Examples of circular innovation exist across industries

Several companies have already **put circularity at the core of their business model**, in many cases through innovative partnerships and collaboration.

While by far not an exhaustive list, the following examples represent a **selection of case studies**, highlighting the implementation of circular solutions at **various points of the value chain** and through **different levers.**

Those circular solutions were achieved through **new collaborations**, as well as **technical innovation** and can serve as **inspiration across industries.**

With m-use, Mitsubishi makes a bold shift to a pay-per-use for its elevator business

M-use

Mitsubishi has launched a full **lift as a service** to their customers with pay-per-use and full servicing. Mitsubishi's goal is to acquire **50% of its division's revenue** through M-use and ensure that all components of returned M-Use elevators are recycled and/or reused

The new model is based on **connectivity** and real time data analysis. **Billing** is done on a **per-use** basis and service and **maintenance** is based on this **real time use data**, providing accuracy and optimal care

The **product as a service model** allows for **tailored maintenance** based on actual usage and for control over **optimal reuse** and recycling

Source: Company website

MITSUBISHI ELECTRIC
MITSUBISHI ELEVATOR EUROPE

Werflink developed a platform for sharing excess construction materials

The Werflink Sharing Platform

Werflink provides a **digital and app-based platform** on which construction companies can **offer their excess production materials**, creating increased transparency on material and component availability in a region. An **analytical backbone** exists to optimize the market efficiency in the long term

The platform was implemented through a **collaboration between public and private players** within the circular construction industry, as well as a **technology start-up** providing the technical backbone

Over 300 construction companies are active on the platform

Source: Company website

Maersk certifies its ships with the cradle to cradle passport to improve material recovery

The cradle to cradle passport

The cradle to cradle passport **identifies every component of the ships,** incl. 60,000 tons of steel, making **improved recycling** possible for most materials as well as safe disposal for the rest. Based on this, it will be **possible to reuse nearly all material in new ships**

An **online database** will be created to show a detailed inventory for each ship. The database can be **updated and maintained throughout the lifecycle** of the ship, and provide improved understanding of the materials at the end of life

Knowing about the materials in a ship **increases the value for Maersk**, as it increases the resell value and reduces the cost for input materials when using recycled materials from old ships. It has an **impact beyond the shipping industry** in transforming the way steel recycling is dealt with globally.

MAERSK

Source: Company website

Zenrobotics enables automated recognition and sorting of materials for reuse/recycling

Zenrobotics

Zenrobotics builds **robots** that can **sort a variety of materials** both in existing material recovery facilities and demolition sites. With its robots, they are able to provide a **simple, unmanned sorting process** and makes waste sorting **safer, more accurate** and profitable and increase availability of materials **for reuse and recycling**

Zenrobotics harnesses the power of **artificial intelligence** to boost the quality and efficiency of waste sorting. The combination of **sensors**, **heavy-duty robot arms** and **unique AI** enables superior recognition and sorting material

By **leveraging and combining different technology innovations**, Zenrobotics is able to massively improve sorting of materials and thus facilitates the **first crucial step of closing the loop** on a variety of materials

Source: Company website

P&G lead technology development to tag packaging for sorting and high-quality recycling

The Holy Grail Project

The Holy Grail Project aims to close loops by improving sorting of post-consumer packaging with the help of **chemical tracers and digital watermarks in the form of an optical code.** This will improve both quality and quantity of recycling material

The project was set up in **collaboration with players along the packaging value chain**, including brand owners, plastic producers, waste collectors and packaging producers and the Ellen MacArthur Foundation

The project **established a proof of concept**, showing applicability of the technology within existing recycling facilities. It is now being rolled out at larger scale, driven by P&G in collaboration with further industry players

Source: Company websites

The Amsterdam Economic Board facilitates public-private partnerships

Public-private partnerships towards the circular economy

The Amsterdam Economic Board **brings together governments, companies and knowledge institutions** in their path to the circular economy

Public-private partnerships enable a **network** of entities to work together on challenging questions that they cannot solve by themselves

The Amsterdam Economic Board induced the **collaboration between five mattress producers** (Ikea, Beter Bed, Auping, Swiss Sense and Hilding Anders) to take responsibility for the end-of-life of mattresses. Today, already more than 75% of all mattresses are being recycled (compared to 33% before the collaboration)

Source: Amsterdam Economic Board website

Terracycle launched the Loop initiative to reuse packaging at scale

The Loop initiative

Terracycle launched the **Loop initiative**: through a global ecosystem of industry players, consumers receive their products in durable and reusable packaging which is cycled over and over again

A horizontal network of major brands and retailers, including direct competitors, provides sufficient scale for the initiative to succeed

Loop is now available in the UK, France and the US, and **continues to expand** in 2021 with launches in Canada, Japan, Australia and Germany

Source: Company website

Renault and Suez commit to a strategic partnership through a joint venture, INDRA

The joint venture INDRA

Renault teamed up with Suez, a specialist in the management and recycling of waste, for the **end-of-life treatment of vehicles**

INDRA, the joint venture between Renault and Suez, brings together **complementary assets** in order to optimize the value of end-of-life vehicles

INDRA achieves **95,7%** recuperation of car mass. Moreover, INDRA allows Renault to **scale up** new recycling routes and solutions for better and cost effective dismantling

Source: Company websites

Madaster creates digital material passports for buildings to improve reuse of components

The Madaster Platform

Madaster creates fully digital **material passports** for buildings and construction objects through which all information on used materials are made transparent and readily accessible

Madaster has built a **strong network** of leading stakeholders from industry leaders to financial institutions, research institutes and design and architecture studios to continuously **improve its product** and **increase its value and usability**

By registering materials, every building becomes a **material bank for the future**. Knowing what materials and products are within the building enables **reuse and recycling of components, simplifies** renovations and allows for innovative financial solutions backed by material collateral

Source: Company website

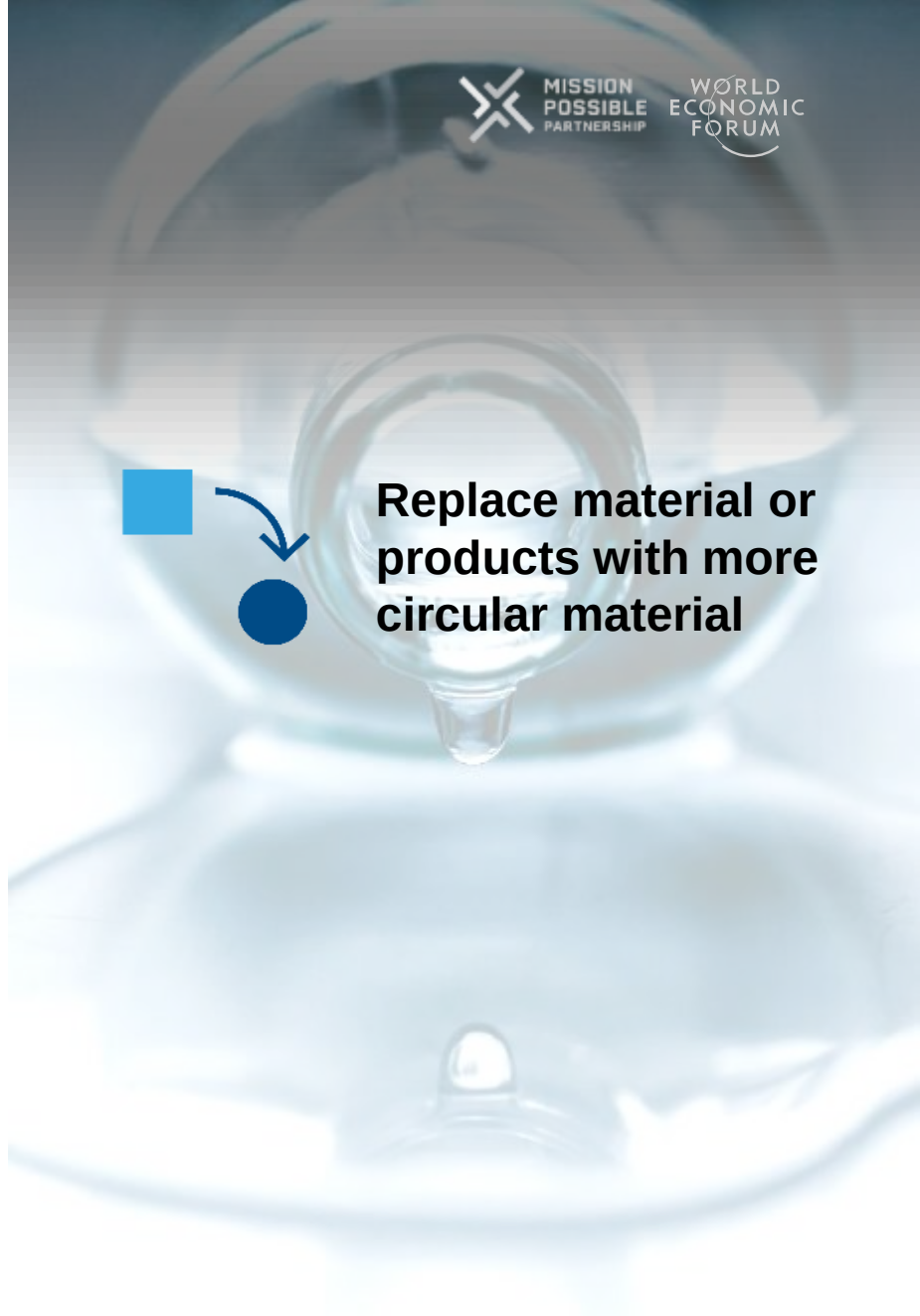
Alpla and BillerudKorsnäs invested in Paboco, to produce sustainable paper bottles

The joint venture Paboco

Paboco, creates paper bottles designed for circularity using renewable materials that harmlessly degrade in nature

Alpla, a bottle manufacturing specialist, together with Billerud-Korsnäs, a paper packaging material developer acquired start-up Paboco. Pooling complementary assets in a **separate start-up entity, allows for fast prototyping of innovative solutions**

Through its ‘Pioneer’ community, Paboco has built up a **considerable network** of champions such as Carlsberg, L’Oréal, Coca-Cola and Absolut



Source: Company websites

JR Central reuses and recycles aluminium from its high-speed trains

Recycling of Tokaido Shinkansen aluminium

Retired high-speed trains are disassembled. JR developed a **new screening method for aluminium alloys**, which make up the majority of the train body, **to sort and separate different alloys** and reduce downcycling

JR developed the new technology in collaboration with Harita Metals and other companies within a **committee set up by the Japan Aluminium Association** to promote closed-loop recycling. The technology is now being certified and scaled up

Aluminium from decommissioned trains is reused directly in new trains in a step towards closed-loop recycling, **keeping the material at a high quality level**. E.g., the luggage racks in new trains achieved 10% recycling rate

Source: Company website

Signify revolutionizes the way we see lights

Circular lights

Signify is offering **light as a service** to, e.g., airports, factories, offices, schools. They remain **owner** of the lighting systems and are responsible for the maintenance and repair

Signify **collaborates with public entities** such as Schiphol Airport to implement high-profile pilot use cases

Signify achieved 100% **carbon neutrality** in 2020

Source: Company website