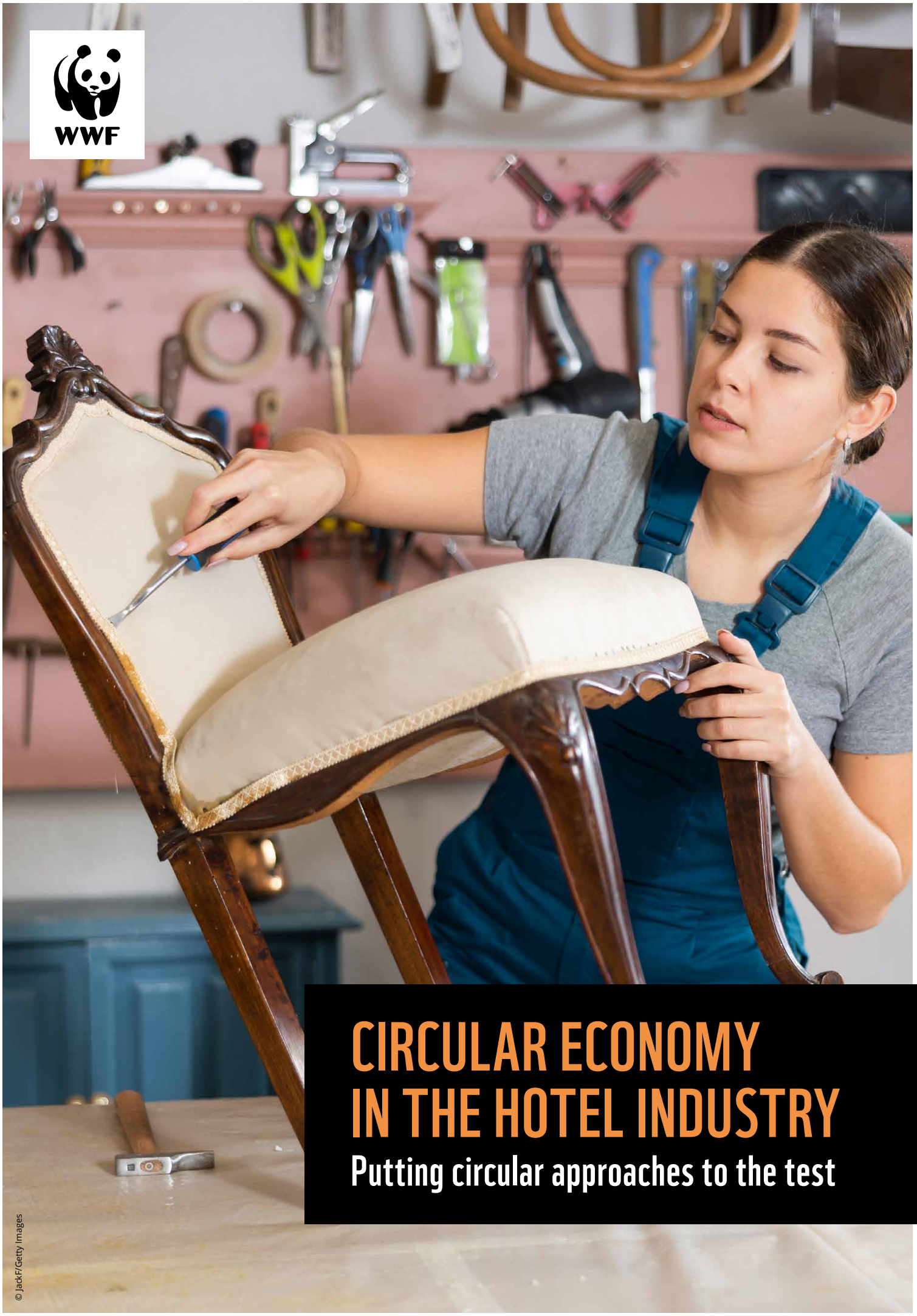

CIRCULAR ECONOMY IN THE HOTEL INDUSTRY

Putting circular approaches to the test

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In collaboration with:

KÜHNE LOGISTICS UNIVERSITY

LEONARDO Hotels

MOTEL ONE

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KALDEWEI supports WWF's work to prevent plastic waste.

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EXECUTIVE SUMMARY

In the hotel sector, the circular economy is often reduced to avoiding plastic and separating kitchen waste. The pilot projects presented in this report illustrate the many opportunities for putting circularity into practice in hotels. They show that circular strategies can be implemented during day-to-day operations, delivering both environmental and economic benefits.

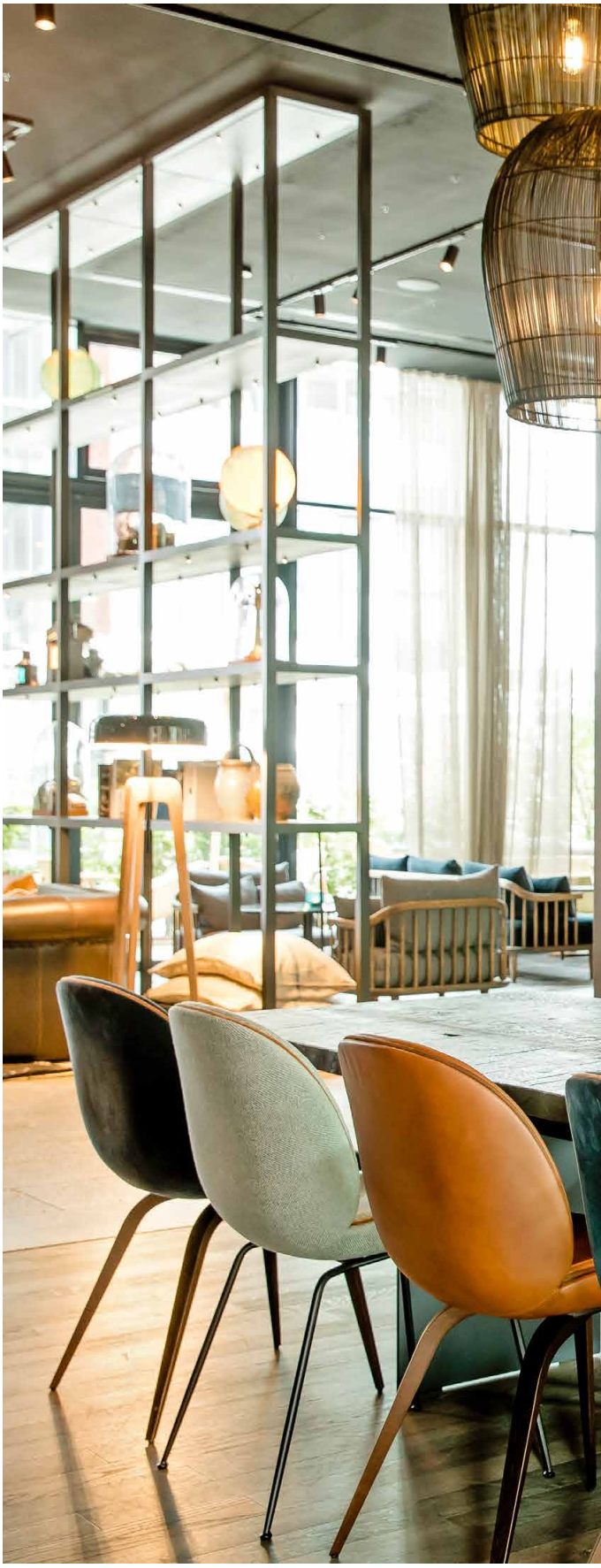
THE FOUR PILOT PROJECTS

- **Reuse (Motel One, Hamburg region)**
  The successful switch from single-use to reusable fruit salad packaging in the B2B sector[1] shows that a reuse system involving several companies is technically and organisationally feasible. The return rate is stable, and just 1.2% of containers are rejected.

- **Refurbishment (Leonardo Hotels, Berlin & Hanover)**
  Two hotel takeovers served as pilot projects for resource-efficient management of existing furniture. A systematic assessment of reuse potential took place instead of simply disposing of all the furniture. Almost 100% of the furniture remained in circulation in Berlin. In Hanover, the remanufacturing rate varied by furniture category and by the approach taken.

- **Recycle & Reduce (Motel One, Aachen)**
  Introducing waste separation in all 259 guest rooms reduced annual residual waste by 4.6–8.9 tonnes (18–34 kg per room) and disposal costs by around 31.5%, with minimal investment and no additional housekeeping costs.

- **Recycling (Leonardo Hotels, Ruhr region)**
  Separately collecting used PP food buckets[2] (for fruit salad, mayonnaise, mustard, etc.) and feeding them into a closed material loop achieved much higher recycling rates of up to 75–80%, with minimal additional effort. By way of comparison, conventional collection achieves a recycling rate of around 50%.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All four pilot projects showed that successful circularity in hotel operations largely depends on three factors.

1 Close integration into existing operational processes, keeping additional work for staff and guests to a minimum.

2 Effective coordination between the various actors along the value chain (hotel, supplier, logistics provider and recycler).

3 Early involvement and motivation of on-site staff, who ultimately determine whether implementation succeeds or fails.

Environmental benefits in the form of less residual waste, less virgin material and higher recycling rates are obtained if these conditions are met. Economic returns are also achieved, whilst additional costs remain low or else do not arise at all.

OUTLOOK: FROM PILOT TO SCALE

From the outset, all four pilot projects were designed to become part of normal operations if successful. The intention was for them also to be expanded to other locations, and this process is already well underway.

The reuse project has initially been extended until the end of 2026. Leonardo Hotels now systematically assesses the remanufacturing potential of every new takeover. Waste separation at Motel One in Aachen will continue indefinitely, and further hotels are set to join the recycling project as material suppliers.

WWF therefore explicitly sees this report as a starting point, rather than as a final record. The aim is for the findings, process solutions and lessons documented here to be presented and communicated in a way that enables as many hotels as possible beyond the pilot locations – regardless of size, chain affiliation or star rating – to adopt them and to develop their own circular economy projects.

This report is intended to provide practical inspiration for the entire hotel industry.

1 INTRODUCTION

A circular hotel sounds good. But what does that mean in practice for hotel operations? What opportunities exist for implementation, and what are the barriers? WWF and Kühne Logistics University (KLU) launched several pilot projects in conjunction with Motel One and Leonardo Hotels in order to explore these questions. The focus is on four specific circular strategies: (1) reusable food packaging systems, (2) remanufacturing[3] and second-life solutions for hotel furniture, (3) reducing residual waste through better waste separation and (4) closed-loop recycling for plastic containers.

The pilot projects aimed to establish whether greater circularity is feasible in practice and can be integrated into hotels. They also looked at which challenges arise and at how these can be overcome and examined the specific resultant environmental benefits. The intention was for successful approaches emerging from all the pilot projects to become permanent and be integrated into normal operations. WWF's objective is for as many hotels as possible to learn from these findings, incorporate them into their strategies and launch their own projects.

PROJECT PARTNERS

Kühne Logistics University (KLU)

- Private, state-recognised university based in Hamburg
- Several hundred students and researchers
- Among the leading universities in its field
- Focus: logistics, supply chain management and management
- Internationally oriented research and teaching
- Works closely with businesses on practical questionsn

Leonardo Hotels

- International hotel group with a broad portfolio of midscale and upscale hotels
- Part of the Fattal Hotel Group, one of Europe's largest hotel companies
- Operates more than 300 hotels in Europe and other regions
- Serves business and leisure travellers

Motel One

- German hotel group in the budget design segment, based in Munich
- Operates over 100 hotels in 13 European countries
- Among the leading hotel chains in Europe's budget design market
- Combines standardised quality and design concepts with central locations

World Wide Fund for Nature (WWF)

- One of the world's largest independent conservation organisations
- Works to conserve biodiversity and protect the climate and natural resources
- Active in over 100 countries
- Works with governments, businesses and civil society to promote sustainable solutions

2 WHY A CIRCULAR ECONOMY MUST CONSERVE RESOURCES

Global resource consumption has risen over the past five decades from **30 billion tonnes in 1970 to 106 billion tonnes in 2020**.[4] This worldwide appetite for raw materials is pushing the planet to its limits. Earth Overshoot Day marks the date when humanity has used all the natural resources and services that the Earth can regenerate in a whole year. In 2026, this fell on 30 July.[5] In other words, we would need 1.8 Earths to continue living as we do today. Germany's Overshoot Day fell even earlier, on 10 May 2026.[6]

Wealthy countries consume far more resources than countries with a lower gross domestic product (GDP). Germany ranks among the highest internationally. At around 15 tonnes per person per year, German raw material consumption exceeds the European average and is roughly twice that of developing and emerging economies.[7] At the same time, we are failing to return materials to circulation. Circle Economy calculates the global circularity rate at just 6.9%. This means that around 93 % of materials come from primary sources.[8] The circular material use rate (CMUR), as measured by Eurostat for Europe, is around 13 % in Germany[9] and averages 12.2 % across Europe.[10]

The consequences are far-reaching. Climate change, biodiversity loss, land degradation and water scarcity worldwide are all exacerbated by the extraction and processing of raw materials and by the use and disposal of the goods made from them. In Germany, around 40 % of greenhouse gas emissions are directly attributable to raw material extraction and processing. Globally, the figure exceeds 50 %.[11] High raw material consumption also increases dependence on other countries and is associated with serious social and human rights problems along the extraction chain.

THE LINEAR MODEL MUST BE REPLACED

By 2045, a systematic circular economy approach could save Germany around 179 million tonnes of raw materials, avoid 186 million tonnes of CO_2 equivalents and prevent up to € 157 billion in global environmental costs.[12]

WHAT DOES A CIRCULAR ECONOMY MEAN IN PRACTICE?

A holistic circular economy encompasses five aspects.[13]

- **Narrow resource flows:** for example by using materials more efficiently and integrating digital solutions.
- **Substitute materials:** for example by using renewable raw materials and technical innovations where environmentally and socially appropriate.
- **Slow resource flows:** for example through durable design that enables longer product use, reuse and repair.
- **Intensify product use:** for example through services that make it easier to share or jointly use products.
- **Close resource loops:** for example through high-quality recycling, new reverse logistics infrastructure and design focused on the use phase.

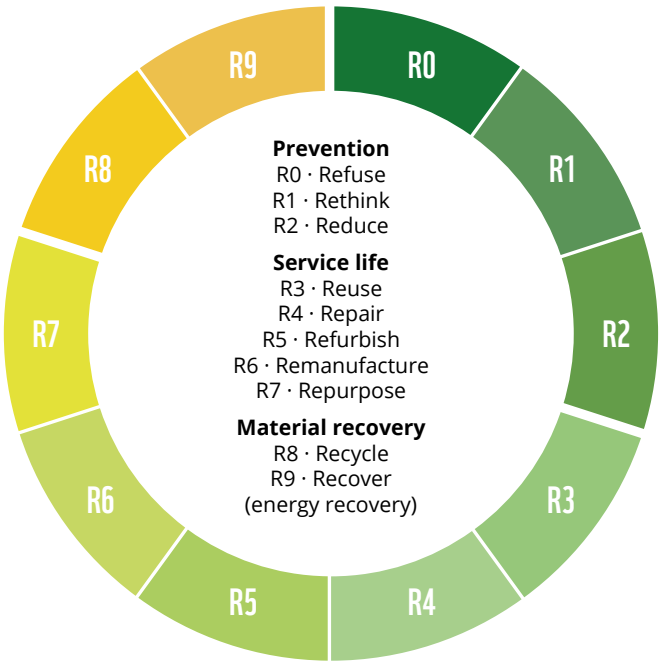

Fig. 1: Translating the circular economy into practical action through the ten R-strategies.

3 THE CIRCULAR ECONOMY IN THE HOTEL SECTOR

The hotel sector has considerable potential to conserve resources through circular solutions.

A basic distinction should be drawn between hotel operations, including furnishings and equipment, and the building itself. Both offer potential for resource savings through circular economy measures.

Circular measures in operations and interiors can be implemented in the short term. In the long term, enormous potential lies in buildings. Decisions on planning, construction and material selection largely determine whether resources are conserved and whether materials can later be reused. A comprehensive assessment should consider both the property and consumer goods and consumables.[14]

Figure 2 shows material flows in hospitality. The three phases – Inflow → Use → Outflow – illustrate where resources are lost and where circular economy opportunities lie.

3.1 WHAT HOTELS IN GERMANY ARE ALREADY DOING WELL

Avoiding plastic (waste) and reducing residual waste
Ideally, materials should be viewed as resources or recoverable materials. Yet this understanding is not yet embedded throughout Germany's hotel industry. A steadily growing number of hotels avoid and reduce single-use plastics, separate operational waste into different categories. This allows them to reduce residual waste, most of which is subsequently incinerated. Hoteliers receive support and training in operations and waste management through sustainability certification programmes, or are motivated by their own commitment to environmental responsibility.

According to estimates by the German National Tourist Board, around 18% of hotels in Germany now hold sustainability certification, and this figure is rising[15] – a welcome development. These hotels have thus been systematically addressing waste and plastic prevention for many years.

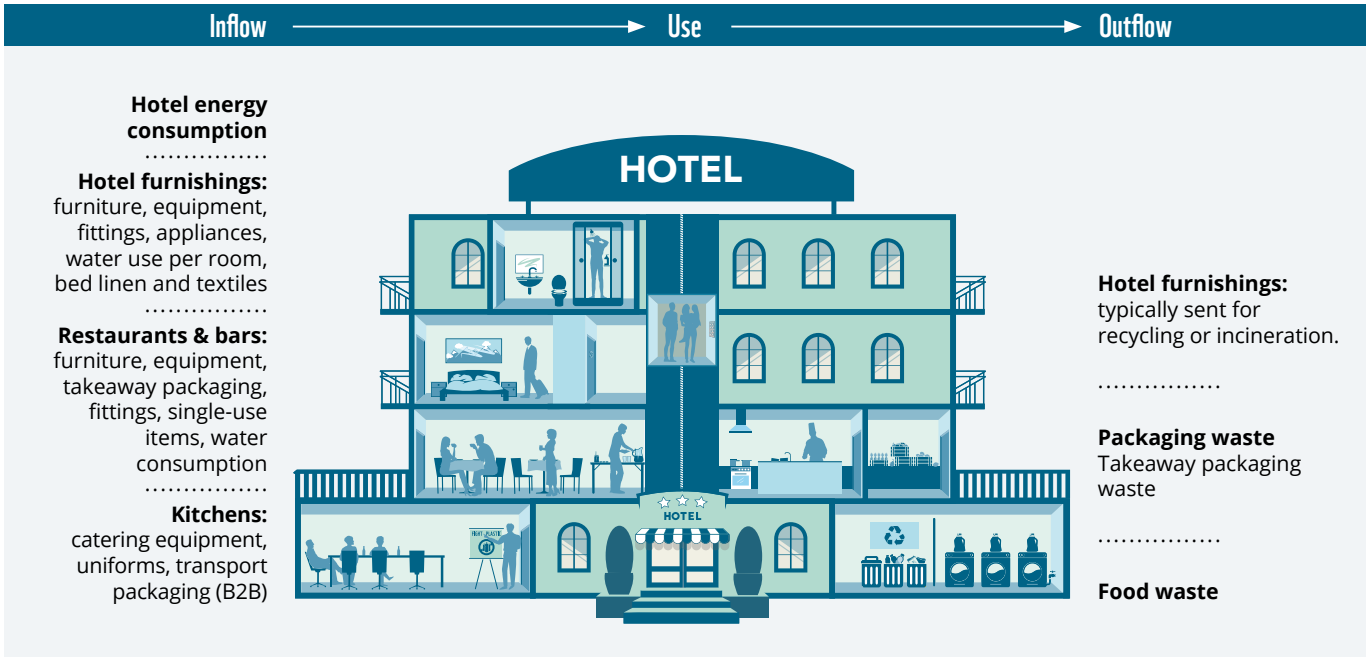

Fig. 2: Value losses in hospitality and opportunities to increase value through the circular economy. The diagram shows that the sector loses materials and value through short use cycles, high water and energy consumption and avoidable waste. A consistent circular strategy could both cut costs and substantially reduce environmental impacts. The life cycle of furniture, fittings and appliances typically ends in recycling or incineration despite significant potential to extend service life, reduce inflows and close loops.

A holistic understanding of the circular economy that consistently prevents waste and keeps materials in circulation for as long as possible remains the exception in practice.



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3.2 WHERE IS FURTHER ACTION NEEDED?

Circularity is not yet fully integrated
Although more hotels are avoiding single-use plastics and reducing operational waste, most still lack a holistic strategic approach to the circular economy. Further measures – such as early construction decisions favouring circularity (material selection, modular and resource-efficient building), investment in reuse systems or using repair, refurbishment and recycling as vehicles for the systematic assessment and improvement of the circularity of hotel products, equipment and processes – are considerably more demanding to implement and therefore still rare.

In the hotel industry, new purchases still dominate over repair, refurbishment and high-quality recycling.
In Germany, hotel rooms and interiors are fully renewed every 7 to 15 years on average.[16] This generates large amounts of waste and enormous material and resource consumption. New trends, guest expectations, design changes and short lifespans caused by poor-quality furnishings or pressure to modernise all lead to the replacement rather than to the refurbishment of furniture and inventory. As in the building sector, buying new is cheaper than repairing or high-quality recycling.

Frequent changes of ownership and takeovers of companies and chains are exacerbating factors too. When a

hotel is sold or rebranded, interiors are often replaced in their entirety regardless of condition. Printers, mattresses and furniture, for example, are also replaced because of existing framework agreements with service providers.

There is considerable potential here for greater resource efficiency and circularity in hotels. Circular transformation is demanding, but unavoidable.

Hotels that adopt circularity early should benefit economically and environmentally in the long term. In principle, an obligation on manufacturers to repair products could help drive the circular economy.

BENEFITS OF A CIRCULAR BUSINESS

According to the German Economic Institute (IW),[17] companies pursuing at least one circular strategy are, on average, more successful than those without circular economy approaches.[18] Circularity creates financial opportunities, including new revenue streams, improved material flows and secondary materials that substantially reduce purchasing costs. Businesses thus contribute to sustainability goals and become more resilient to regulatory changes. They benefit from greater resource efficiency, better market opportunities, more innovation and investment, improved risk management, stronger brand reputation and customer loyalty. Opportunities to attract and retain staff are also enhanced.

It is also clear that developing and testing a circular business model requires a willingness to innovate, risk awareness and perseverance.

The long-term goal must be a systemic transformation towards a circular hotel sector that consistently reduces virgin raw material use, keeps materials in circulation and thus protects nature and the climate.

3.3 WHAT REGULATORY CHANGES ARE COMING?

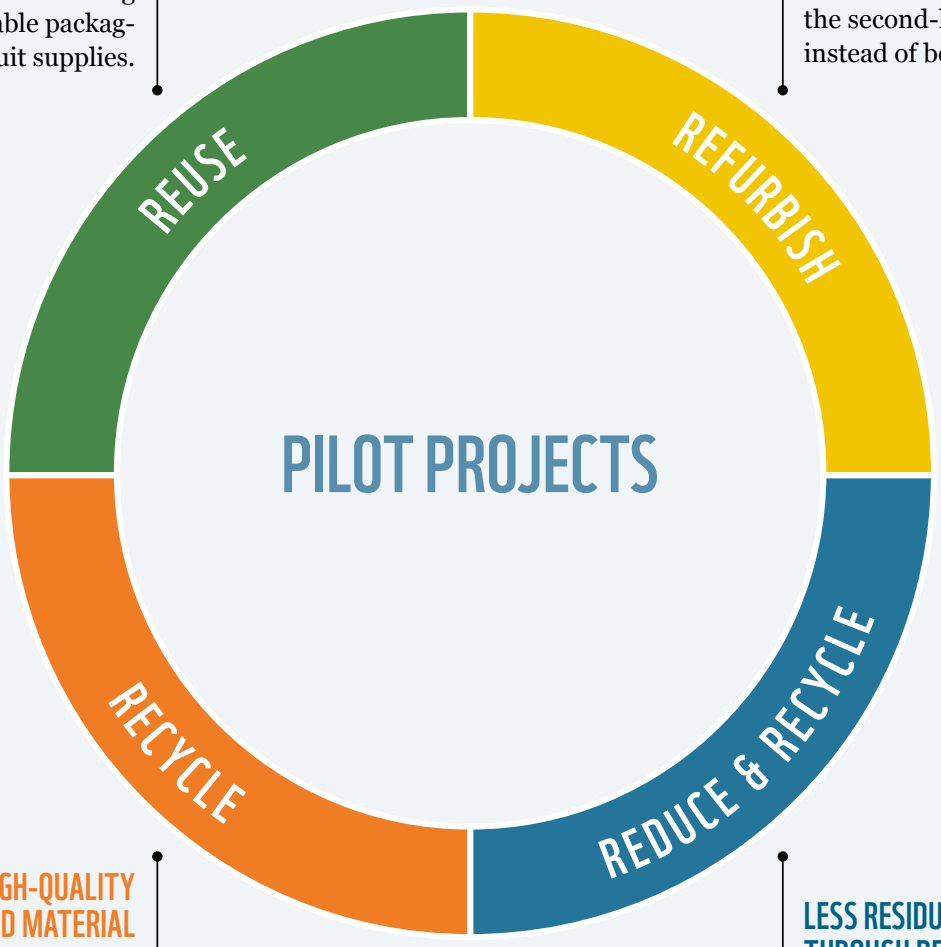
New requirements for the hotel sector: the Packaging Regulation is coming

Binding requirements will take effect over the coming years in the wake of the EU Packaging and Packaging Waste Regulation (PPWR), which enters into force on 12 August 2026. This will require a shift towards greater circularity:[19]

- From January 2030, small single-use plastic packaging for cosmetics, hygiene and toiletry products will be banned in accommodation establishments, explicitly including hotels (Annex V, PPWR).
- From January 2030, single-use plastic packaging for food and beverages filled and consumed on hospitality premises (bowls, disposable plates, etc.) will be banned (Annex V, PPWR).
- From 1 January 2030, single-use plastic packaging for individual portions of condiments, preserves, sauces, coffee creamer, sugar and seasoning may generally no longer be placed on the hospitality market (e.g. sachets and tubs).[20]
- From 12 February 2027, restaurants and cafés – including hotel restaurants, room service and breakfast areas – must allow guests to use their own containers for takeaway food and drinks at no extra charge (Article 32, PPWR). German packaging law already requires this.
- The EU obligation to offer reuse options will apply from 12 February 2028. Consumers buying takeaway drinks or prepared food must be able to obtain them in reusable packaging within a reuse system. German packaging law already requires this.
- Recycling and recycled-content targets are increasing across the EU. From 2030, contact-sensitive plastic packaging must also contain at least 10% post-consumer recycled material. As mandatory recycled-content targets rise, clean, separately collected material streams such as those from hotels will become more valuable.

4 FROM THEORY TO PRACTICE: FOUR PILOT PROJECTS

The pilot projects examined below show the considerable potential for greater circularity in hotels and demonstrate that implementation delivers environmental benefits and economic value.



LESS SINGLE-USE PACKAGING – THE FRUIT SALAD BUCKET EXAMPLE

Motel One
Five hotels in Hamburg switch to reusable packaging for their fruit supplies.

A SECOND LIFE FOR HOTEL FURNITURE

Leonardo Hotels
Hotel furnishings are refurbished and sold on the second-hand market instead of being destroyed.

USING HIGH-QUALITY RECYCLED MATERIAL

Leonardo Hotels
A hotel in Dortmund makes its fruit salad buckets available for closed-loop recycling.

LESS RESIDUAL WASTE THROUGH BETTER SEPARATION

Motel One
One hotel introduces waste separation in guest rooms.

Fig. 3: Circular economy in the hotel sector – four pilot projects

PILOT PROJECT 1

REUSE

Reducing single-use packaging: the fruit salad bucket example

MOTEL ONE

Hamburg region
Time frame:
1 March–31 May 2026

DESCRIPTION AND OBJECTIVE

This project aimed to reduce the use of single-use packaging in Motel One's supply chain.

It examined whether single-use containers in food supply chains could be replaced by PFABO's reusable B2B packaging system.

Fresh Factory's 'Hamburger Jung' fruit salad (5 kg) was packaged in single-use polypropylene (PP) plastic buckets before the project began. Fresh Factory supplies Motel One hotels with fruit salad several times a week, primarily through the wholesaler and logistics provider Transgourmet. To trial the switch from single-use plastic containers to a reuse system, PFABO reusable containers had to be tested in deliveries to Motel One hotels under real operating conditions and integrated into all participating companies' logistics processes. Fruit salad buckets were chosen because they are a standardised product with frequent deliveries and a manageable supply chain.

PARTNERS INVOLVED

- **PFABO** develops modular reusable packaging solutions for the food industry's B2B sector. In addition to packaging, it provides a supporting 'Packaging as a Service' concept covering cleaning, reverse logistics and digital traceability.
- **Fresh Factory** specialises in cutting and preparing fresh fruit and fruit salads for wholesale, retail, foodservice, catering and hotel customers, including Motel One hotels in Hamburg.
- **Transgourmet Germany** is a wholesaler primarily supplying restaurants, hotels and institutional catering. It specialises in food, non-food products and services.
- **cup&more Mehrweglogistik** participates in the pilot reuse loop as a professional cleaning provider. It handles digital registration, cleaning, disinfection and quality inspection of returned reusable containers.

STRUCTURE AND APPROACH

The pilot project was conducted in five Motel One hotels in Hamburg: Hamburg am Michel, Hamburg-Airport, Hamburg-Alster, Hamburg-Altona and Hamburg-Fleetinsel. It ran for approximately 13 weeks and covered the entire packaging loop (see Figure 4). The focus was not simply on replacing a packaging material, but also on identifying the practical requirements, operational adjustments and coordination between companies needed to transform a previously linear packaging process into a functioning circular supply chain within existing processes.

All project partners coordinated regularly throughout the project.

METHODOLOGY

Quantitative and qualitative analyses were conducted during the project. The quantitative analysis covered both historical data on single-use packaging consumption at the participating Motel One hotels and newly collected data on reusable packaging. This enabled comparison of packaging volumes, plastic consumption and potential savings and an assessment of the effects of switching to reusable packaging.

A complementary qualitative study was carried out with support from Kühne Logistics University students. It examined the PFABO reuse system from the perspective of the participants in the Hamburg pilot supply chain. The analysis is based on semi-structured interviews with representatives of PFABO, Fresh Factory, Transgourmet and Motel One. Additional visits to Transgourmet and Motel One helped to understand operational processes, practical conditions and potential implementation barriers more fully.

THE REUSE LOOP IN DETAIL

PFABO reusable buckets are designed to resemble conventional single-use packaging as closely as possible, without compromising food safety, handling or convenience. Care was also taken to ensure smooth integration into the existing processes and logistics of all participants in the reuse loop. Optimal integration into existing operations was a central element of the pilot project.

The reuse loop begins with PFABO, the system provider and owner of the reusable containers. PFABO supplies clean, inspected, ready-to-use containers with lids and ensures sufficient quantities are available for filling at Fresh Factory. Digital connectivity is therefore integral to the reuse system, enabling transparent management and tracking of every individual package in the loop.

At Fresh Factory, containers are filled, sealed, labelled and prepared for dispatch within two hours. As the fresh product has a limited shelf life, timings are tight. After filling, containers must quickly enter forward logistics so that longer storage or handover times do not reduce the remaining shelf life. Handover to Transgourmet generally takes place within 24 hours.

Transgourmet handles forward logistics, integrating filled fruit salad containers into its existing distribution processes. Motel One locations receive daily deliveries within fixed time windows as part of Transgourmet's normal process. Hotels can therefore receive filled fruit salad containers several times a week, according to demand. Distribution must also minimise transport times, interim storage at the Transgourmet hub and delivery times to hotels, since fruit salad has a limited shelf life after filling.

Motel One hotels receive the filled containers, check their integrity and store them until needed for breakfast service. Once the fruit salad is removed, the product flow ends but the packaging loop continues. Hotel staff

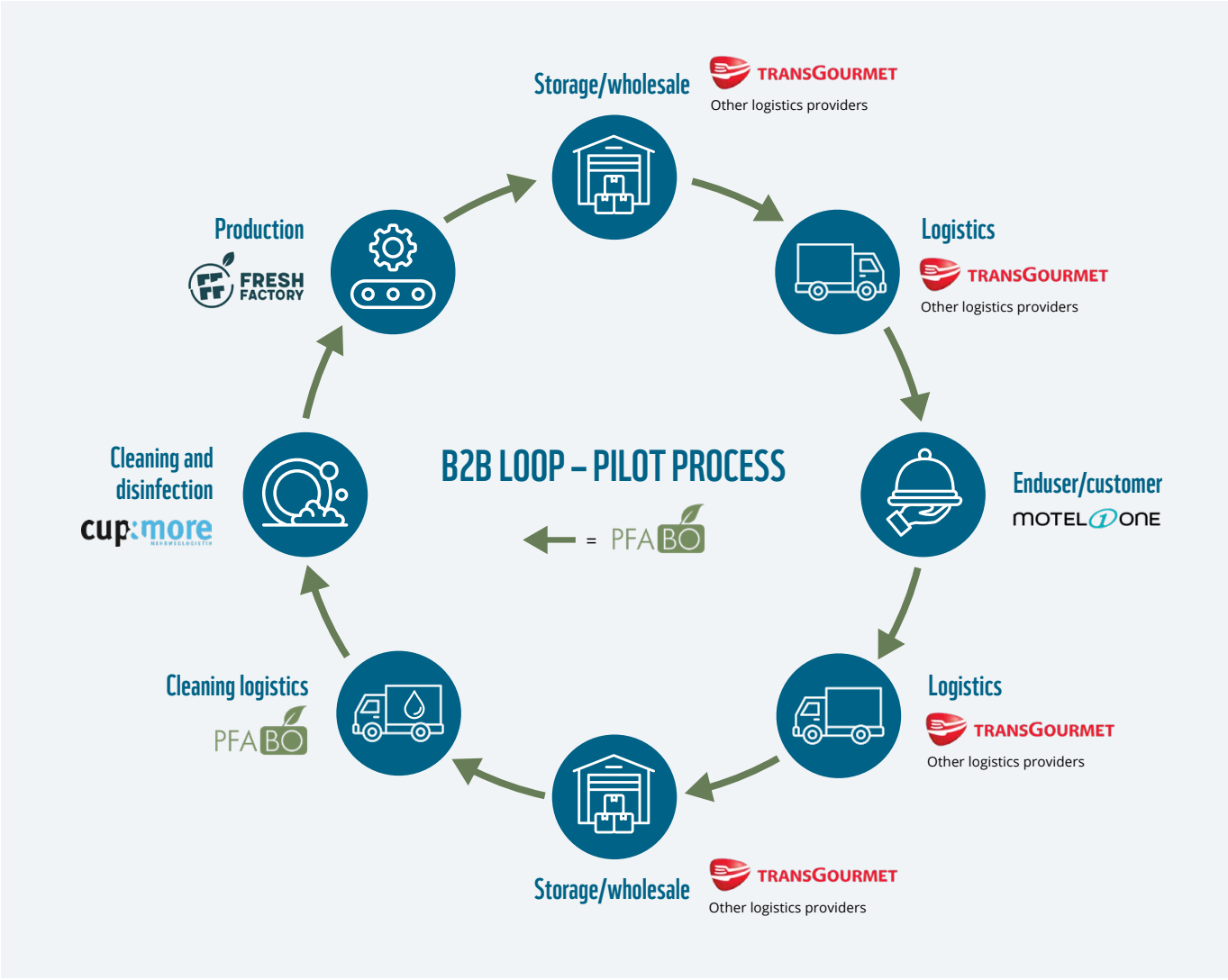


Fig. 4: B2B loop, pilot process (source: own illustration based on a project by KLU students on the Bachelor of Science in Business Administration programme[21])

© PFABO



Transgourmet handles the logistics of the filled containers

collect the empty containers, pre-clean or rinse them, stack them and prepare them for return. Depending on delivery and collection schedules, empty containers may be stored temporarily at the hotel until collected during a subsequent Transgourmet delivery.

Transgourmet also handles the first stage of reverse logistics, returning containers from hotels to the Transgourmet hub.

Drivers currently collect empty PFABO containers and lids in outer packaging from the hotels, record returns through QR-code scans and counts and transport the containers back to the Transgourmet hub, where they can be consolidated and temporarily stored. This return process significantly expands Transgourmet's role. It is responsible not only for hotel deliveries, but also becomes a key actor in collecting, returning and consolidating used reusable containers.

The second reverse logistics stage – transport from the Transgourmet hub to the washing provider – uses a logistics company's flexible transport service. Such services generally have no guaranteed time windows, allowing providers to improve fleet utilisation, reduce empty trips and lower CO_2 emissions per delivery. Delivery times are usually based on estimated standard transit times, in this case two to five days.

Finally, used containers arrive at cup&more Mehrweglogistik for professional cleaning, disinfection and quality inspection. Checks establish whether containers remain fit for use or must be removed from circulation due to damage. After successful cleaning and inspection, containers are ready for reuse and can be supplied to Fresh Factory for refilling with fruit salad.

This creates a closed reuse loop in which packaging circulates repeatedly between PFABO, Fresh Factory, Transgourmet, Motel One, another logistics provider and cup&more, while only the fruit salad product is consumed. Packaging is no longer treated as a consumable purchased once and then discarded, but as a reusable service component within a Packaging-as-a-Service model. PFABO systematically organises the supply, return, cleaning, quality inspection and renewed availability of reusable containers.

QUANTITATIVE RESULTS

Single-use containers

Consumption data shows that, without reusable packaging, the five Hamburg hotels would have used 2,261 single-use fruit salad buckets during the trial. At approximately 187 grams of plastic each,[22] this represents around 423 kilograms of single-use plastic.



© PFABO

Extrapolating annual consumption, assuming unchanged demand at these five Motel One hotels, this would amount to 9,044 single-use plastic packages (bucket + lid) and 1,691 kilograms – over 1.5 tonnes – of PP plastic.

Extrapolating annual consumption across all German Motel One hotels, based on 2025 data, would amount to approximately 69,000 single-use plastic packages (bucket + lid) and around 12.9 tonnes of PP plastic potentially saved.

Reusable containers

At 374 grams, the reusable bucket used in the pilot is heavier than the previous single-use version, but is designed for up to 500 use cycles. Its temperature resistance of -20°C to +95°C allows industrial-scale washing.

During the three-month pilot, the five participating Motel One hotels returned 1,250 reusable buckets, approximately 55% of the filled containers. At that point, the stock was distributed across several stages of the loop, including a safety stock at Fresh Factory and returned buckets at Transgourmet.

At this point, 63 of the 1,250 reusable buckets returned had defects. It proved possible to rework or retain 48 of these for later return to the reuse loop. 15 had to be permanently withdrawn due to excessive damage. This represents a final rejection rate of around 1.2% of all returned reusable buckets. Defect analysis showed that these buckets had been handled improperly during use or return.[23] 1,235 returned buckets were thus available for refilling following cleaning and quality inspection. A comparable or better return rate is expected for subsequent returns as the project continues.

The figures show that the reuse loop worked in principle during the pilot. Return processes, proper handling and quality control are nevertheless crucial to the system's stability and scalability. Following the successful pilot, the partners agreed to continue the project and extend it to further locations.

QUALITATIVE RESULTS

Alongside the quantitative assessment, qualitative interviews with key actors in the reuse loop evaluated the practical feasibility of the PFABO system from different companies' perspectives. The focus was on opportunities, operational challenges and coordination needs. The findings below show that introducing a reuse system is not merely a question of packaging technology; it depends substantially on integration into existing processes, clear responsibilities and effective cooperation between the participating companies.



© PFABO

PFABO reusable buckets in use, filled with fruit salad

MOTEL ONE

OPPORTUNITIES

- Single-use packaging can be avoided with little additional operational workload, once processes have been designed – a stage that does require extra work.
- Existing processes can largely be retained. Containers are cleaned, collected and prepared for pickup after use.
- The pilot generates practical knowledge for possible expansion to other product categories.

CHALLENGES

- Staff behaviour and integration into routines
- Dependence on upstream partners
- No prior experience of a deposit-based reuse system: → new routines first need to be established.
- Containers may be repurposed by staff, service providers or third parties; around 5% have so far been used for other purposes.

TRANSGOURMET

OPPORTUNITIES

- An opportunity to become a significant reverse logistics actor alongside the forward logistics role. Reverse logistics is not yet widespread in wholesale, but will become necessary in view of PPWR requirements.[24]
- Developing reuse loops for food deliveries supports Transgourmet's sustainability strategy and can make an important contribution to reducing packaging waste.

CHALLENGES

- As well as delivering goods, drivers must accept, count, document and transport emtpy containers and assess hygiene.
- Details of return processes must be communicated, coordinated and incorporated by customers.
- Additional waiting times and pressure on route duration and vehicle capacity may arise.
- Involvement in deposit clearing can create financial risks from lost deposits.

FRESH FACTORY

OPPORTUNITIES

- Early integration of reusable containers into production positions the company as an innovative, sustainability-oriented producer.
- Strategically, it offers an opportunity to anticipate regulatory developments, build process expertise and be a first mover in sustainable B2B food packaging for customers.

CHALLENGES

- Additional production and quality assurance measures may be necessary.
- Containers differ from previous single-use versions in terms of shape, rim design, lid pressure and closure mechanism. This requires adjustments to machinery and automated processes.
- Low volumes during the pilot required manual filling, increasing costs.
- The lower visual transparency of grey reusable containers was seen as a disadvantage for product presentation.
- Customers may have reservations about reused packaging.

PFABO

OPPORTUNITIES

- PFABO is positioned as a system provider with an integrated reuse model, combining reusable containers, deposit logistics, professional cleaning, quality control and digital traceability in one system.
- The system provides the technical and organisational basis for a scalable B2B reuse loop and thus for long-term reductions in single-use packaging and waste.

CHALLENGES

- The main challenge lies less in providing the reusable containers themselves than in integrating the system into the operations of every partner in the loop.
- Digital traceability must be ensured throughout all partners' processes. Documentation must work at every handover point and return flows must be reliable.
- An efficient circular economy requires critical mass to achieve environmental impact and economies of scale.



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PILOT PROJECT 2

REFURBISHMENT

A second life for hotel furniture

LEONARDO *Hotels*

Berlin & Hanover
Time frame:
1 June 2025–31 March 2026

DESCRIPTION AND OBJECTIVE

Leonardo Hotels' project aimed to give discarded furniture a second life – after refurbishment where necessary – rather than disposing of it indiscriminately during refits and hotel takeovers.

Leonardo Hotels is addressing an important issue in the hotel industry. During renovations, rebranding or refits, hotels are often completely cleared without systematically distinguishing between furniture that remains usable, can be refurbished or is no longer recoverable. Operationally, this is understandable. Hotel renovations are highly time-sensitive. Closed rooms generate no revenue, and construction or conversion schedules are tight. Standard processes therefore often prioritise clearing rooms as quickly as possible.

Conventional clearance or renovation processes do not generally provide for the assessment of individual items. Neither do they envisage dismantling, cleaning, interim storage, quality inspection, refurbishment, pricing and resale. This would require a dedicated reverse supply chain organising both removal and treatment that preserves the furniture's value.

This is where Leonardo Hotels' project comes in. Working closely with specialised external providers, the aim is to view discarded furniture as a potential resource rather than bulky waste. Depending on condition and demand, furniture is collected, cleaned, refurbished, resold, donated, reused in the hotel or – if further use is impossible – disposed of. This shifts the process from linear disposal to a circular approach that systematically captures the residual value of hotel furniture (see Fig. 5).

PARTNERS INVOLVED

- **Twins Company** (Berlin) initially specialised in residential clearances before expanding into commercial hotel clearances in 2007. It takes all recoverable items—beds, mattresses, lamps and curtains—and transports them to warehouses for subsequent resale.
- **Eurotel Hospitality Solution/GH HOTEL INTERIOR GROUP GMBH** for the Berlin

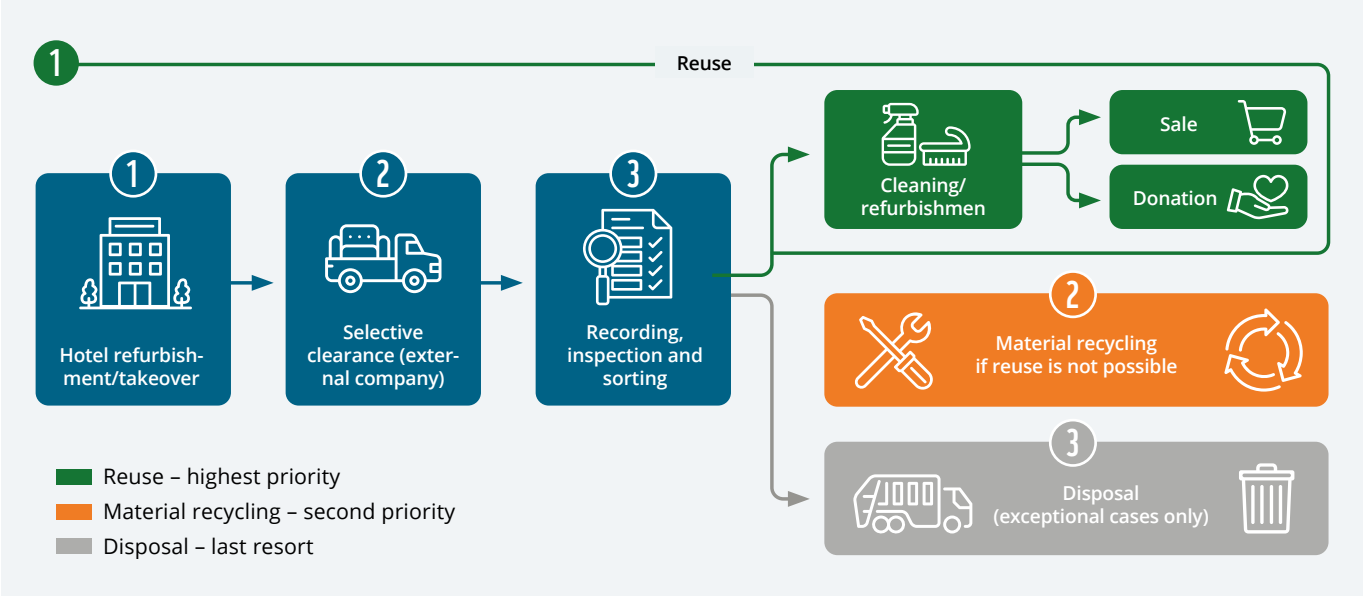

Fig. 5: Reverse supply chain for hotel refurbishments

pilot: the two companies have a strategic partnership and have served as Leonardo Hotels' general contractors for many years. Their support for hotel projects encompasses initial advice, interior design, furniture manufacture in their own fully integrated production facilities and turnkey handover.

- **kagota GmbH** (Hanover) provides decluttering, household clearance and commercial clearance services with a commitment to efficiency and environmental responsibility.
- **Metal recycler A. Wulfekopf** recycled the slatted bed bases removed during the Hanover clearance.
- **Concular** helps property owners, asset managers and manufacturers develop and implement circular construction strategies, from existing-stock analysis to practical implementation.
- **Leonardo Development, hotel managers and staff** (Berlin & Hanover) coordinated the various trades, providers and schedules whilst ensuring smooth continuation of hotel operations.

STRUCTURE AND APPROACH

The project examined two pilot cases.

1 The Posthouse Berlin Potsdamer Platz, formerly Hotel Berlin Potsdamer Platz/Crowne Plaza: June – August 2025

2 Leonardo Hotel Hannover Medical Park in January 2026

Both hotels had recently been taken over by the Leonardo hotel chain. This provided an opportunity to assess existing furniture against the new brand positioning and identify which items could be reused, refurbished or otherwise recovered.

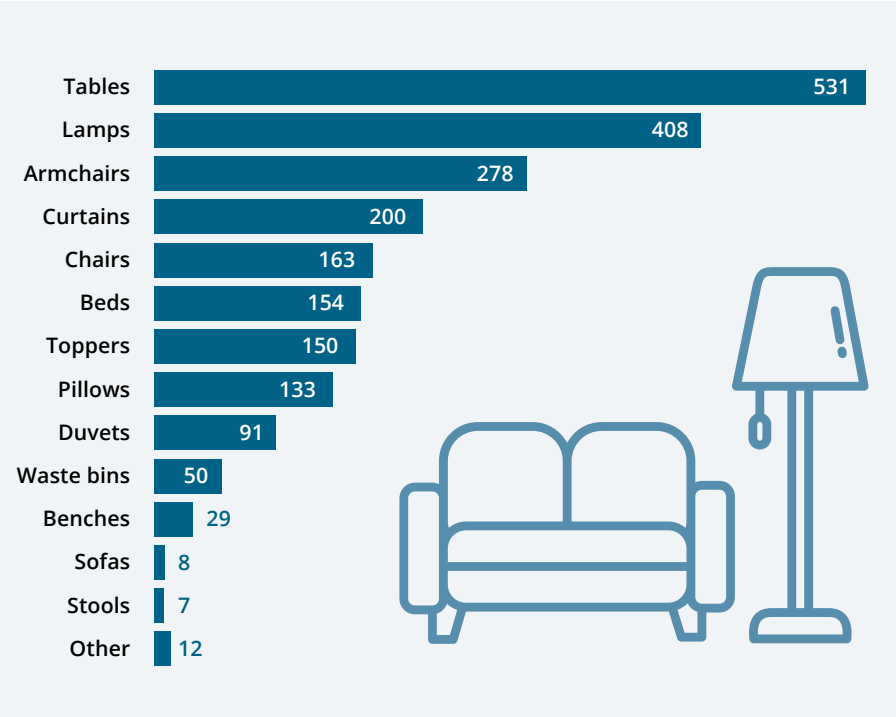

Fig. 6: Furniture from The Posthouse Berlin, formerly Crowne Plaza, that could be reused after clearance by Twins Company (number of items).

Pilot 1: The Posthouse Berlin Potsdamer Platz

METHODOLOGY AND QUANTITATIVE RESULTS

The first pilot took place at The Posthouse Berlin, Potsdamer Platz, formerly Hotel Berlin Potsdamer Platz/Crowne Plaza, between October 2025 and May 2026. Twins Company e.K.[25] handled the clearance. Eurotel Hospitality Solutions carried out the renovation, with Leonardo Development coordinating both. Twins Company is run by Astrid Eilers and specialises in clearing and recovering furniture from hotels and commercial premises. Unlike conventional clearance, which prioritises rapid disposal of inventory, Twins Company identifies furniture that remains usable and gives it a further use phase. It has expertise in used hotel furniture and access to suitable resale channels. In the pilot, Twins Company therefore provided an important link between hotel clearance, remanufacturing and remarketing.

A total of 2,214 items were recorded during clearance (see Fig. 6). The largest categories were tables, lamps, armchairs, curtains, chairs and beds. These six categories accounted for a substantial share of the entire inventory cleared.

One of the most significant findings of Twins Company was that almost 100 % of the furniture could be reused, mostly through resale to two-star or three-star hotels. Eurotel refurbished the luggage racks[26] so they could remain in the hotel. Existing metal frames, around 60 % of the material, were retained. Wooden slats, which made up around 40 % of the racks, were replaced with new

upholstered elements. Refurbishment and external resale are therefore not the only options. In-house refurbishment and continued use within the hotel are also relevant circular pathways.

The Berlin pilot showed that, under suitable organisational conditions, a very high proportion of hotel furniture can be reused. The key is to organise clearance as a structured recovery process rather than as simple disposal. The high reuse rate suggests that much of the furniture remained technically and functionally fit for use. Without specialist partners, conventional hotel clearance would probably have captured little or none of this potential.

The destination of furniture was tracked using a QR-code-based digital recording system. The aim was a systematic recording of material flows and the proportion of furniture reused. However, very few customers responded through the system. This meant that the actual destination could not be traced for every item. From a circular economy perspective, QR-code tracking offers a practical way to monitor material flows and reuse transparently. Its application also shows that reliable data can only be obtained when recording is integrated into operations and consistently implemented.

Pilot 2: Leonardo Hotel Hannover Medical Park

METHODOLOGY AND QUANTITATIVE RESULTS

kagota GmbH cleared Hannover Medical Park. As part of the pilot, it also provided an initial assessment of which furniture could be passed on, stored temporarily or disposed of because of its condition.

Furniture recovery was significantly more difficult than in Berlin. Not all items could be refurbished or passed on. Approximately 650 items were recorded in Hanover. The main categories were lamps, desks, luggage racks, mattresses and slatted bed bases. Recovery rates varied considerably by furniture type (see Table 1).

Desks offered the best recovery prospects. Of 112 desks, 65 could be passed on. Another five remained in storage. The current recovery rate was therefore around 59%. A key operational challenge also emerged. Some desks had already been heavily used before clearance, including for construction work. Their condition was consequently worse than expected, requiring more desks to be discarded than planned.

It proved possible to pass on 90 of 112 luggage racks. The remaining 22 had to be discarded because of their condition and low demand. This shows that reuse depends not only on physical condition but also on market demand and suitability for potential new uses. Storage and marketing effort must also be considered.

The 350 assorted lamps represent an intermediate case. Approximately 50, particularly desk lamps, had been passed on. Others remained in storage at the time of the survey and were gradually being passed on through a flea market.

Fifteen of around 80 mattresses were donated, a rate of approximately 19%. Alongside condition, hygiene, age and acceptance by potential recipients are important. Reusing mattresses is typically more difficult than reusing hard furniture such as desks or shelves. Hotels generally replace mattresses after five to eight years for hygiene reasons, depending on requirements, condition, intensity of use, care arrangements and operational quality standards.

The 28 slatted bed bases could not be reused. This points to another structural barrier. The more customised or property-specific furniture is, the harder it is to reuse elsewhere. Standardised, modular furniture that is easy to dismantle therefore has much better prospects of a second use. At least the slatted bases could be melted down and, according to metal recycler A. Wulfekopf, fully recycled.

Item	Quantity	Passed on/stored/donated	Reuse rate
Desks	112	65	approx. 59%
Luggage racks	112	90	approx. 80%
Lamps	approx. 350	Approx. 50 passed on; others in storage	approx. 14% so far
Mattresses	approx. 80	15	approx. 19%
Slatted bases	28	0	0%

Table 1: Furniture from Hannover Medical Park that could be reused following clearance by kagota

© Leonardo Hotel Medical Park



Hotel furniture ready for refurbishment and resale

QUALITATIVE RESULTS

OPPORTUNITIES AND CHALLENGES

A comparison of the two pilots shows that remanufacturing hotel furniture is not purely a technical issue.[27] The decisive factor is **the interaction between product condition, process organisation and market access. Furniture must be secured in good time, carefully dismantled and protected from damage during clearance.**

Appropriate categorisation is also needed to pass items on through suitable channels. Damage or improper use before clearance significantly reduces subsequent recoverability. The results revealed **clear differences in the reuse potential of different product groups.**

- Standardised furnishings such as desks, lamps and selected accessories often have high reuse potential because they can be deployed flexibly.
- By contrast, reuse of customised products such as curtains is constrained by specific dimensions, design requirements or relevant fire safety rules.
- Quality or technical requirements and incompatibility with existing systems can prevent reuse of hygiene-sensitive products such as mattresses and slatted bed bases.

The results show that **material condition, product standardisation, regulatory requirements and intended use** are all decisive factors for the reuse of hotel furniture and equipment. Hard, standardised and well-preserved furniture such as desks or chairs is generally easier to pass on than customised, heavily worn or hygiene-sensitive items.

- In Hanover, desks were comparatively recoverable at around 59 %, whereas customised slatted bed bases often could only be recycled.
- Permanently glued glass panels proved challenging. New purchases should use the most modular construction possible (design for disassembly).

Another finding was **the importance of clearance timing.**

- If furniture is misused or damaged before clearance, for example during construction work, its residual value falls considerably.
- Future projects should therefore secure potentially recoverable furniture early. This could include clear instructions to construction firms and tradespeople not to use furniture as work surfaces, transport aids or substitutes for ladders.

Clearance projects in an operating hotel require **a high degree of planning, coordination and flexibility.**

- As this was a pilot for almost everyone involved, a substantial part of the learning process involved clarifying seemingly **minor but practically crucial procedures.** For example, responsibility for aids such as doorstops had to be allocated to ensure smooth logistics within the hotels.
- One of the most important findings was the **key role of early, continuous and transparent coordination.** Depending on the phase, up to five internal and external providers were involved simultaneously, requiring close alignment of their activities.
- Challenges arose because **housekeeping, clearance and renovation sometimes took place in parallel** whilst normal hotel operations continued without restriction. Existing infrastructure, especially lifts and logistics areas, had to be shared without affecting guests.
- Another challenge was **temporarily storing items still needed during renovation**, even though replacements had been ordered but not yet delivered. Renovated rooms had to return to service within days, requiring flexible interim solutions to maintain operations, logistics and a positive guest experience.
- It was also necessary to determine **whether certain materials were waste or could serve another purpose.** Pillows and duvets, for example, had to be assessed. Could they be used as protective padding for transport, or reused after cleaning?

Robust communication, clear responsibilities, a strong focus on solutions and willingness to test new, innovative approaches were all shown to be key success factors. A general contractor such as Eurotel Hospitality Solutions / GH Hotel Interior Group GmbH is also crucial to pursuing and coordinating these approaches across the team. **Pragmatism, adaptability and the ability to respond effectively to unexpected challenges** were equally important. Ultimately, the good project outcome rested on a combination between professional coordination, openness to innovation and close cooperation between all participants.

These practical experiences also showed that successful circularity in hotel operations depends not only on strategic concepts, but above all on the ability to resolve numerous operational details pragmatically, quickly and collaboratively.

SCALING POTENTIAL

Hotels are often completely cleared, with existing furniture disposed of indiscriminately or recovered only unsystematically. Leonardo Hotels' pilots show that early assessment of existing resources can unlock significant opportunities to extend product lifecycles. **Reuse and refurbishment of hotel furniture should be viewed as a scalable approach for further takeovers, renovations and operational repositioning across the chain, rather than as a one-off solution.**

Practical experience (including with Twins Company) shows that involving refurbishment providers early – ideally two to three months before renovation or takeover, including a free initial assessment – usually enables up to 80–90% of furniture to be usefully recovered over the longer term. Early assessment should ideally be embedded in planning, rather than taking place shortly before clearance as is often the case. This substantial potential is also reflected in Leonardo Hotels' trials of similar remanufacturing and recovery approaches in further projects, including Berlin, Magdeburg, Vienna and Dresden.

Eurotel's experience shows that furniture and lighting can be designed consistently for circularity. Reversible assembly instead of gluing is essential, allowing disassembly without damage. Upholstered furniture should ideally have removable, washable covers. Individual furniture components can also be made from recycled materials. Scratched mirror and glass surfaces can be restored using methods that do not leave distracting fogging. Existing wooden and metal surfaces can likewise be refurbished and reused via suitable processes. Special logistics arrangements can also enable mattresses to be washed rather than discarded, significantly extending their service life.

All future Leonardo acquisitions and operational hotel takeovers will assess whether existing furniture can be reused, refurbished, redistributed within the chain, passed on externally or materially recovered. The chain's focus is thus shifting from a linear model of new purchasing and disposal towards a more differentiated assessment of existing resources.

A brief look at Leonardo's follow-up projects:

- At Hotel Berlin Wilmersdorfer, it proved possible to reuse a substantial share of the existing furniture within the chain.
- In Magdeburg, the focus was on metal components, which were separately collected and fed into high-quality recycling loops.
- In Vienna, furniture was donated to charitable organisations, wood components were materially recovered and around 90% of minibars were reused or appropriately recovered. Safes, aluminium frames and lights were recycled. This reduced energy recovery to a minimum.
- Upcycling existing furniture offers further scaling potential. In Dresden, targeted improvements – such as adding a wooden element and new upholstery to an existing headboard – enabled a product to be upgraded and reused.

Circular hotel clearance is a coordinated effort across the entire reverse supply chain. **It requires assessment of existing furnishings to be integrated early into project planning, with specialist partners for clearance, refurbishment, remarketing and recycling all working together effectively.**



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PILOT PROJECT 3

REDUCE & RECYCLE

Less residual waste through better separation

MOTEL ONE

Motel One, Aachen
Time frame: 1 March 2026–31 May 2026

DESCRIPTION AND OBJECTIVE

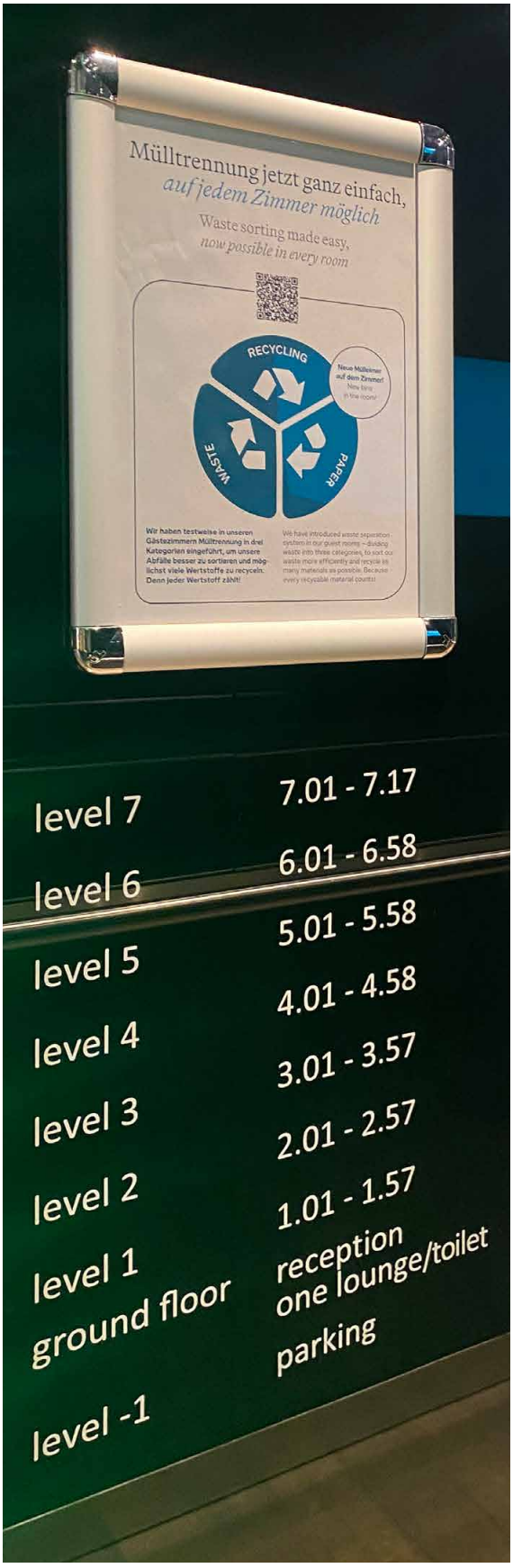
Since early 2025, Motel One Aachen has separated waste into five categories: residual waste, lightweight packaging, paper, glass and food waste. However, this was limited to operations and back-of-house areas. Only residual waste was collected from guest rooms. Existing back-of-house separation infrastructure was a prerequisite for selecting the location for the pilot. During the project, separate waste collection was introduced in all 259 guest rooms.

The project aimed to reduce residual waste and shift waste volumes towards recyclable categories, considering both environmental benefits and potential cost savings.

PARTNERS INVOLVED

- **Logex** handles disposal and waste reporting for Motel One Group Germany.
- **Motel One:**
  - Housekeeping staff and external cleaning provider
  - **Area Technical Management:** responsible for waste across Motel One's regions
  - **Hotel manager:** responsible for implementation, training internal and external staff, evaluating results and adjusting bin provision
  - **Hotel guests:** informed about the introduction of in-room waste separation through posters in the lifts

© Motel One



Waste separation in the rooms at Motel One in Aachen

STRUCTURE AND APPROACH

The Aachen pilot built on a 2025 precursor project, in which some guest rooms on one floor of a Cologne hotel were fitted with waste bins with separation inserts. Lessons learned there – including the need for closer initial support for housekeeping staff to ensure correct sorting – fed directly into preparations for the whole-hotel rollout in Aachen.

Before rollout, all hotel staff were informed and prepared for the new waste separation system in an approximately 45-minute face-to-face training session.

As many externally employed cleaners do not speak German, training was multilingual, including English, Arabic and Russian, and strongly image-based, with practical examples of each waste category.

Existing housekeeping trolleys were not designed to collect several waste categories separately. An additional compartmentalised insert was therefore developed and purchased to hold extra bags, avoiding the need to attach loose bags to trolleys. Three labelled inserts – residual waste, plastic and paper – were fitted into the existing guest-room bins. All rooms were equipped within a few days while operations continued.

METHODOLOGY

- The **quantitative analysis** uses 2025 historical waste data for Motel One Aachen, collected and supplied by central disposal partner Logex. Waste volumes were analysed by category, the effects of changing bin provision were extrapolated and potential cost savings estimated. A target plan prepared by Logex was also used as a conservative benchmark.
- A complementary **qualitative study** examined participants' perspectives on the pilot. Semi-structured interviews were conducted with Motel One Aachen's Resident Manager, the responsible Area Technical Manager and a Logex representative. Interviews explored operational processes, practical implementation barriers and opportunities for a group-wide rollout.

QUANTITATIVE RESULTS

Motel One Aachen generated 28.2 tonnes of residual waste in 2025. Shortly after introducing the new separation system in March 2026, residual waste fell significantly while lightweight packaging volumes increased. At the end of the trial in late May 2026, a change in bin provision was therefore ordered. **One residual-waste bin was cancelled, and an additional lightweight-packaging bin was requisitioned.** The hotel now has three residual-waste bins and two lightweight-packaging bins. Two calculations provide a meaningful range for expected annual volume savings. A conservative extrapolation based on the target plan gives savings of around 4.6 tonnes of residual waste per year. Using actual 2025 collection frequencies, including additional collections, savings are as much as 8.9 tonnes annually.

© Motel One



Guest rooms were equipped with waste bins with separation inserts.

28.2 TONNES
of residual waste were generated at Motel One Aachen in 2025, before the trial began.

This difference reflects variations in bin fill levels and additional collections depending on hotel occupancy. By way of comparison, an adult African elephant weighs around 6,000 kilograms. Projected annual residual-waste savings at one hotel therefore correspond to 1 – 1.5 elephants.

The change in bin provision yields projected savings of around 31.5% of annual residual-waste disposal costs. No offsetting costs arise since the expectation is that the additional lightweight-packaging bin will be provided free through the municipal collection system.

One-off implementation costs were approximately **€5,300**. This figure is made up of around €2,800 for guest room bin inserts and €2,500 for housekeeping trolley inserts. No separate training costs arose since cleaning staff were trained internally during normal working hours.

QUALITATIVE RESULTS

OPPORTUNITIES AND CHALLENGES

Guest acceptance and operational feasibility
The pilot was clearly positive. Guests accepted in-room waste separation without significant complaints. They sorted waste intuitively, without detailed on-site explanations and in a way which was consistent with the earlier Cologne project. One positive guest review specifically mentioned the new in-room waste separation system.

Implementation also went more smoothly for staff than initially expected. Adding inserts to existing bins changed neither cleaning procedures nor room appearance significantly. Emptying and wiping the inserts fitted seamlessly into existing housekeeping processes. Project leads actively supported cleaners on the floors during the first few days to ensure correct separation.



8.9 TONNES
of residual waste were saved annually through consistent waste separation at a comparable hotel.

Training had clearly been understood, and implementation worked without major corrections.

SCALABILITY

The pilot shows that in-room waste separation can be extended during normal hotel operations without major disruption. The trolley solution and multilingual, image-based training concept can be transferred directly to other locations. For a group-wide rollout, early central purchasing is recommended to avoid supply shortages and secure volume discounts. New hotels could plan for appropriately designed housekeeping trolleys from opening.

Cost-neutral housekeeping operations
The change caused no additional costs for the external cleaning provider, since emptying and wiping inserts integrated seamlessly into existing procedures. Internal training also incurred no separate costs, taking place during normal working hours.

CHALLENGES

Procurement and lead times
Developing and procuring customised inserts for existing bins took longer than planned, delaying the original start. Future rollouts should allow sufficient procurement lead time, especially for bespoke solutions.

Municipal and legal complexity when changing bin provision
A key challenge was obtaining additional recycling bins. Depending on the municipality, local regulations and hotel property ownership, the rules for ordering additional lightweight-packaging bins vary and often cannot be managed directly by the central disposal partner. These bins frequently belong to a separate dual collection system, funded through packaging manufacturers' licensing systems and organised locally. Ordering additional bins can therefore require lengthy research and coordination. Future rollouts should clarify local regulations and tenant/landlord responsibilities early, preparing the necessary authorisations where required.

Data collection and measurability
Collecting reliable waste data proved complex. Collection volumes and frequencies vary with actual bin fill levels and do not directly correlate with weight. For valid impact assessment in future rollouts, standardised data collection by waste category is recommended from day one.

© ALISEO GmbH



Waste bins with sorting compartments for hotel rooms

Bag size
Separate collection temporarily resulted in relatively underfilled bags for each category. Smaller bags should be considered when scaling up to avoid unnecessary plastic consumption.

SCALING POTENTIAL

Outlook and recommendations for a group-wide rollout
Following the positive results, waste separation at Motel One Aachen will continue indefinitely. The pilot showed that implementation is operationally feasible, is accepted by guests and staff and involves manageable investment. Recommendations for extending it to other Motel One Group locations are as follows.

- **Clarify municipal rules early:** before launch, check site-specific regulations for additional lightweight-packaging bins and tenant/landlord responsibilities.
- **Central procurement:** consolidate orders for bin inserts and trolley solutions across the group to reduce supply risks and obtain volume discounts.
- **Standardised training:** Aachen's multilingual, image-based format can serve as a template for other locations, potentially as an e-learning module with knowledge checks.
- **Collect data from the outset:** agree structured recording of waste volumes by category with the disposal partner from day one, enabling impact comparisons across locations.
- **Smaller bags:** when scaling up, use sizes suited to each site's waste categories to minimise plastic consumption from underfilled bags.



© Coprid/Getty Images

PILOT PROJECT 4

RECYCLING

Using high-quality recycled material[28] from a closed loop

LEONARDO *Hotels*

Leonardo Hotels, Ruhr region
Time frame: 18 December 2025–31 June 2026

DESCRIPTION AND OBJECTIVE

Fruit salad is a regular breakfast offering at most Leonardo Hotels, generating around 17,510 large fruit salad buckets (5 litres) annually. Other food containers, including sauce containers (8,822 containers each weighing 5 kg, 2024 figures), are either reused locally for other purposes, such as collecting coffee grounds or transporting eggs, or discarded as commercial waste.

This illustrates how standardised, recurring procurement for breakfast, kitchens and catering generates large volumes of packaging waste every day in hotels. Although much of this packaging is technically recyclable, valuable raw materials are often lost in mixed commercial waste.

Across Germany, only around 50 % of plastic packaging is mechanically recycled.[29 30] Most of the rest is recovered as energy. A major reason for this is the quality of collection streams. Mixing different plastic types, colours, labels, adhesives, residues and contaminants creates heterogeneous streams with limited suitability for high-quality recycled material production.

High-quality polypropylene (PP) packaging in particular offers substantial potential. Clean, traceable, single-material collection can achieve much higher recycling rates and more consistent material properties. Recycling practitioners estimate that a controlled, clean[31] input stream can yield rates of 75–80 %.[32] Efficiency could therefore improve even further through continuous operation.

The project therefore aimed to create a high-quality material stream for recycling through separate collection of PP packaging in hotels.

PARTNERS INVOLVED

- **Jokey Group** is a family-owned plastics processing company headquartered in Wipperfürth and one of the world's leading manufacturers of rigid plastic packaging. Its range includes buckets, tubs and trays for food and non-food contents, including food, animal feed and construction materials.
- **REMONDIS SE & Co. KG** is a large German recycling, water management and municipal and industrial services company based in Lünen. Active in more than 30 countries, it is one of the world's largest private water and recycling service providers.
- **Leonardo Hotels**: kitchen staff at a hotel in Dortmund

STRUCTURE AND APPROACH

The pilot examined how to establish a controlled PP material loop between hotel operations, recycler and packaging manufacturer in practice (see Fig. 7).

- Recycling company REMONDIS and packaging manufacturer Jokey are already working together in a pilot to establish a closed material loop for used PP buckets from commercial kitchens. The aim is to collect and process single-material PP packaging separately and, in future, use the recycled material for new food packaging.
- REMONDIS collects, sorts and processes the used buckets, while Jokey uses the recycled material to manufacture new packaging.[33] Success depends on establishing a sufficiently large, stable, high-quality stream of used PP packaging.
- Hotels in particular offer significant potential because they regularly generate larger quantities of bulk PP packaging.

PP packaging from Leonardo hotel operations, including fruit salad buckets, can provide an additional valuable input to Jokey and REMONDIS's existing material loop.

QUANTITATIVE RESULTS

Since late 2025, Leonardo Hotel Dortmund has separately collected PP buckets previously used for food and handed them to REMONDIS. The precise weight has not been recorded. Four collections have taken place, each containing approximately 35 kilograms of material,[34] amounting to around 140 kilograms in total. REMONDIS recycles the food packaging in a closed material stream,

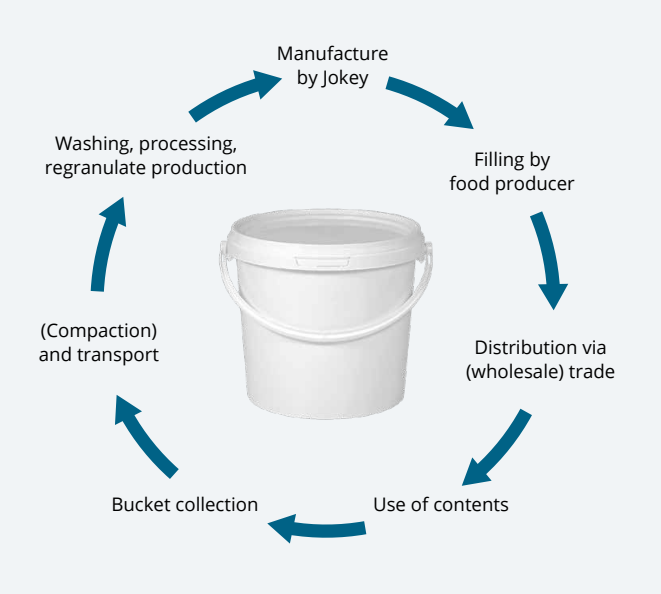


Fig. 7: PP material loop linking packaging manufacturer, food producer, hotel operations and recycler

supplying recycled PP to Jokey to manufacture new high-quality buckets. This can save a total of 35–90 % of virgin material.[35]

To date, mechanically recycled PP has not been approved by the European Food Safety Authority (EFSA) for direct food contact. This also reflects strict legal requirements for food-contact products to protect consumer health and safety.[36] In this pilot, buckets are collected, returned and materially recycled in a closed loop, avoiding contamination from other input streams. This is an important step towards food-grade recycled PP.



© Leonardo Hotel Dortmund

Collection of the buckets at the Leonardo Hotel in Dortmund

Following a positive EFSA opinion,[37] food-grade recycled PP could eventually be produced.[38]

QUALITATIVE RESULTS

OPPORTUNITIES AND CHALLENGES

This pilot has provided Leonardo Hotels with valuable insights. One of these is that the greatest challenge is organisation and staff involvement rather than technology.

1 Staff motivation is a decisive success factor. The project largely depends on staff willingness to incorporate an additional step, however small, into daily work. Early involvement, transparent communication of the project's benefits and simple handling achieved high acceptance. Particularly encouraging was that many staff wanted not only to cooperate but to participate actively and contribute to success.

2 Circularity must be easy to integrate into existing processes. Sustainable solutions only work within hotel operations over the long term when they fit into established workflows with minimal complexity. The pilot shows that small adjustments can be enough to provide high-quality material streams for the circular economy.

3 Space requirements present virtually no barrier. Separate PP bucket collection requires very little space. The entire collection process took place within a few square metres, making the concept suitable in principle for hotels with limited storage or back-of-house areas.

4 The operational effort is much lower than expected. Introducing the collection system required neither structural alterations nor complex processes. All that was needed was a defined collection point, a suitable transport trolley and a willingness to collect empty packaging separately, instead of placing it directly in the recycling bin for disposal. Additional work per package is minimal.

5 Small operational details determine efficiency. Collecting lids proved particularly challenging during operations. They often fell out of collection containers or disrupted the process. A separate collection device or holder for lids would help optimise future rollouts.

6 Digitalisation offers further potential. The project showed scope to improve packaging traceability. Recording packaging with QR-code or barcode scanners directly on the collection trolley could in future facilitate automatic assignment to manufacturers, to distributors and to material streams. This would greatly simplify data collection, volume monitoring and documentation.

According to REMONDIS, a key finding is the critical importance of fully emptying and pre-cleaning used PP buckets. Organic residues, such as leftover fruit salad, not only impair material quality but can also hinder upstream steps such as baling or further processing at the recycling plant. Trials with heavily contaminated containers achieved recycling rates of only around 50%, whereas rates up to 80% appear realistic with clean inputs. Investigations are underway into whether prolonged contact with food residues harms material quality so severely that use in new food packaging becomes impossible. Input quality clearly depends substantially on handling immediately after emptying. At the same time, additional cleaning must remain economically viable.

Leonardo Hotels' central finding is that closed plastic loops are unlikely to fail primarily because of space, technology or costs, but rather because of insufficient coordination. A few square metres, simple collection logistics and committed staff can transform a previously partly discarded waste stream into valuable secondary raw material for new packaging. Strong team acceptance also shows that staff actively support sustainability projects when benefits are clear and implementation is simple.

'Collection is very easy to organise. If you have the storage space – and it does not need to be much – there is really no reason not to do it.'

Moritz, chef at Leonardo Hotel Dortmund



© Marc Elias/Getty Images

5 CIRCULARITY IN THE HOTEL INDUSTRY BEYOND THE PILOT PROJECTS

Some businesses already apply circular economy principles across hotel operations, from room interiors to food service. The examples in this chapter show the diversity of possible approaches. Some hotels replace individual products with more durable or refurbishable alternatives, while others fundamentally rethink entire room concepts.

Successful circular solutions can be found both in small, family-run independent hotels and in international chains. They often involve close cooperation with specialist manufacturers and service providers with viable take-back, refurbishment or recycling expertise and facilities. This effective cooperation is precisely what makes many projects replicable. What works in one hotel can often be transferred to other locations or even entire hotel groups.

The following selection of best practices (Table 2) is not exhaustive and deliberately includes varied approaches by hotel type (chain versus independent), area (rooms, bathrooms, food service, furniture/interiors) and R-strategy (Reduce, Reuse, Recycle, Refurbish/Remanufacture). The aim is to broaden perspectives. The projects illustrate a much wider range of possible measures and encourage hotels to look beyond these examples for solutions suited to their own operations.

Hotel	Area	R-strategy
Iberostar Hotels & Resorts (chain)	Holistic	Reduce (systematic waste prevention)
Hotel Luise, Erlangen (independent)	Holistic / rooms	Reuse, Recycle, Cradle to Cradle[39]
Staudacherhof / RECUP, Garmisch (independent)	Food service	Reuse
25hours Hotel Bikini Berlin / KALDEWEI (chain)	Bathroom	Refurbish, Remanufacture
Motel One München-Deutsches Museum / Zollikofer & Pfleiderer (chain)	Furniture / interiors	Recycle

Table 2: Circular economy best practices

IBEROSTAR GROUP

PREVENTING WASTE FROM THE OUTSET

Consistent waste prevention for zero landfill

Iberostar Group is a family-owned Spanish tourism business with a history of around 70 years. It comprises approximately 100 four-star and five-star hotels with around 32,000 rooms in 13 countries. It integrates circular economy principles into hotel operations via its 'Wave of Change' initiative, working closely with suppliers, locations and industry partners.

The circularity initiative arose because municipal waste disposal was considered inadequate at many Iberostar locations. The group therefore redesigned hotel operations to prevent waste wherever possible. Working with procurement, operations, product sustainability, design and construction teams, it examined products, packaging, purchasing decisions, construction processes and operational workflows to extend product life, minimise waste and maximise resource value throughout the lifecycle.

To structure the necessary changes in thinking and processes, Iberostar established dedicated 3R teams (Reduce, Reuse, Recycle), involving more than 250 employees. Each waste stream is recorded using standardised protocols and digital monitoring systems, providing reliable data and clear accountability. Hotel teams use this information to identify waste prevention opportunities, optimise resource management and drive continuous improvement.

Innovation strengthens this approach. Artificial intelligence (AI), now used in more than 60 hotel kitchens, helps reduce food waste – the largest waste stream in all-inclusive hotels – by optimising production planning, purchasing, menu design and service delivery.

Iberostar reduced its waste volumes by 79% in 2025 by combining waste prevention, data-driven processes, innovation and local cooperation. Guest engagement supported this change. 78% welcomed Iberostar's efforts. This demonstrates that circular solutions can improve the guest experience rather than compromise it.

Best practice: Iberostar's radical 'Reduce' approach. Dedicated 3R teams work with operations, purchasing, housekeeping, food and beverage, and sustainability departments to ensure waste is continually prevented, measured and reduced. By weighing and monitoring every waste stream, Iberostar enables data-driven decisions that improve performance and identify new circular innovation opportunities. As a result, around 80% of Iberostar's hotel waste can be avoided, reducing waste entering the environment.[40]

'We must create a resilient and responsible tourism model.'"

Gloria Fluxà, Vice-Chairman and Chief Sustainability Officer, Iberostar Group



© Iberostar

Reuse also prevents waste (here we see a water bottle being refilled at a dispenser).

HOTEL LUISE

THE RENEWABLE HOTEL ROOM[41]

Circular construction and hotel interiors
Hotel Luise in Erlangen has been family-run since 1956. Since the 1980s, it has pursued and continuously developed a consistent sustainability strategy. Its vision is to become a 'hotel of cycles'.

Hotel Luise created its 'renewable hotel room', one of the first in Europe to be developed according to Cradle to Cradle principles, as long ago as 2016. All materials were selected for return to either biological or technical cycles. Waste prevention and viewing materials as future raw materials begin at the planning stage.

The rooms feature renewable wood-based materials, carpet tiles made from recycled fishing nets, materials separable into pure streams, and durable, circular products. Every material decision takes account of resource conservation, disassembly and reusability.

Ten years of daily hotel use have shown that circular interiors are not only technically feasible, but also durable and economically viable. Materials have performed well under demanding guest use, contradicting critics who claim that circularity is merely a pilot or niche issue.[42]

Building on this experience, Hotel Luise is currently developing the 'renewable hotel room 2.0'. Material cycles will be separated even more consistently. One room category will focus on biological cycles using renewable and compostable materials. A second will focus on technical cycles, demonstrating how high-quality materials can be kept permanently in closed loops.

Best practice: circularity need not be limited to individual products or recycling measures.



© Benjamin Förtsch/Hotel Luise

Furniture made from natural and recycled materials

It can start with the design of hotel rooms and buildings. The project also provides long-term evidence. Ten successful years show that circular materials can withstand hotel requirements over the long term and remain economically viable. The 'renewable hotel room 2.0' develops the concept further, making biological and technical cycles directly tangible for guests.



© Benjamin Förtsch/Hotel Luise

A meeting, inspiring workshop, family celebration or yoga class: anything is possible!

STAUDACHERHOF RECUP

STAUDACHERHOF GARMISCH & RECUP: REUSE TO PREVENT LITTER IN A NATURE RESERVE

Reusable takeaway cups instead of disposables
The 49-room Staudacherhof in Garmisch-Partenkirchen has belonged to the Staudacher family since 1907. In 2019, they also took over Klammhaus in the Partnach Gorge in the Bavarian Alps, at the foot of the Wetterstein mountains – a protected natural area.[43]

On taking over the restaurant, they introduced the RECUP reuse pool system for takeaway hot drinks to prevent disposable packaging from littering the habitat.[44] Since then, takeaway drinks for hikes have only been served in reusable deposit packaging. Approximately 80–100 reusable cups are issued daily, avoiding around 2,700 disposable cups per month[45] and 32,000 annually.[46]

Although guests were initially sceptical, the service is now well accepted. One advantage is the provider's dense return network, particularly the return point at Munich Central Station. Introducing reusable food packaging, however, was unsuccessful. Biodegradable packaging made from bagasse – fibrous plant residues – is now used instead.

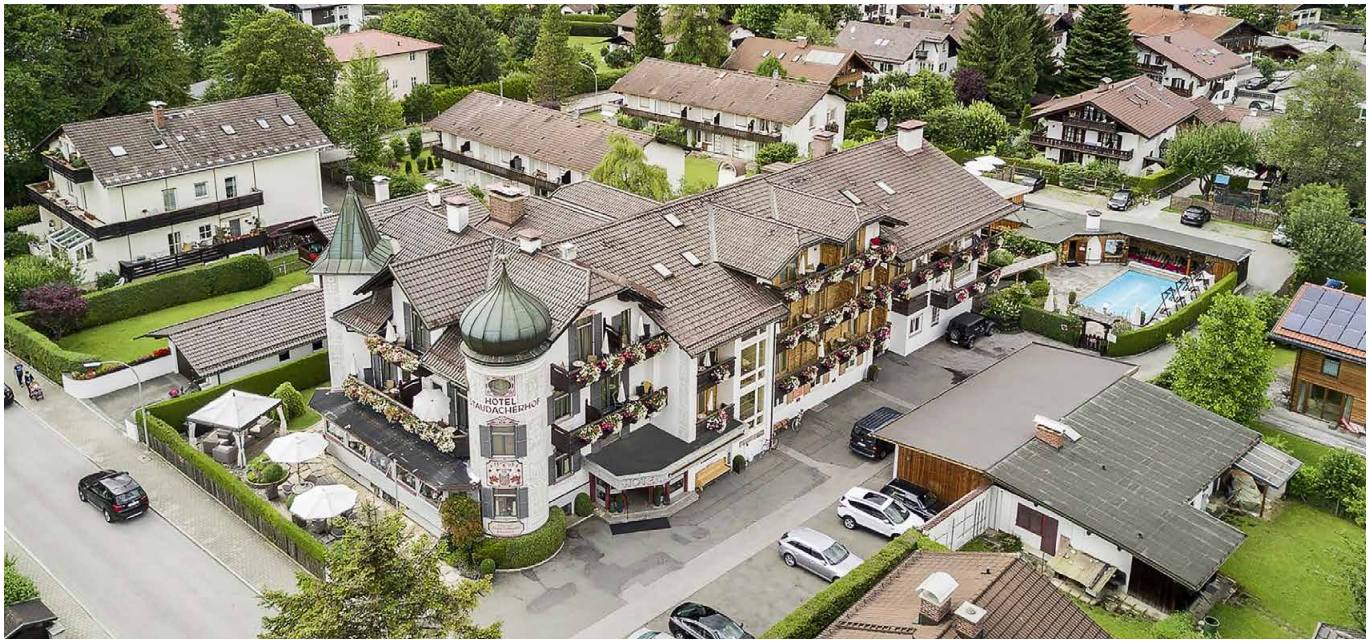


© RECUP

The RECUP reuse pool system was introduced in 2019.

Best practice: reusable deposit cups prevented thousands of disposable takeaway cups from entering a protected nature reserve.

Beyond this example, other hotels exceed legal requirements and actively integrate reuse solutions into their operations. Leonardo Royal Hotel Nürnberg, for instance, offers RECUP reusable takeaway packaging as standard.


© Staudacherhof

Staudacherhof in Garmisch-Partenkirchen: takeaway drinks are served exclusively in reusable deposit packaging.

25h berlin/bikini **KALDEWEI**

25HOURS HOTEL BIKINI BERLIN & KALDEWEI: BATHROOM REFURBISHMENT

Refurbish to as-new condition instead of throwing away
25hours Hotel Bikini Berlin is a design hotel in Berlin-Charlottenburg, right next to Berlin Zoo. Opened in 2014, it has 149 rooms. The 25hours group has 18 hotels in European cities including Hamburg, Berlin, Paris, Copenhagen and Florence, and international cities such as Jakarta, Dubai and Sydney.

To mark its tenth anniversary, Hotel Bikini Berlin joined forces with the bathroom manufacturer KALDEWEI to implement a pioneering circular economy project for commercial properties. For the first time at this scale, used shower surfaces and baths were removed, refurbished and reinstalled as fully functional products – an approach still exceptional in the industry.

One specific case in point is the KALDEWEI baths and showers, which had been used for around ten years. During renovation in early 2025, they were removed and thoroughly restored via a multi-stage upcycling process, including sandblasting and re-enamelling, before being reinstalled a week later.

Around 50% of shower surfaces and baths remained in use,[47] without any compromises regarding appearance or quality compared with new products.



© KALDEWEI

Refurbished to as-new condition: luxury and sustainability go together here.

Best practice: according to KALDEWEI, refurbishing used shower surfaces and baths at 25hours Hotel Bikini Berlin reduced CO_2 emissions by 65% compared with manufacturing new bathroom products.

The manufacturer received the 2026 German Sustainability Award for this concept.[48]



© KALDEWEI

MOTEL ONE MÜNCHEN-DEUTSCHES MUSEUM, ZOLLIKOFER & PFLEIDERER GERMANY[49]

Wood recycling in renovation projects
Hotel renovations regularly generate large amounts of waste wood from furniture and fittings. These are usually sent for energy recovery, leaving material recycling potential unused. Against this background, the redesign of Motel One München-Deutsches Museum included a broad wood-based materials recycling project. The aim was to recycle as much replaced furniture and interior fittings as possible during floor-by-floor refurbishment while the hotel remained open and to reuse the old wood in new particle board. Waste management company Zollikofer handled processing, storage and transport of the wood biomass. The processed material was then delivered to particle board manufacturer Pfleiderer and made into new particle board.

Following six months of planning, the hotel was renovated between December 2023 and April 2024. Around 120 tonnes of waste wood were materially recovered. This would otherwise very probably have been used for energy recovery.

The wood recycling concept is now being applied to further renovations across the chain. Motel One is also working with partners to integrate other room materials into circular value chains. The carpet installed, for example, has Bronze Cradle to Cradle certification.

Best practice: an innovative closed loop sent 120 tonnes of wood for material recycling, with potential to scale up.

Lessons from the project
Recyclingquote: Recycling rate: maximising the rate is essential to achieve environmental comparability with energy recovery. Rates decline through collection, processing and cleaning. Contaminants such as coatings and composites make 100 % technically almost impossible. → **Action:** consider separation into pure material streams when planning and designing furniture and fittings.

Late involvement of value-chain partners: disposal companies and panel manufacturers usually join only after room design. → **Action:** hold a joint design workshop with all partners at the outset to design furniture for recycling from the start.


© Motel One Münschen

Guest room Motel One München-Deutsches Museum

No financial incentive: recovery has so far broken even without added economic value. → **Action:** long-term contracts with guaranteed volumes create planning certainty and can offset higher costs, for example for bio-based adhesives. Policy must also redress the often one-sided financial support for waste-wood energy recovery. Commitments to prioritise material use over energy recovery, such as those in the Circular Economy Act, must be translated into policy implementation.

Responsibility is the bottleneck, not infrastructure: despite regional differences, Germany already has well-developed waste-wood sorting and processing infrastructure. → **Action:** companies must take responsibility and deliberately direct wood streams towards material recovery rather than towards energy recovery. In the absence of such a conscious consumer decision, disposal providers often favour incineration for economic reasons.

Policy priority rather than isolated projects: individual take-back schemes and pilots are important spaces for innovation and learning. However, effective national collection and sorting systems offer the greatest circular economy impact. Only these can capture the large volumes needed for widespread material use of waste wood. Expanding and improving them should therefore be a policy priority.

6 RECOMMENDATIONS FOR HOTELS AND POLICYMAKERS

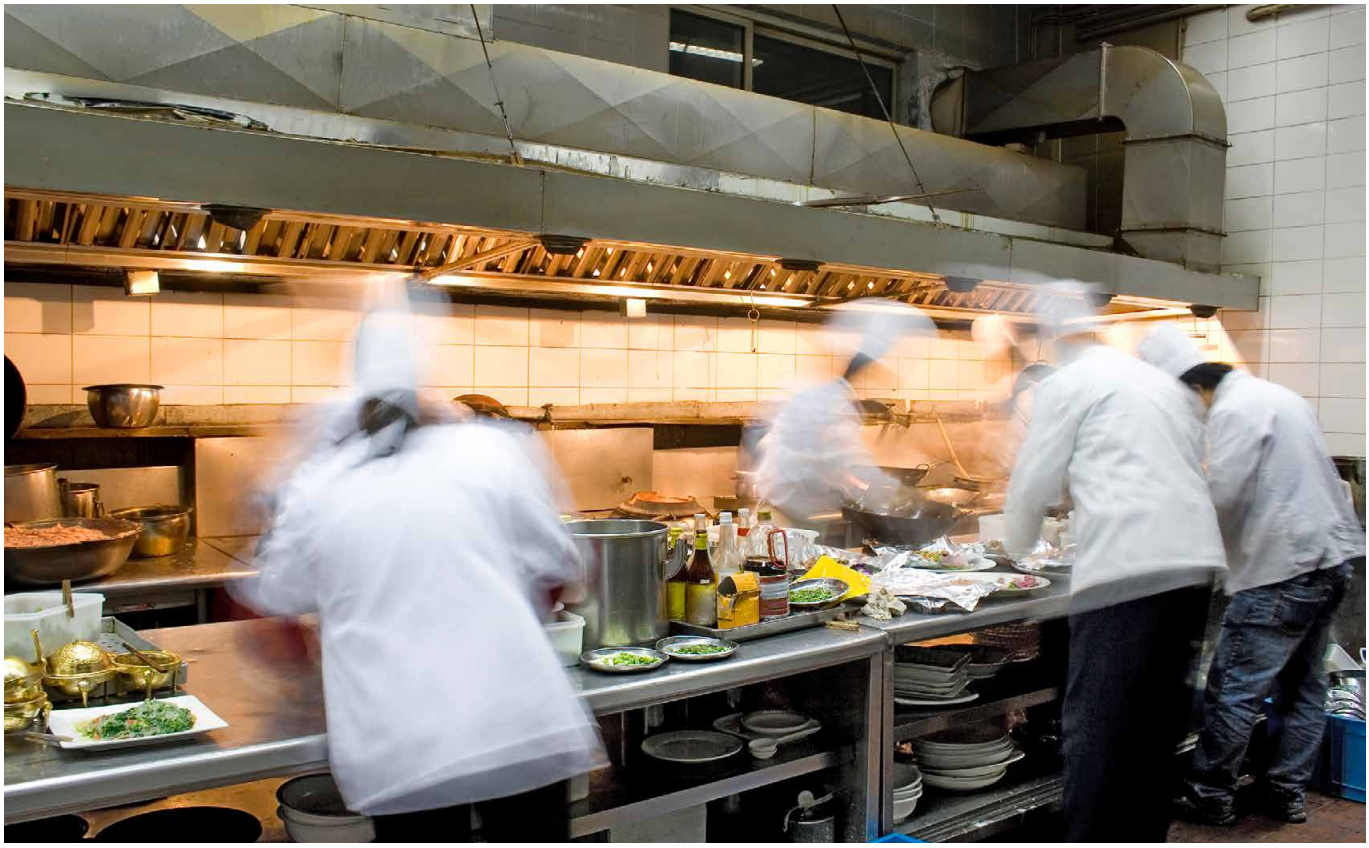
Growing requirements under the EU Packaging Regulation and increasingly scarce global resources, illustrated by Earth Overshoot Day, are increasing the pressure to keep raw materials and materials in circulation for longer. The pilots presented show that many innovative approaches already work, both environmentally and economically.

The pilot projects presented offer enormous potential for long-term adoption and wider use. The hotel industry should therefore do the following.

- Review existing processes to identify where single-use systems can be replaced with more resource-efficient reuse systems.
- Carefully assess, at openings or takeovers, whether existing furniture can remain in use or find a meaningful second use. Assessing old furnishings should become a fixed, standardised step in renovation or takeover planning, rather than starting shortly before clearance, as is often the case.
- Systematically identify opportunities to improve waste separation and further reduce residual waste through changes, targeted communication and the raising of awareness.
- Examine separate single-material collection of short-lived but high-quality packaging.

The examples in Chapter 5 also show that high-quality bathroom fittings can readily be refurbished, that reusable takeaway drink packaging is well received and helps keep nearby recreation areas litter-free for guests and that installed wood can already be recycled to a high standard in a closed loop.

© iPandastudio/Getty Images



Beyond these pilots, every hotel and hotel chain should explore circular economy opportunities holistically and strategically.

This calls for the **development of a comprehensive circular economy strategy** that systematically integrates circular principles throughout the business—from the building itself to procurement, room design, and waste and resource management. Clear targets, measurable indicators and defined responsibilities provide the foundation for continuous implementation and development. Resources are used more efficiently, waste is prevented, material loops are closed and environmental and economic potential is realised over the long term. Some elements of a circular economy strategy are shown in Figure 9.

A clear regulatory framework creates investment certainty

Businesses need investment and planning certainty. The PPWR requirements are an important component, but only work alongside further regulatory measures and reliable implementation. All economic sectors must consistently move towards greater circularity. Reliable implementation is crucial. Postponed deadlines, requirements weakened retrospectively or political U-turns undermine investment certainty. Positive examples include the Ecodesign Regulation and the Digital Product Passport.

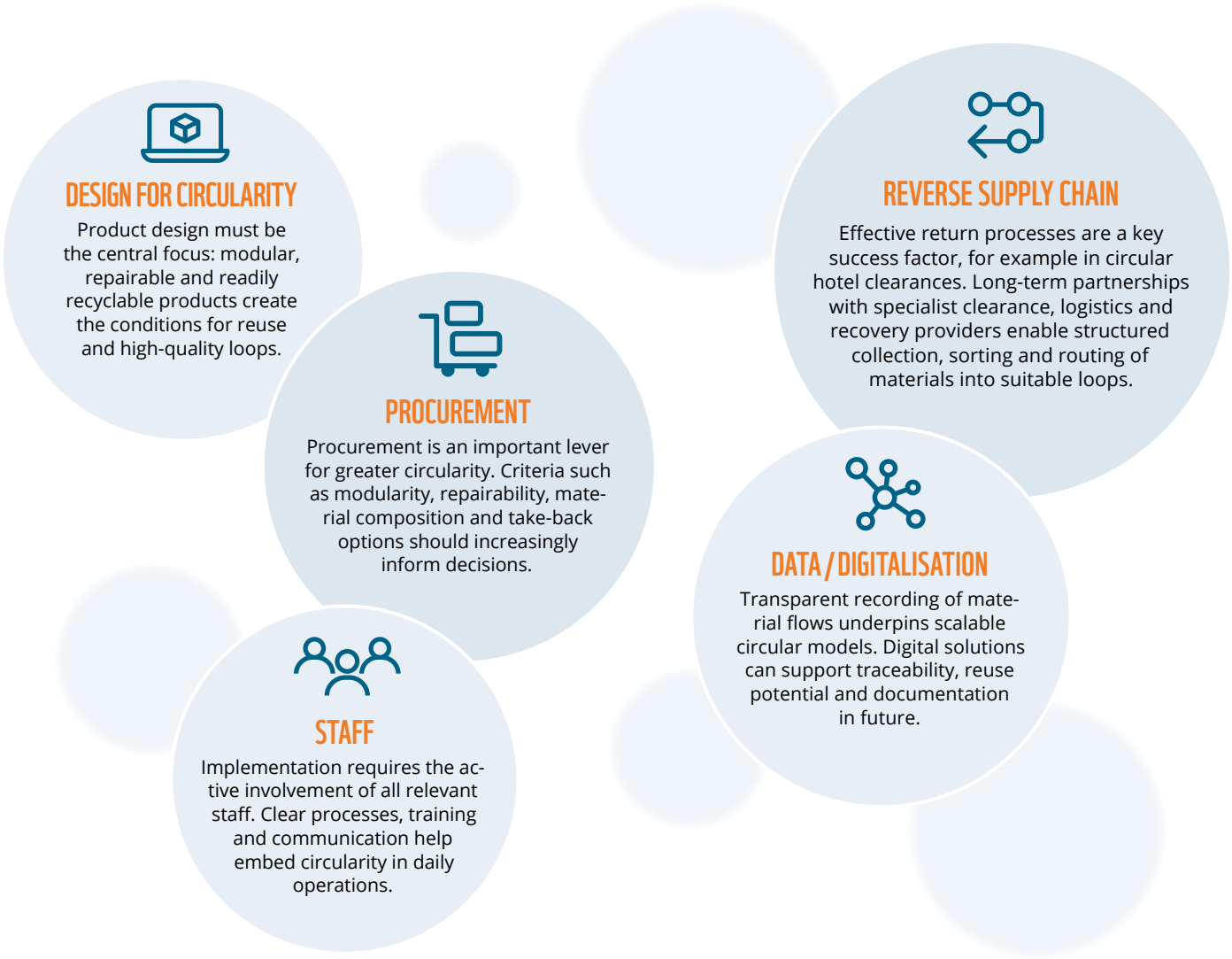


Fig. 9: Recommendations for establishing circular supply chains in hotels (from Motel One and Leonardo Hotels)

7 IDEAS TO PUT INTO PRACTICE

Circular economy measures in hotels can be considered at two levels: construction and buildings, for example during renovations, conversions or takeovers; and operations, covering day-to-day purchasing, use and disposal.

Both follow the same circular economy hierarchy – reuse before recycling before disposal (see Fig. 1) – but differ with regard to frequency, decision-makers and time horizon. Building measures are less frequent but have substantial impact. Operational measures are ongoing and often incremental. Drawing on the pilots discussed here, a hotel or chain could begin implementing circular economy measures as follows:[50]

Many questions begin with data availability
What data is already available on current waste generation and material consumption, for example by hotel area such as kitchen or rooms?
Are supplier guidelines, lifecycle assessments and carbon footprints available?
Is there knowledge of future waste streams and material requirements?
Which circular approaches are already established (leasing, rental models)? Which measures have been piloted? Why were they not scaled up?
Purchasing
Is there knowledge of upstream value chains (product origin, lifespan, material analysis, resource consumption, etc.)?
To what extent does purchasing consider circularity, such as circular materials, second-hand furniture and modularity?
Does purchasing fast-moving consumer goods also minimise material use (e.g. reducing secondary packaging such as outer packs and films, or using reusable/standardised pooled containers)?
To what extent are circular economy labels or certifications considered?
Use
What is done to extend product life, e.g. refurbishment, modular replacement, second uses or longer replacement cycles?
Are products leased, rented, etc. (product as a service)?
What is repaired?
Are products leased, rented, etc. (product as a service)?
How much waste separation takes place?
What happens after disposal (recycling, energy recovery)?
What happens to discarded products?

Table 3: Questions to explore circular economy potential. Source: project partners

1 Clarify data availability: what is known about resource flows? See also Table 3; collect data where necessary.

2 Create a matrix or grid covering daily operations (rooms, bathrooms, kitchens, fitness areas, shops, etc.), the different phases (purchasing, use, sale/disposal) and, where known, long-term building investments (renovations, new purchases, etc.). See Table 4.

3 Develop and consider potential measures along the circular economy hierarchy, involving relevant staff.

4 Ideally, use data (materiality analysis) to prioritise and define measures and plan implementation.

a. Select pilots using criteria such as effort/impact and staff involvement.

b. Discuss implementation in detail in workshops with relevant staff, drawing on external expertise or constructive challenge where needed.

c. Plan for scaling successful pilots from the outset and prioritise those that can become permanent or appear scalable.

5 Define clear implementation responsibilities.

Before the pilots, the partners developed an initial, non-exhaustive set of **questions for use as a self-check or diagnostic tool (Table 3)**, and a draft **matrix or grid** covering different hotel areas and relevant circular economy opportunities **(Table 4)**.

A workshop involving staff from Leonardo Royal hotels

in Nürnberg, Köln Stadtwald and Berlin, and Leonardo hotels in Berlin Mitte and Hamburg Altona also produced the following table of opportunities for specific circular economy measures (Table 4).

The table shows the following:
a) which data can be useful;
b) the different hotel areas for circular economy measures, such as rooms, bathrooms, kitchens and restaurants;
c) the phase in which action can be taken, such as purchasing, use or disposal; and
d) whether the item is a durable good or a consumable. Durable goods are used over a longer period, while consumables are generally wholly or largely used up during use.

Involving hotel staff significantly influenced the design of the pilots. It became clear how many people in a wide range of roles are enthusiastic about greater circularity and lower resource consumption in hotels, and willing to contribute.

Our sincere thanks to everyone involved. Your commitment makes a difference!

Topic	Purchasing	Use	Sale / disposal
Cross-cutting topics (applicable to all areas): ■ **Data:** record waste streams, material requirements and resource consumption (LCA, value chain, carbon footprints); certifications (EMS, Green Key, etc.); supplier guidelines ■ **Knowledge:** consolidate learning from existing and past measures			
Room & bathroom furnishings (durable goods)	Durability, modularity, circular materials		Refurbishment / second use, donation of fittings
Textiles (towels, etc.) (durable goods)	Durability	Repeated use of textiles / towels	Use as cleaning cloths
Kitchen & restaurant (durable goods)	Origin, resource consumption and durability of electrical appliances	Reusable takeaway systems (coffee, lunch packs, etc.)	Refurbishment / second use, donation of fittings
Bathroom amenities / hygiene (private/public) (consumables)	Bulk packaging and refilling	Refillable dispensers (reuse); single-use products only on request	Single-material collection, reuse or high-quality recycling
In-room items (consumables)	Avoid small units / individual packaging	Water dispensers / reusable bottles	Single-material collection, reuse or high-quality recycling
Food & food waste (consumables)	Reduce small units / individual packs (e.g. buffets); optimise best-before dates and purchasing quantities; reduce packaging / reuse	Avoid waste during storage	Manage surplus / waste, waste separation, organic waste / composting
Reusable containers (B2B/B2C)	B2C: reusable containers for boxes, condiments, jam, yoghurt B2B: refillable logistics containers (e.g. yoghurt)		Single-material collection, reuse or high-quality recycling
Own shop	Focus on resource reduction (no miniature packs, reusable options, etc.)		Single-material collection, reuse or high-quality recycling

Table 4: Opportunities for specific circular economy measures from Leonardo Royal hotels in Köln-Stadtwald, Nürnberg and Berlin, and Leonardo hotels in Hamburg Altona and Berlin Mitte

ENDNOTES

1) B2B ('business to business') refers to commercial relationships in which one company sells products or services to another rather than to private customers.

2) PP food buckets are made of polypropylene, a robust plastic, and are suitable for and used in food storage or transport.

3) Hereafter: remanufacturing.

4) UNEP – United Nations Environment Programme (2024): Global Resources Outlook 2024: Bend the trend – Pathways to a liveable planet as resource use spikes. International Resource Panel, Nairobi.

5) Global Footprint Network (2026): Earth Overshoot Day 2026 falls on July 30th. https://www.footprintnetwork.org/

6) WWF Germany (2026): German Overshoot Day. 8 May 2026. https://www.wwf.de/2026/mai/deutscher-overshoot-day

7) Eurostat (2025): Circular material use rate (dataset, code: cei_pc020). European Commission. https://ec.europa.eu/eurostat/databrowser/view/cei_pc020/default/table?lang=en

8) Circle Economy (2026): The Circularity Gap Report 2026: The value gap. https://dashboard.circularity-gap.world/report/2026/cgr-2026-overview

9) BMUKN – Federal Ministry for the Environment, Climate Action, Nature Conservation and Nuclear Safety (2024): National Circular Economy Strategy (NKWS). https://www.bundesumweltministerium.de/themen/kreislaufwirtschaft/kreislaufwirtschaftsstrategie

10) European Environment Agency (2025): Circular material use rate in Europe. https://www.eea.europa.eu/en/analysis/indicators/circular-material-use-rate-in-europe

11) UBA – German Environment Agency (2022): Resource Report for Germany 2022: Resource use in Germany. https://www.umweltbundesamt.de/themen/abfall-ressourcen/ressourcenschonung-in-produktion-konsum/ressourcennutzung-in-deutschland; UNEP (2024): Global Resources Outlook 2024.

12) Prakash et al. (2023): Model Germany Circular Economy.

13) WWF Germany and UN Global Compact Network Germany (2024): Circular Economy Strategy Guide: Step by step towards an impact-oriented circular business. Strategie_Leitfaden_–_Circular_Economy_2024.pdf

14) All four pilots described here mainly concern operations. The major opportunity presented by buildings was therefore unfortunately not examined in detail.

15) German National Tourist Board (n.d.): Sleep particularly well here – certified accommodation in Germany. https://www.germany.travel/de/feel-good/uebernachten.html

16) Turner, M. J. und Hesford, J. W. (2019): The impact of renovation capital expenditure on hotel property performance. In: Cornell Hospitality Quarterly, 60(1). S. 25–39. https://doi.org/10.1177/1938965518779538; HVS (2014): Hotel management contracts in Europe. 24.4.2017. https://www.hvs.com/article/7993-Hotel-Management-Contracts-in-Europe

17) German Economic Institute (IW): Future Panel. Cited in: Global Compact Network Germany & WWF Germany (eds.): Circular Economy Strategy Guide.

18) Lichtenthäler, U. & Neligan, A. (2023): How Circular Are Businesses in Germany. Cited in: Global Compact Network Germany & WWF Germany (eds.): Circular Economy Strategy Guide.

19) European Parliament & Council of the European Union (2025): Regulation (EU) 2025/40 of 19 December 2024 on packaging and packaging waste, amending Regulation (EU) 2019/1020 and Directive (EU) 2019/904, and repealing Directive 94/62/EC. Official Journal of the European Union, L 2025/40. https://eur-lex.europa.eu/eli/reg/2025/40/oj

20) An exception applies where packaging is supplied with takeaway food for immediate consumption without further preparation.

21) Authors of the project for the 'Deep Dive Business Challenge' course: Amelie Bolle, Johannes Stefanowski, Lena Weber, Johanna Michelsen, Johanna Wetterkamp, Elisabeth von Wulffen, Leonie Krause, Chiara Wachholz and Franziska Wolff.

22) Approximately 145 grams per bucket, 38 grams per lid and 4 grams per handle.

23) Main rejection reasons included mechanical damage such as deep grooves, cuts or fork marks caused, for example, by opening buckets with knives or screwdrivers or removing fruit salad with cutlery. Permanent marker markings and labels or adhesive residues that could not be fully removed during cleaning, or whose food-contact compliance had not been approved, also led to rejection or reworking.

24) See Chapter 6.

25) Hereafter: Twins Company.

26) 'Luggage racks' are folding frames or stands in hotel rooms on which guests place suitcases to unpack, rather than on the floor or bed.

27) It also matters whether a project concerns initial furnishing, supplementary purchases or taking over existing furnishings. This was not examined further in these pilots.

28) Recyclate is a secondary raw material obtained by recycling used materials, such as plastic waste, and can replace newly manufactured virgin material in production.

29) See Conversio Market & Strategy (2024): Summary: Plastics flow diagram for Germany 2023 – Facts and figures on the lifecycle of plastics. AVK, BDE, bvse, FSK, GKV, IG BCE, IK, VCI. https://www.vci.de/ergaenzende-downloads/kurzfassung-stoffstrombild-2023.pdf (slide 21: 'Around 1.6 million tonnes from packaging applications were mechanically recycled [output-based measurement], corresponding to a recycling rate of around 51.4%.')

30) German Environment Agency (2023): Packaging consumption rose again in 2021. https://www.umweltbundesamt.de/themen/verpackungsverbrauch-2021-erneut-gestiegen

31) Also referred to as 'scraped-clean emptying'.

32) This figure comes from an expert discussion with a leading recycling company.

33) See https://sustainability.jokey.com/en/jokey-group-and-remondis-group-working-together-for-a-closed-loop/

34) These estimates combine recycler information, images of the collected packaging (see Fig. 7), and the weights of individual containers and lids.

35) This estimate is based on expert assessments by REMONDIS and Jokey.

36) More information on EFSA and the food-contact suitability of recycled plastics: https://www.efsa.europa.eu/en/topics/topic/food-contact-materials

37) The assessment is currently underway.

38) Jokey (2026): Jokey Group and Remondis Group: Working together for a closed loop in the food industry. Jokey Sustainability. https://sustainability.jokey.com/en/jokey-group-and-remondis-group-working-together-for-a-closed-loop/; Remondis (2024): Closed loop in the food industry. Remondis Aktuell. 13.5.2024. https://en.remondis-aktuell.de/messages/closed-loop-in-der-lebensmittelindustrie-2/

39) Cradle to Cradle is a design concept in which products are designed from the outset so that all materials can return fully to biological or technical cycles after use, rather than becoming waste.

40) See also Iberostar Group (2024): Wave of Change: 2023 year in review. https://waveofchange.com/wp-content/uploads/2024/02/Iberostar_WaveofChange_2023YearinReview-1-1-1-1.pdf

41) See also https://hotel-luise.de/storys/das-nachwachsende-hotelzimmer/

42) See also https://www.luise.eco/kommunikation/wall-of-change/

43) Garmisch-Partenkirchen (n.d.): The Partnach Gorge. https://www.partnachklamm.de

44) Staudacherhof (n.d.): The Garmisch hotel and RECUP. https://staudacherhof.de/das-hotel-garmisch-und-recup/

45) Calculation based on 90 cups per day.

46) Estimates are based on information supplied by the owner of Staudacherhof and Klammhaus in a personal conversation.

47) The information is based on a personal conversation with representatives of 25hours Hotel and KALDEWEI.

48) TGA – Building Services Magazine (2025): Bathroom refurbishment. A second life for hotel bathrooms. https://tga.at/sanitaer-design/zweites-leben-fuers-hotelbad; arcguide+ (2026): Award-winning circular economy in project business. https://www.arcguide.de/produktneuheiten/kaldewei-gewinnt-dnp-2026-fuer-nachhaltige-badloesung/; hotelier.de (2026): Intelligent bathroom solutions from KALDEWEI. https://www.hotelier.de/lieferanten/ausstattung-technik/intelligente-badloesungen-von-kaldewei

49) More information: https://www.pfleiderer.com/dach-de/magazin/motel-one-muenchen

50) See also the Circular Economy Strategy Guide for businesses: https://www.wwf.de/nachhaltiges-wirtschaften/circular-economy/strategie-leitfaden

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