completing the circle. *Impact Beach House* attains this process by vermicomposting[59], and converting all compostable waste into nutrients for the soil of their garden, where new ingredients are grown and cooked for the guests' meals. This ensures that the hostel provides a fresh assortment of food. If something cannot be processed in this loop, the company finds another way to make it useful. For instance, organic waste is collected by the municipality to create biomass energy. The potential for extracting valuable biochemicals, power, and nutrients from various waste streams

Figure 19: Food Waste Loop at Impact Beach House Hostel (Impactrip, 2022)

is significant. *Stayokay* takes a similar approach by collecting deep-fried fat, which is subsequently converted into biodiesel, a sustainable fuel. The hostel chain also collects coffee grounds and uses them as fertilizer for plants and to cultivate oyster mushrooms. As described in

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[59] Vermiculture is the process of growing earthworms on organic waste to enrich the soil and produce vermicompost, a fertilizer. Earthworms naturally plow the ground by digging tunnels, they ingest and digest the organic waste that accumulates, which can then be decomposed into simpler compounds. The substance expelled by earthworms in this process undergoes an enzymatic interaction with soil microorganisms, resulting in a natural fertilizer that does not require treatment and can be used directly for plant nutrition. In addition, vermicomposting improves soil aeration, drainage, and water retention capacity (AgroNotizie, 2021).

the section on responsible tourism experiences, this project also allows the business to promote environmentally conscious practices with customers.

3.6.4 *Modular Construction and Design*

Circularly designed buildings implement looping systems and non-toxic materials, as well as flexible and modular solutions (Ellen MacArthur Foundation, 2015). Modularity means using components that are

Figure 20: Rooms built from old shipping containers at The Yard Hostel (Hostelworld, s.d.)

durable and can be disassembled and reused (Iyer-Raniga, 2019). Whenever a business is settled in an already existing building and structure intervention is limited, there are other ways similar measures can be applied. For example, *The Yard* obtained rooms from old shipping containers. *Stayokay* offers experiential stays in some of its locations surrounded by nature where guests may rent tiny houses, called Wikkelhouses, made of recycled cardboard layers (Stay the night in a Wikkelhouse, s.d.). In this way, the hostels repurposed something, optimized their outside areas to be able to sell more beds, and offered a unique and sustainable experience to guests. Another interesting project realized by *Stayokay* involves the development of one of its hostels from the renovation of a famous building in Rotterdam called "Cube Houses". The structure is composed of 38 small cubes connected to a basement section (ArchDaily, 2009). The Dutch architect, Piet Blom, first realized each cubic module in Helmond, in the

Southern Netherlands, as a representation of a tree's geometrization (Editoriale Domus Spa, 2023). These structures were later reused in Rotterdam and juxtaposed, resulting in an architectural transposition of an urban forest (2023).

Figure 21: Stayokay Hostel in the "Cube Houses" building in Rotterdam (Stayokay, s.d.)

3.7 Virtualize

While presenting the CE principle of "Eliminate waste and pollution" in the first chapter, one of its possible applications was provided, which is actually related to the virtualize dimension: deliver utility virtually, via technology, whenever possible (Ellen MacArthur Foundation, 2015). There are several techniques to develop this category, and the EMF framework grouped them into two main sets of actions: the ones that allow direct dematerialization, such as rendering books, music, and other forms of online entertainment, and those that allow dematerialization indirectly, involving primarily delivering services or products remotely, such as online shopping platforms. Given that hostels are still strongly reliant on the provision of physical assets to accommodate guests while also experiencing intangible aspects such as inclusion, community, and the "home-away-from-home" feelings sought by travelers, this dimension is investigated to consider opportunities for optimizing hostel characteristics through virtualization. To accomplish this, three major subcategories are

considered under this dimension: smart monitoring systems, innovative network and Internet usage, and finally sharing platforms.

Figure 22: Virtualize Dimension

3.7.1 Smart Monitoring Systems

Smart Monitoring Systems involve the use of intelligent solutions to facilitate tasks that typically involve physical intervention or to manage systems more efficiently and digitally (Iyer-Raniga, 2019). In this regard, most analyzed hostels implement actions to control resource utilization throughout their buildings. *Cohort*, *Cocomama*, and *The Yard* employ lighting motion sensors in corridors and halls, while the first hostel additionally employs the same technology for shower taps and has an energy monitoring system to reduce electricity consumption. *Cocomama* provides visitors with smart key cards to access energy-consuming equipment such as lighting in their rooms. *Madama*, located in Milan, a city notorious for its poor air quality, installed a pollution control system outside its building that controls fine particle emissions. Finally, *Stayokay* implemented an interesting technology that also pertains to the "dining menu optimization" section: Orbisk, a smart machine that measures what food is thrown away, at what time, and in what percentage to better adjust food offerings to guests' eating habits. *Stayokay* estimated that it averted 2,803 kg of food waste over six months in 2023 (Stayokay, s.d.)*.*

3.7.2 Innovative network and internet usage

For hostels, digital technology can provide virtual spaces to communicate with potential customers, exchange information before, during, and after their stay, provide activities to enrich their journey, and build partnerships with related product and service providers. All six case studies implement digitization to enhance their offerings. The most common concept in this subcategory, shared by *The Yard, Stayokay, Cohort, and Cocomama*, is to manage and keep updated the hostel's online blog page, where visitors can find local travel tips. In fact, one of the characteristics of this type of lodging that guests value

Figure 23: A section of Madama Hostel's personalized map of Milan (Madama Hostel & Bistrot, 2023)

is the ability to engage with the staff in an informal manner, which facilitates a more in-depth understanding of the visitor's interests and customized suggestions. Local information about how to better explore the surrounding areas can be digitalized to make this process more accessible and efficient. *The Yard*, for example, gives expert travel advice in its blog, and *Madama* made this concept its own by creating a digital map of Milan tailored to their hostelers' needs. Finally, as previously observed, *Impact Beach House* is a project of the parent firm ImpacTrip, a tour operator that provides travel experiences with a positive social and environmental impact. These businesses' organizations enable the hostel to specialize in welcoming volunteers who booked their responsible holiday through their collaborative website page.

3.7.3   *Sharing platforms*

Social platforms represent another digitalization tool for implementing shared and circular business strategies (Florido, Jacob, & Payeras, 2019). In the second paragraph, the Too Good to Go network was defined as an example of the sharing economy concept, which allows people to receive, give, or share access to goods and services via community-based online resources (Hamari, Sjöklint, & Ukkonen, 2015). *Madama, The Yard, and Stayokay* hostels all employ the "Too Good To Go" app to give food that would otherwise go to waste a second chance. Another interesting use of a sharing platform is *Cocomama*'s travel experiences account on the "Get Your Guide" website. The latter began as a peer-to-peer digital space that connects tourists who want to discover a destination more authentically with amateur local guides. It has since expanded to include professional guides who can provide better visibility for the experiences they propose (Get Your Guide, s.d.).

3.8 **Exchange**

The EMF original ReSOLVE framework considers the exchange dimension as a way to replace the old with the new: non-renewable materials with renewable items, employing advanced technologies, and choosing a new product/service , for example, buying an electrical car instead of one powered by gasoline. The exchange section is viewed in this research more as an "interchange" rather than a "switching" connotation. In this way, the dimension may encompass factors considered essential for the analyzed industry application of CE. Foremost, there is the aspect of the reciprocated value that a hostel gives to the guests and the community for sharing and acting on sustainable development goals. Furthermore, the cooperation necessary to build circular economy flourishes thanks to the

development of partnerships with local businesses and other organizations. Finally, a CE company must cherish its intangible human aspect, which is particularly important in a hostel business where socialization is an integral part of the guest experience. Thus, staff and related working measures included in the final subcategory will be examined in this dimension.

EXCHANGE
Environmentally conscious practices with guests
Social projects for and with (local) community
Network and Partnerships
- Local Business partnership
- Organization partnership

Work Organization
- Staff training and incentives
- Volunteer opportunities

Figure 24: Exchange Dimension

3.8.1 *Environmentally conscious practices with guests*

Guests may participate in the process of integrating CE or SD practices into a HI enterprise. Environmental communication should be clear in terms of letting guests understand what procedures the business is following in this regard, and once the guest experience has begun, environmental education can be used to help visitors enrich their sustainable behavior. All the examined hostels engage in green initiatives with their guests. *Impact Beach House* demonstrates its commitment to a sustainable and circular strategy by raising hostel guests' awareness of values such as solidarity, cooperation, and equality through a variety of programs promoting a more sustainable lifestyle. *Madama* organizes monthly awareness activities on resource and waste management and environmental conservation. Another example of how to make guests more conscious of their choices when traveling is offered by *Cocomama*, which allows hostelers to opt out of daily room cleaning. Finally, most hostels use communication both

online and inside the building to demonstrate their serious environmental commitment, but in an original and catchy style to boost engagement. This is noticeable in some pictures already presented in this chapter, such as Figure 10, Figure 16, and hereby Figure 25.

Figure 25: Sustainable solutions for Rotterdam Hostel explained on Stayokay's website (Stayokay, s.d.)

3.8.2   *Social projects for and with (local) community*

Hostels, as previously discussed under the "community-based lifestyle" section of the sharing dimension, are fundamentally tied to the local community where they operate. As a matter of fact, travelers who choose this type of accommodation seek out an authentic experience that can only be attained through a strong connection to the people who live in the surrounding area. This provides an opportunity to express the company's values and image through various projects realized with the support of the community and possibly for it, and ultimately for the destination's sustainable development. All case studies implement this subcategory. *The Yard* donates 7% of its direct bookings to the Karen Tribe in Northern Thailand. This community is affected by air pollution and forest fires, and they help to prevent the latter by cutting down dead trees and preparing rainwater containers. *Madama* supports the "Neighborhood Hen House Project," which was launched by Milan Politecnico University and some agroforestry organizations to provide a responsible and sustainable local home for

94

chickens. The hostel adopted four hens, providing the Bistrot with fresh, ethically produced eggs. Finally, *Cocomama* is a member of the "Mensen Maken Amsterdam" a neighborhood organization that works to make the city greener, safer, and cleaner.

3.8.3   Network and Partnerships

A fundamental premise discussed in this research is that CE requires systemic change, which becomes attainable through a network of agents collaborating for sustainable development. As a result, fostering business and organizational connections is essential to achieving and maintaining circularity. The relevance of this aspect to the hostel sector has already been presented in the section dedicated to food and supply chains. Partnerships with local businesses for a hostel mean providing a more comprehensive set of services to its guests while

Figure 26: "The Front Yard" community area in front of The Yard Hostel (The Yard, s.d.)

working together toward similar goals. *The Yard*'s collaboration with neighborhood enterprises to develop "The Front Yard" is an excellent example of networking benefits. This open space is filled with various stalls, including cafés, restaurants, a record store, a tailored shirt shop, and even a nail salon. It is a space designed and created with the community, the guests, and the staff in mind. *Madama* and *Cocomama* are eager to establish partnerships with local artists. The city council even acknowledged *Madama*, which features customized murals and artworks, in Milan's augmented reality street art catalog. Every month, this hostel collaborates with a street art tour organization to open its doors to people who wish to see the artwork both inside and outside.

Similarly, *Cocomama* provides an opportunity for local artists to showcase their art and talent throughout the building. Within this subcategory of the exchange dimension, *Impact Beach House's* "Eco Social Shop" is worth mentioning, as the hostels offer sustainable products and local artworks and crafts from social partners.
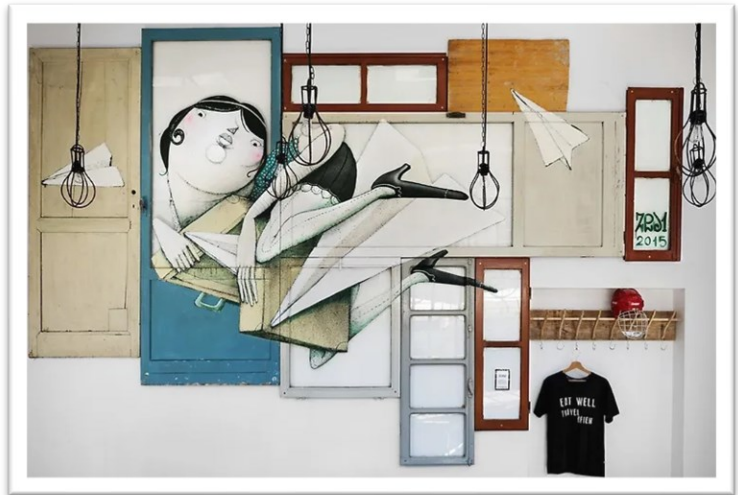

Figure 27: Mural by the street artist Zed1 at Madama Hostel and Bistrot (HotelMix, 2024)

In terms of working alongside organizations, *Stayokay* has several partnerships with entities from the academic, social, and environmental sectors. The hostel chain collaborates with a university in Amsterdam to upcycle its furniture through the "circular wood" pilot project. The business enables its lodgings to serve as experimental fields for students to suggest ideas for sustainable development with the support of an educational institution. Finally, among other valuable collaborations, the *Stayokay* board established its non-profit organization, the Stay4all Foundation, to enable children from families with limited resources to attend school camps.

3.8.4   *Work Organization*

Unlike the targeted customers of other traditional HI companies, hostelers search for a home-away-from-home experience and seek connections with like-minded people. The staff plays a vital role in supporting this natural social process by creating a welcoming and inclusive environment for travelers in hostels. Furthermore, a hostel that implements circular economy principles should take extra care in managing its essential social capital. When an innovative approach, such as CE, is developed in a business, its proper implementation by

workers should never be taken for granted, and instead, training programs should be provided to ensure that everyone knows how to handle procedures, amenities, and waste for circular flows to occur (Manniche, Larsen, & Brandt , 2017). *Cohort*, *Cocomama*, and *Stayokay* regularly involve and train employees to accomplish environmental goals. The latter implements the "Good Business programme" to let management and personnel collaborate on sustainable development projects. The "Feel Good at Work program" instead encourages the work-life balance of staff members by helping them monitor their health, exercise, eating habits, and social interaction. Furthermore, *The Yard*

Figure 28: Staff members at one of the Stayokay hostels (Stayokay, s.d.)

recognizes the importance of its employees' time off by proposing a four-day on, four-day off schedule and finding different ways to promote their personal and professional development.

A contradiction of hostels' workplace management is that, while staff members play a crucial role in providing a home-away-from-home feeling for guests, the hostel is ultimately a workplace for them, so it is equally important to remember that employees must be respected and valued as well. Volunteer programs may help a hostel in supporting its staff's work-life balance, while also fostering a sense of belonging among guests. Various online platforms promote the collaborative consumption concept of work exchange. It is also known as work travel or voluntourism, and is appealing to those who seek an economic, authentic, and extended travel experience. As a result, they offer their skills and a few hours of work per day in exchange for accommodation

and, in some cases, other benefits such as food and extra monetary compensation (Worldpackers, 2023). Travelers interested in similar volunteer opportunities have a vision and interests that are comparable to those of the target customer of a hostel, and they help create a sense of community. Online platforms that facilitate these types of exchanges offer each party a review system and customer assistance. In fact, when a non-conventional contract is in place, other sources of security must be considered. These preventive measures ensure that the partnership operates successfully and that any forms of unfairness and misconduct are avoided. Except for *Stayokay*, all the analyzed hostels are involving or have sponsored volunteer opportunities through their website or channels, such as: (Worldpackers, s.d.) ; (Workaway, s.d.) ; (Hostel Jobs, s.d.) ; (Hopper Jobs, s.d.). The widespread adoption of volunteering in the assessed hostels suggests that this, along with au-pair and exchange or swap, are traditional but still contemporary ways to interpret and realize collaborative economies, as well as successfully implement a circular vision.

Conclusions

From the comprehensive analysis of the measures implemented in each dimension and subcategory of the revised ReSOLVE Framework, several observations and conclusions can be drawn. It is important to remember that the examined measures differ significantly for various factors, including cost, time, and energy of implementation, efficacy, intrinsic value, required innovation and research. Consequently, the dimensions and related subcategories presented have different leverages and cannot be balanced without subjective bias and with unperformed efficacy through this study, which remains a qualitative analysis. As a result, the ranking presented hereafter, and shown in Figure 29 and Figure 30 was developed by checking the application or absence of CE actions for each subcategory, and only serves to translate into numbers the qualitative analysis developed in the previous chapter.

The initial observation is that all six hostels have effectively incorporated the ReSOLVE dimensions. No section appears significantly undeveloped, and the case studies cover most of the subcategories, albeit with few exceptions. According to the EMF, the compounding benefit of a CE model can be fully achieved if all the ReSOLVE levers are collectively engaged (Ellen MacArthur Foundation, 2015). Therefore, it is encouraging to see how businesses are experimenting in their distinctive ways to provide a hosteling system that adheres to CE and SD criteria.

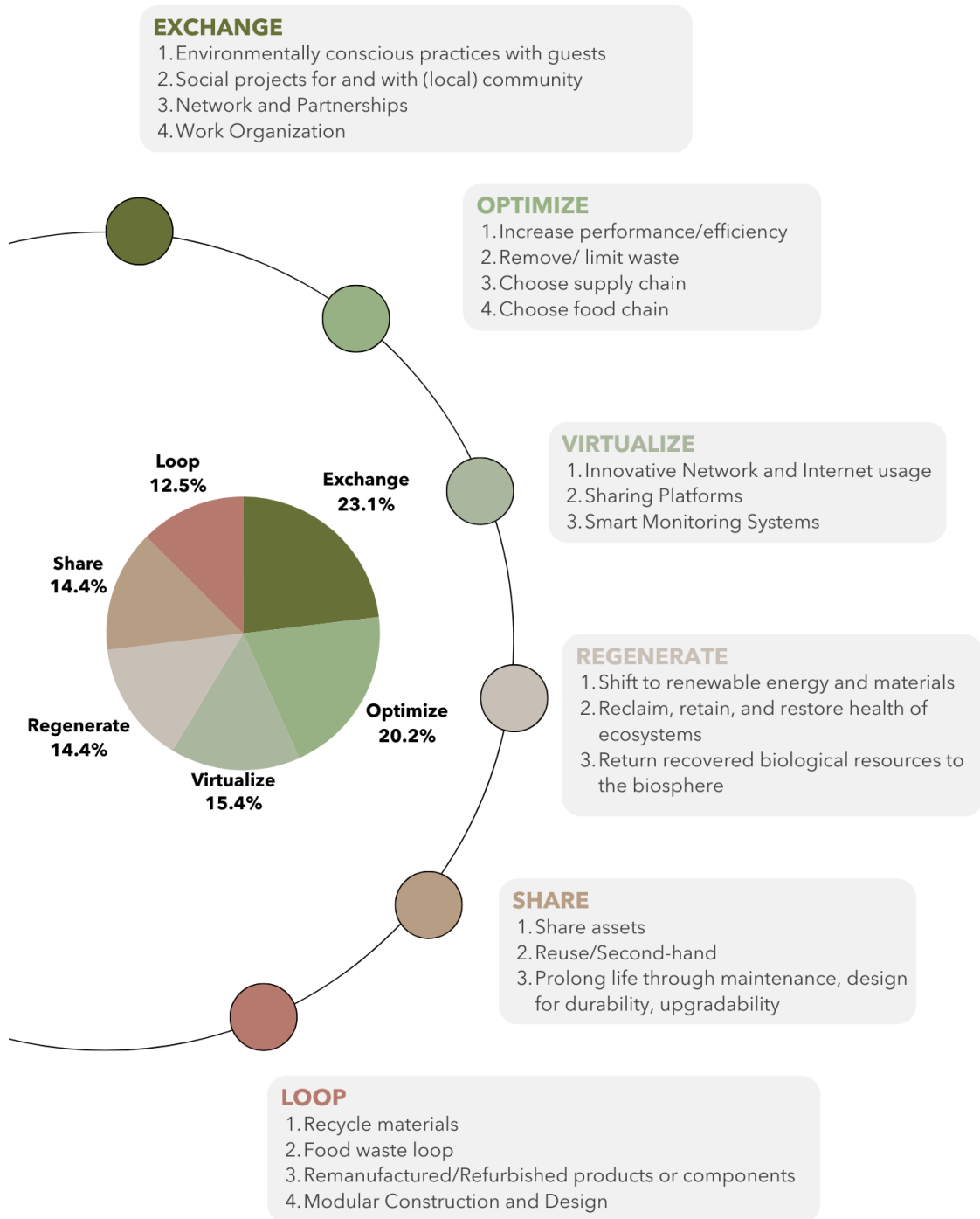**THE RESOLVE FRAMEWORK APPLIED TO THE HOSTEL SECTOR: DIMENSIONS AND SUBCATEGORIES IN RANKING ORDER**

EXCHANGE
1. Environmentally conscious practices with guests
2. Social projects for and with (local) community
3. Network and Partnerships
4. Work Organization

OPTIMIZE
1. Increase performance/efficiency
2. Remove/ limit waste
3. Choose supply chain
4. Choose food chain

VIRTUALIZE
1. Innovative Network and Internet usage
2. Sharing Platforms
3. Smart Monitoring Systems

REGENERATE
1. Shift to renewable energy and materials
2. Reclaim, retain, and restore health of ecosystems
3. Return recovered biological resources to the biosphere

SHARE
1. Share assets
2. Reuse/Second-hand
3. Prolong life through maintenance, design for durability, upgradability

LOOP
1. Recycle materials
2. Food waste loop
3. Remanufactured/Refurbished products or components
4. Modular Construction and Design

Pie chart:
- Loop 12.5%
- Exchange 23.1%
- Optimize 20.2%
- Virtualize 15.4%
- Regenerate 14.4%
- Share 14.4%

Figure 29: The ReSOLVE Framework applied to the hostel sector: dimensions and subcategories in ranking order

100

6/6 HOSTELS

- Shift to renewable energy and materials
- Share assets
- Increase performance/efficiency
- Remove/limit waste
- Recycle materials
- Innovative Network and Internet usage
- Environmentally conscious practices with guests
- Social projects for and with (local) community
- Network and Partnerships
- Work Organization

5/6 HOSTELS

- Reclaim, retain, and restore health of ecosystems
- Reuse/Second-hand
- Choose supply chain
- Smart Monitoring Systems
- Sharing Platforms

4/6 HOSTELS

- Return recovered biological resources to the biosphere
- Prolong life through maintenance, design for durability, upgradability
- Choose food chain

3/6 HOSTELS

- Food waste loop

2/6 HOSTELS

- Remanufactured/Refurbished products or components
- Modular Construction and Design

Figure 30: Ranking of subcategories based on how many of the six analyzed hostels employ them

Exchange is extensively incorporated into the case studies' business models. It is not surprising that this dimension is thoroughly encompassed, as *interchange* captures the essence of this type of business and its target consumer, both recognizing the value of their connection to the community and its place to create and nurture the authenticity of the "hosteling experience". This inherent aspect of the hostel sector is optimally provided within a circular approach, in which systemic thinking and interconnection are essential for moving toward sustainable development. The examined hostels created a network of mutual engagement with the community, other local businesses, and

101

guests, who may also be agents of change and increase their environmental consciousness during their stay. For this process to be successful, it must start within the company by valuing and engaging staff members. Human capital is particularly crucial in the hostel industry because travelers highly value interaction. Thus, all case studies implement each subcategory of the *exchange* dimension. *The Yard* provides a perfect example of this CE class and how it may benefit a business in a variety of ways. With "The Front Yard" project, the hostel developed a thoughtful collaboration with local businesses to enhance the building's entryway with a range of neighborhood bars, restaurants, and stores. A space for everyone to be welcomed, to share, connect, and broaden the hostel's reach into the community.

Optimize is the second-ranked dimension. Indeed, it is potentially the one that best demonstrates how many simple, yet effective and beneficial measures can be implemented to improve daily operations and align them with CE without experiencing increased expenses. This dimension, particularly the "remove/limit waste" subcategory, was further classified into sets of actions that are used in similar ways by most of the assessed hostels. Examples include steps to limit water consumption and waste or to avoid the use of plastic. Moreover, optimization is also achievable through careful selection of additional products and service providers to boost the hostel's offer and wherever possible opting for local businesses that work sustainably and offer circular solutions. As a result, most case studies communicate the value they place on their supply chain. This attention can also be applied to the food chain, which is especially essential for hostel businesses that expand their dining options beyond breakfast and may reflect their commitment to local, ethical, and sustainable practices even in the food they serve to guests.

The *virtualize* dimension achieved third place in the classification. Its widespread adoption by hostels demonstrates that a HI organization can use digitalization to successfully communicate with its audience, make use of other circular and shared services via social platforms, and improve building efficiency through smart technology. Among the most interesting applications of this dimension is *Stayokay*'s use of a machine that assesses food scraps and the time of day when they are discarded to improve food offer. Otherwise, most of the virtualizing actions undertaken by the case studies are not particularly innovative, and the hosteling sector should develop this dimension further. Personalizing and updating a hostel digitally can be difficult, particularly for a small business, and requires technical and informatic skills. However, allowing guests access to certain smart services will significantly enrich the perceived value. The adoption of online travel agencies is one aspect of digitization that has not been examined in this study because it has become widely accessible to every HI business that wishes to extend its market potential and reach. The leader online travel agency in this sector is Hostelworld, which recently launched a digital innovation for the hostels' niche. The brand is currently focusing on "Helping travelers find people to hang out with" as stated in their mission line (Hostelworld Group, s.d.). Establishing new connections is the primary motivation for a traveler to stay in a hostel; thus, Hostelworld thought about enabling this to happen before the arrival at the destination and created a social network where customers shall start to meet online who will share the hostel experience with them. This idea also supports the home-away-from-home feeling and an opportunity to advertise events and social activities, from tours to a themed dinner (Hostelworld, 2023) ; (Hostelworld, s.d.). The Hostelworld initiative is an example of the innovation brought by the virtualized dimension to hostels.

Moving forward with the classification, the six hostels have evenly developed the *regenerate* and *share* dimensions, which are both ranked in fourth place. *Regenerate* aims to retain natural capital and help safeguard the ecosystem. More advanced approaches may still require considerable finances, not affordable for a low-cost service provider. If a chain like *Stayokay* can install solar panel energy in some of its hotels, smaller companies may have to wait for a specific, funded certification program to conduct similar structural interventions. The case studies showed how this dimension can still be incorporated in an accessible manner. For example, when greener power sources cannot be generated internally, renewable energy providers can be chosen. Furthermore, the *regenerate* dimension can be combined with the *optimize* dimension to increase the efficiency of daily operational tools and technologies, to reduce wasteful practices, and to maximize the value of natural capital. When it is not possible to eliminate a company's negative environmental impact, carbon compensation programs can be used to offset it. Some of the case studies use vegetation to enhance and safeguard their buildings' environment. These concepts implemented in the "Reclaim, retain, and restore health of ecosystems" subcategory could be expanded to take full advantage of the benefits of green optimization. For example, (Star Hostel Tapei Main Station, s.d.) and (Jo&Joe Paris Chantilly, s.d.) hostel created a rooftop garden where they cultivate organic ingredients to serve their restaurants while also increasing building isolation (Hostelworld, 2021). A similar project under the *regenerate* dimension can also be developed to incorporate the *loop* dimension. Star Hostel Taipei has a rainwater harvesting system to irrigate the greenery. Additionally, the hostel uses food scraps composting as fertilizer so that the cycle closes once the veggies have grown back and are served to guests (2021).

It has already been discussed in the previous chapter how strongly the *share* dimension resonates with the hostel industry. The concept itself entails experiencing a temporary home, sleeping in a dorm room and sharing communal areas, social activities and events with other travelers and the local community. If all these aspects were examined in this dimension, it certainly would be higher ranked, but the goal of the analysis was to identify alternative and innovative CE forms in which sharing could be developed. *Impact Beach House* better exemplifies how this dimension can be employed in a variety of ways. From the implementation of hostel spaces shared by guests and the community through coworking, as well as an area where secondhand items are exchanged and repaired with the help of the community, to the development of local CE-related businesses. Instead, some hostels might even take the sharing aspect of the hosteling experience for granted, because it is so ingrained in the business. Additional circularity could be implemented in this dimension. For example, the leasing business model could be improved to enhance the building's design and the services provided. Local collaborations with companies can make the hostel's social spaces, open not only to guests but also to the community, sharing areas where to showcase items such as plants and artwork that decorate the building, and books and travel guides to entertain and educate. The lease system can also be used to supply the hostel with sustainably cleaned linens for bedding, bicycles for guests to discover the surrounding areas in a healthy and sustainable way, and much more. This business model reduces the cost and impact of items' usage by substituting ownership with a product-as-a-service approach, while also fostering mutual support between the hostel and other local companies.

The *loop* dimension is the most underdeveloped of the six. Indeed, it includes the last three ranked subcategories, as shown in Figure 30. A possible explanation for this low implementation could be that, first

and foremost, loops are more often used in industrial production to retain the value of a product, avoid waste, and allow for its component reuse (Ellen MacArthur Foundation, s.d.). Furthermore, the looping system, as a core component of CE, can be an intrinsic feature of some measures that present other prevailing circular aspects and, hence, are classified under different dimensions. For example, as previously stated, actions related to reuse, remanufacture, and upcycling may be difficult to distinguish only from the assessed businesses' online communication, and some measures may have been incorrectly omitted from the "Remanufactured/Refurbished products or components". Furthermore, to successfully implement the "food waste loop" initiatives that effectively close the circle should be carried out through a circular food and beverage business model. Such a project requires expertise, organization, and the right execution of additional subcategories from other dimensions, such as green optimization and composting, as discussed in the *regenerate* section.

Finally, the least-implemented subcategory is "Modular Constructions and Design". *The Yard* and *Stayokay* provide examples of modular projects, utilizing building components then repurposed and adapted to various surroundings. A comparable technique might be used when developing a hostel based on a CE model from scratch. For instance, in Valle d'Aosta, the Italian Alpine region where this study has been conducted, a young architect named Matteo Deval developed an airlifted bivouac for glacier monitoring using blocks similar to Lego but made of wood (AostaSera, 2023). Analogous architectural advancements, created with disassembling and reuse in mind, could potentially be applied to the hosteling industry to adapt spaces as needed. The concept can also be used to customize interior design. Modular bed structures can help maximize room space by allowing the hostel to arrange the room typology given the incoming bookings: from a single to a bunk bed, or two separate beds that combine to make a

double bed. This adaptive optimization was implemented during the reconstruction of the building that now houses the (Nomad Hostel, 2021) in Treviso, Italy. Most of their furniture is modular, and each component of their dorm beds may be disassembled for cleaning or replacement (The Radical Project, 2022).

Although the circular economy is still at its outset and there are no frameworks for some specific sectors, such as the hosteling one, businesses in this niche are increasingly interested in offering services that align with the principles of sustainable development, which can be articulated using circular economy tools. The hostel industry's current trajectory lines up with the evolution of its target market, which consists of young travelers who are aware of the uncertain future they will face unless significant action is taken to mitigate the catastrophic effects of human-caused climate change.

The concept of hostels was created with social and sharing objectives in mind. Thus, these forms of businesses can be agents of this necessary transition in a more natural and straightforward manner compared to other industries. If aspects of circular economy and cooperation are inherent to this type of accommodation, additional steps can be taken to maximize its beneficial effects on society and the environment while minimizing its negative ones. A hostel, developed from its concept phase to its actual implementation in a business on a circular economy model, provides various opportunities to show how the circle can be made complete. In this context, modular architecture and circular design, together with resource monitoring systems, will enable the creation of low-impact buildings. Furthermore, spaces can be tailored to emphasize the sharing dimension of hosteling while allowing customers to choose their own balance of sociality and privacy. Circularity can also be viewed as a chance to broaden the hostel's business model to include complementary services that will enhance

the client experience. One example is the food cycle, where rainwater is collected and becomes a resource for the soil to produce genuine ingredients to serve to guests, which will return to the earth in the form of fertilizer.

All combined CE initiatives allow for the saving of material, energy, and human resources in addition to numerous environmental benefits. All this will result in cost savings, encouraging the company to continue promoting such a respectful way of conducting business. Circularity also improves the hostel's image, making it a community reference and an example of sustainable social practices. This valuable positioning in the sector can also be converted into a price rise for the enhanced value proposed, resulting in increased financial gain.

While circular economy remains a paradigm and an innovation in the hosteling business, its proper application requires the support of other realities that follow similar paths to form a network and collaborate in value creation. Developing early-stage circular chains entails institutional funding, sector certifications, and favorable legislation. As a result, the systemic nature of the transition process remains critical. If contributions to CE can begin with initiatives conducted by small businesses and niche sectors, only with cooperation at many different levels and sustained by institutions, can long-term sustainable development be achievable. That is, when we will finally reverse the course of the environmental and social crisis we are presently experiencing.

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114

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