

Circular Construction

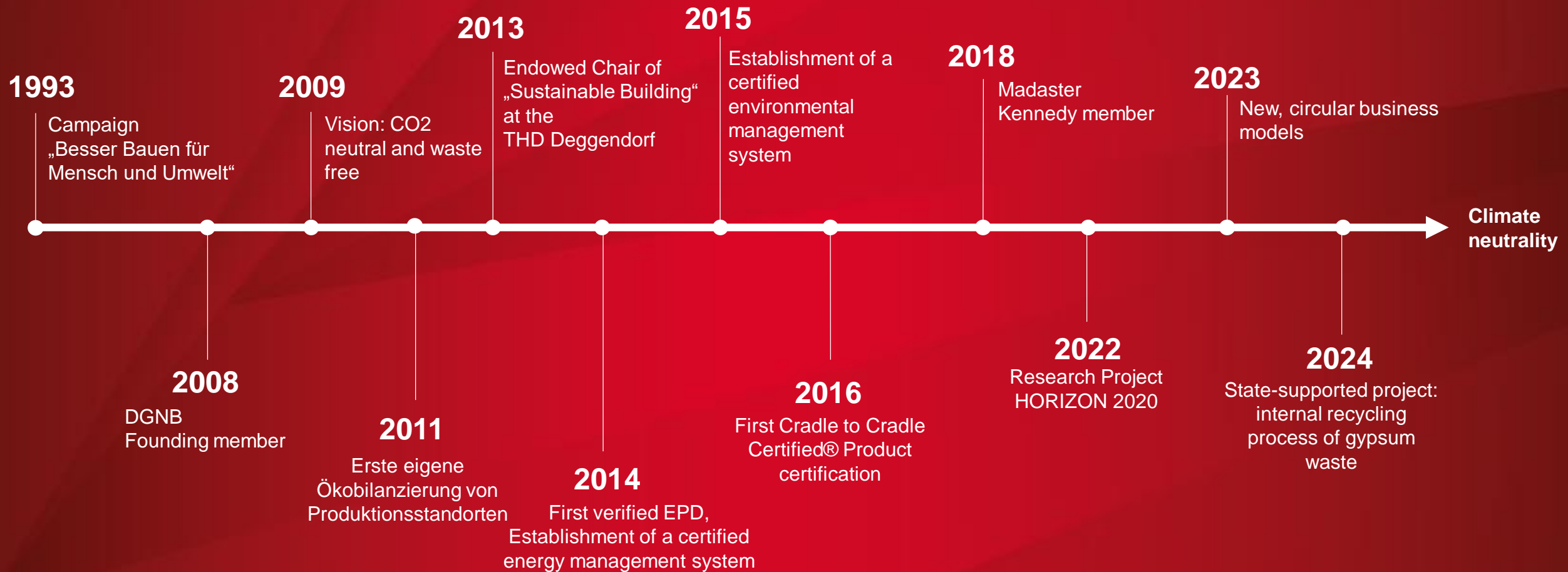
We live Material Circularity!

Our Visions and motivations for circular economy

- **Our Vision since 2008:**
„Waste-free and climate-neutral production“
- **Waste and climate:**
Disposal costs and landfill capacities
- **Resource use and security of supply:**
FDG gypsum and metals
- **Responsibility:**
Construction industry as a source of 50 % of waste generated in Europe

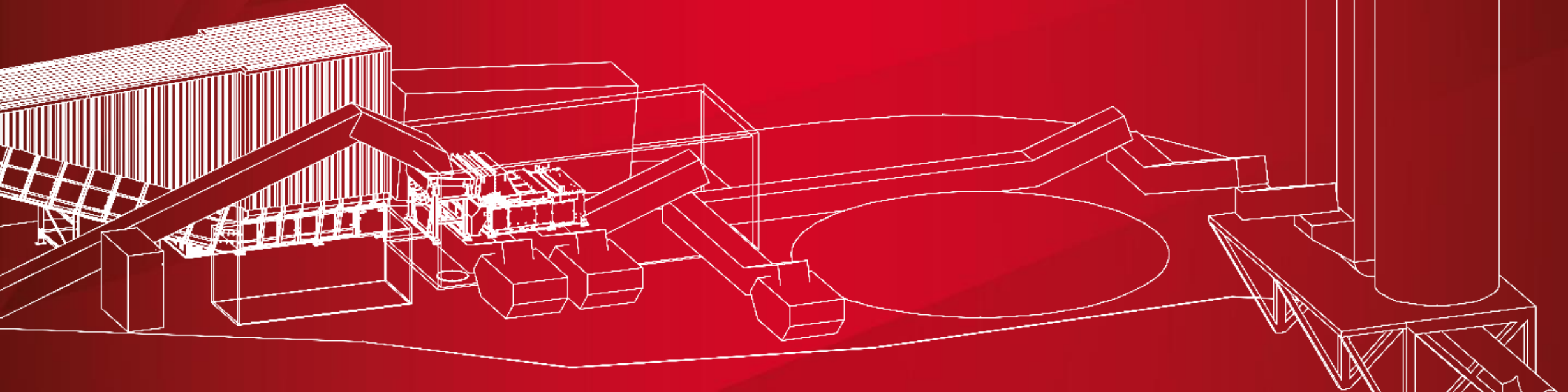


Environmental Milestones



Circular Material and Product management

Material circularity with Lindner



Conserve

- After professional installation, the original product is used and maintained in the location for the longest possible period of time.
- The product is given optimum value in this process.
- The conservation of the functional quality is guaranteed by services in the form of maintenance or repair.



Starting Point

Product example

Concepts for long-term conservation of our products

Facades

- Element facades
- Hybrid element facades
-

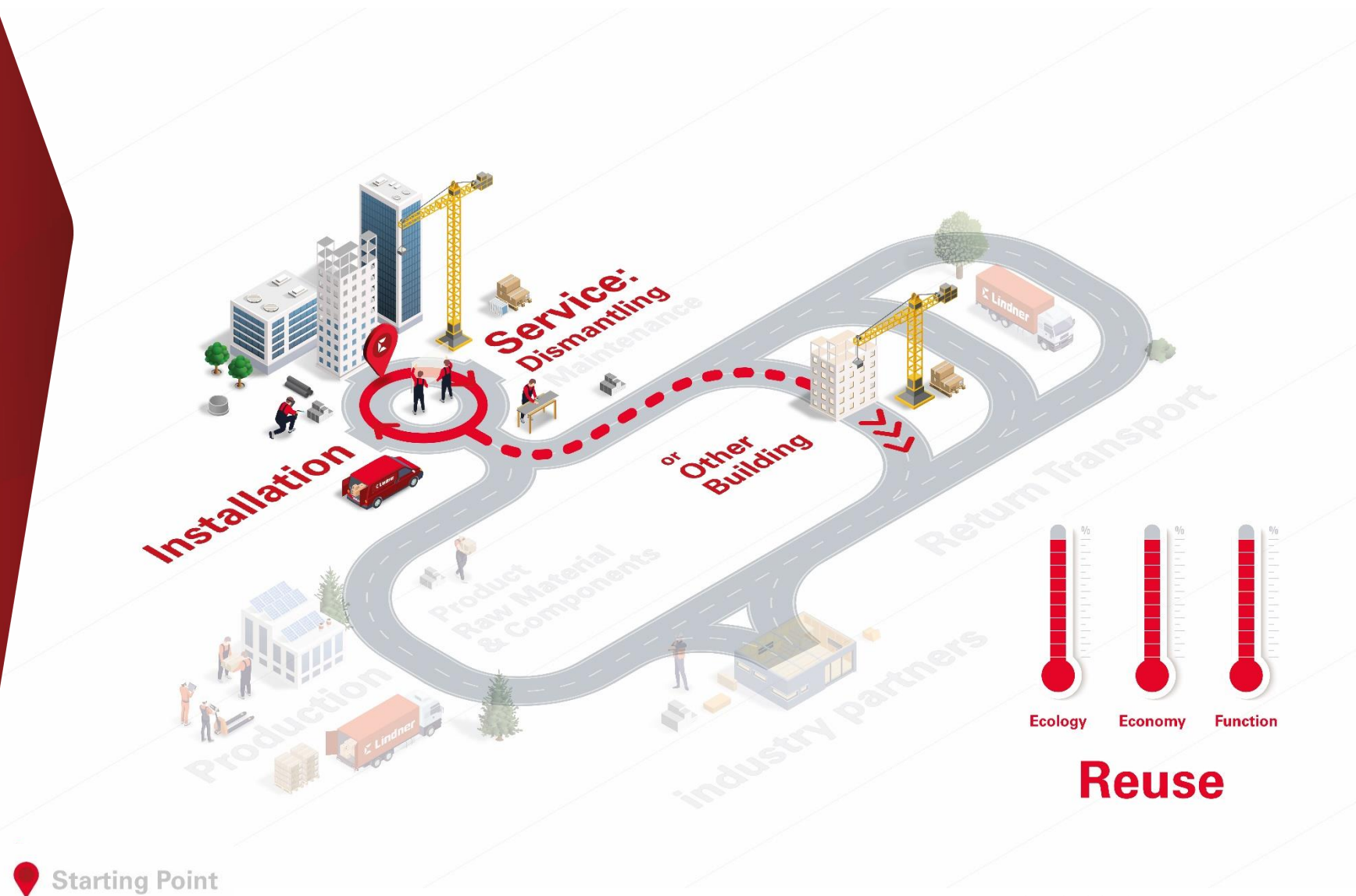
Durability through:

- Constructive wood preservation
- Correct use of materials in terms of building physics
- Functional preservation through maintenance: proper cleaning, preventive repairs, inspection of hardware components.



Reuse

- The primary product is dismantled and directly reused without any refurbishing.
- The product can be used either in the same or in a different building.



Product example

Reuseable systems

- **Ceiling systems**
 - LMD metal ceilings
 - Plafotherm® metal ceilings
 - Baffle ceilings
- **Partition / Doors**
 - Dismountable and displaceable partition wall systems



Concular Circularity Partner

Cooperation partner: Lindner Group and MUCBOOK

Lindner and MUCBOOK start a cooperation with Concular to promote **resource efficiency** in the construction and real estate sector. For this purpose, three sophisticated workplace concepts are looking for a new home.

Result: MUCBOOK Cubes as work, education and business spaces with creative tape design by **TAPEMOSS**.

TOGETHER, CIRCULAR.

Concular ×  Lindner
MUCBOOK



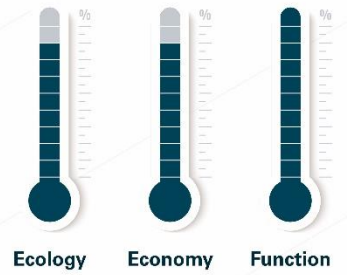
Sources:

<https://concular.de/de/blog/lindner-group-als-kooperationspartner-von-concular/>

 Lindner

Refurbish

- The primary product's components are returned to production after disassembly.
- The components of the product are reprocessed and serve either the original or a new purpose.



Refurbish

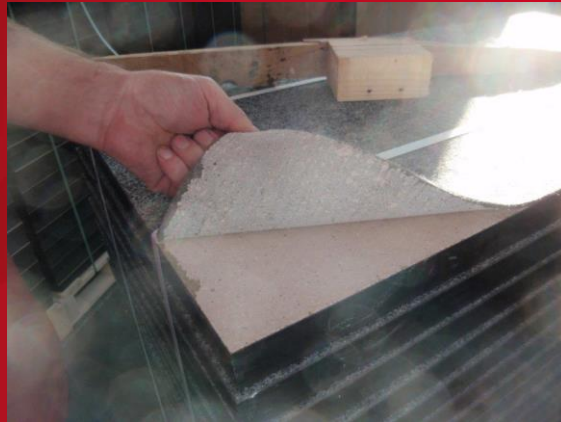
Possible procedure for returning of floor panels



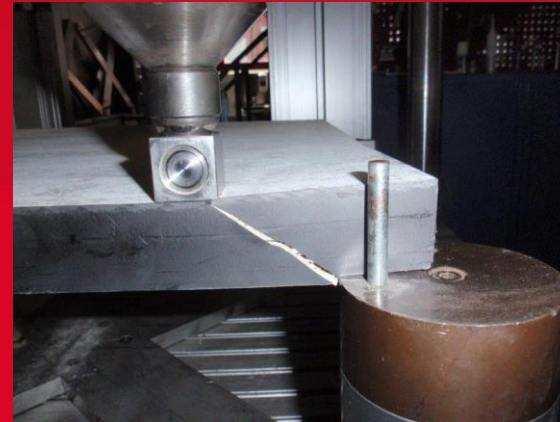
From dismantling to preparation



Panels in the
refurbishment project



On site inspection



Testing the physical properties



Preparation of the surfaces

Product example

Refurbishable systems

Floors

- Raised floor panels
- Hollow floor panels

Refurbished floor systems

- Raised floor LOOP
- Hollow floor ADDLIFE



Reprocessing

- The individual **components** of the product are separated and reused as **material** in the manufacturing process.
- Left-over materials from production, reconstruction, construction sites or from industry partners are dissolved in their form and used as raw substance for the manufacture of our products.
- Materials that cannot be recycled by ourselves end up in an external material or substance cycle.

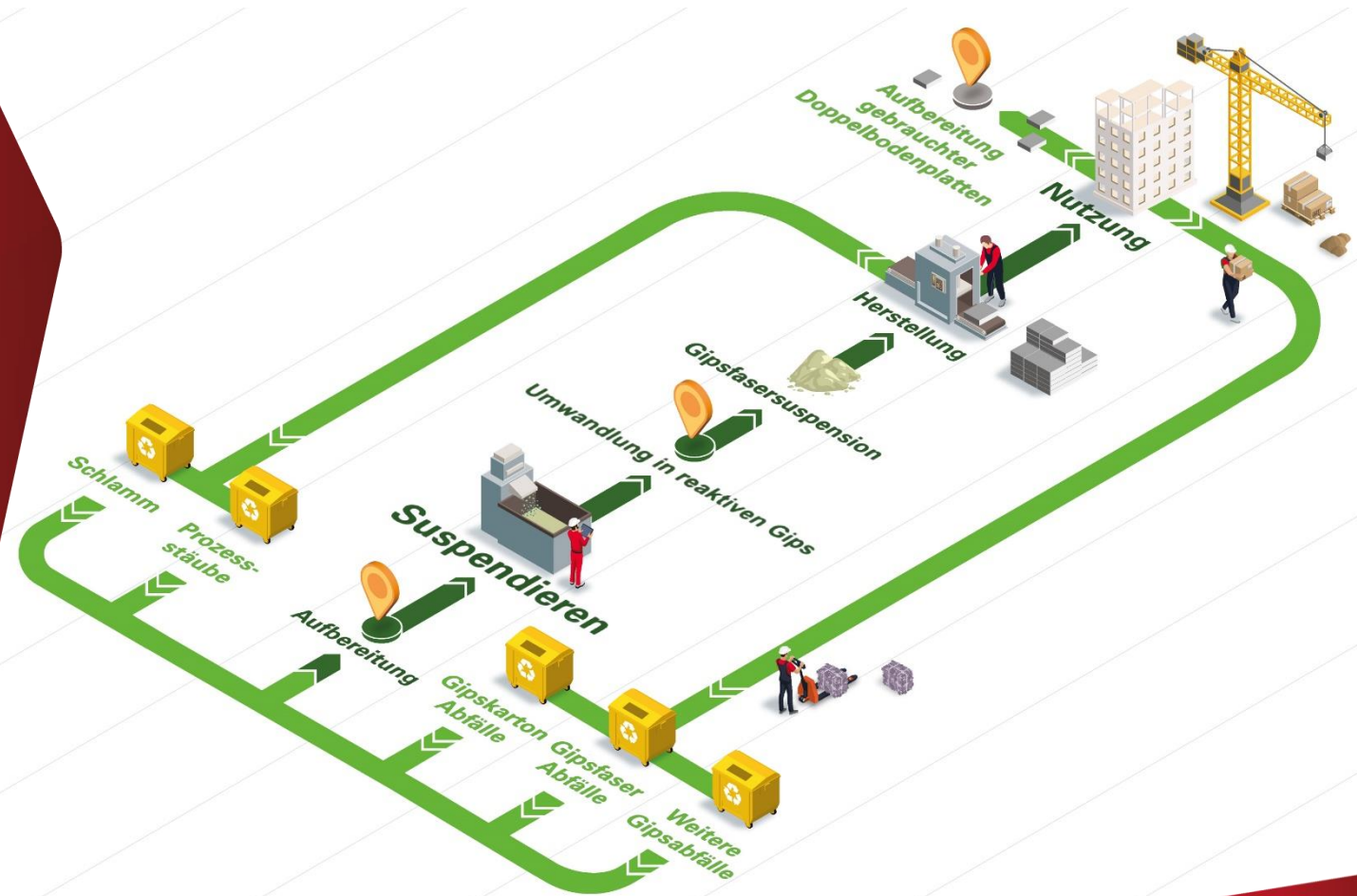


Material reprocessing

of building materials containing gypsum

- In the production process: cuttings, milling dust, sediments
- construction site remains: cuttings/residual materials
- From deconstruction materials: deconstruction waste on the site

- State-supported project (Federal Ministry for the Environment and Nature Conservation))
- Gypsum panels can be processed up to 100% low-energy and thermally reactivated



Patented
method

Material reprocessing

our goals

51,350 tons

of recyclable gypsum are to be returned to the production cycle annually in the future.

44,000 tons

of setting gypsum can be recovered from gypsum waste

5,270 tons of CO₂e

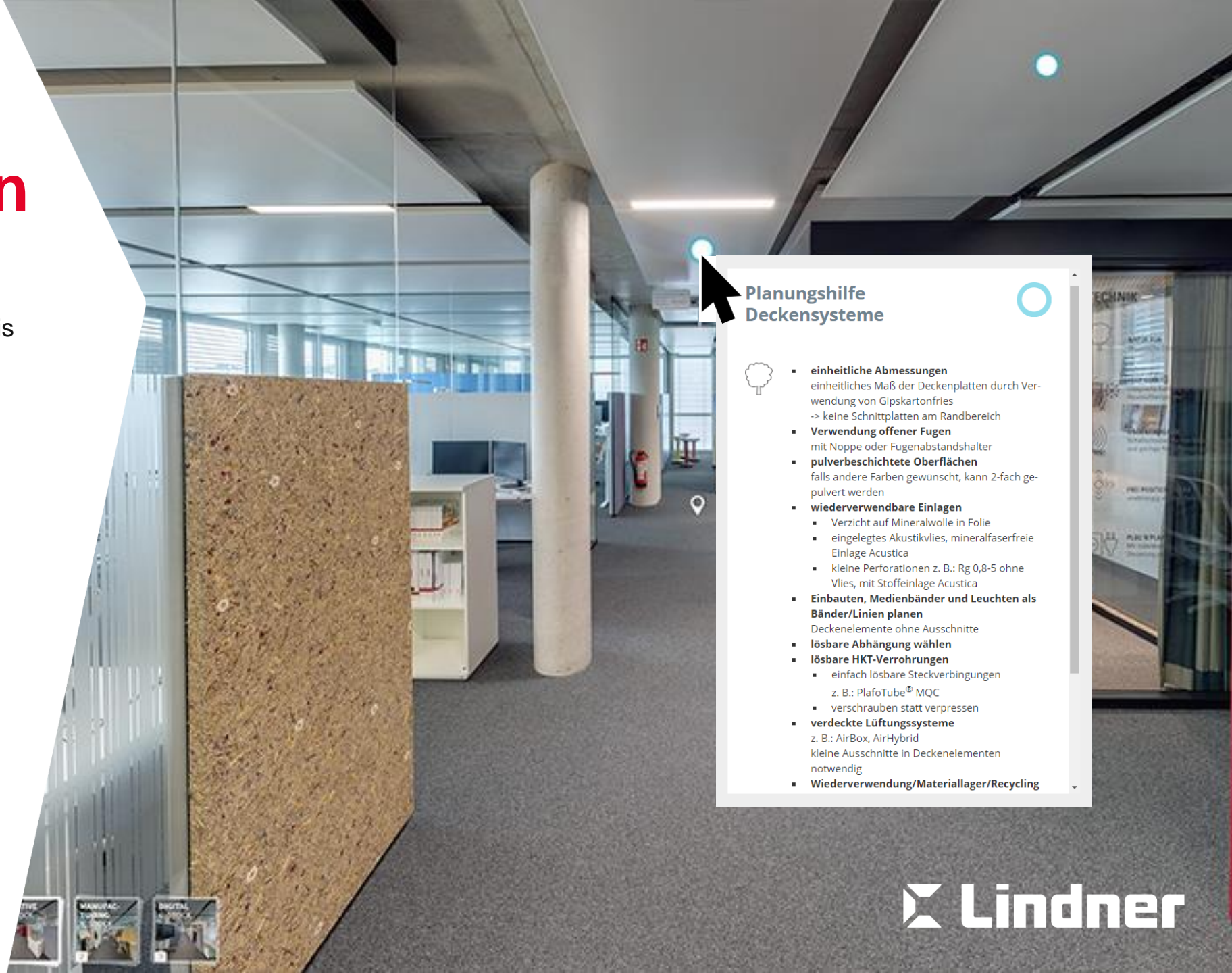
reduction through 53% process energy savings

50,000 tons

Primary raw materials are saved and thus less gypsum waste is deposited in landfills

Circular Product Design

- The modular design of our products is the key for closed loops.
- Our **virtual Showroom** provides further planning aids and product benefits that allow easy reuse and recycling – **take a look into the [360° Tour](#)**



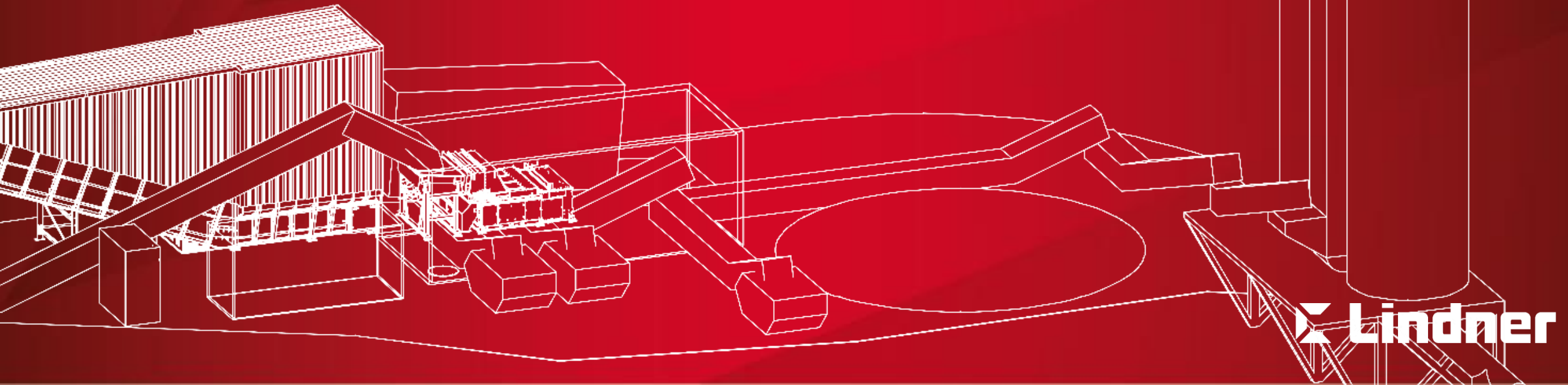
Planungshilfe Deckensysteme



- **einheitliche Abmessungen**
einheitliches Maß der Deckenplatten durch Verwendung von Gipskartonfries
-> keine Schnittplatten am Randbereich
- **Verwendung offener Fugen**
mit Noppe oder Fugenabstandshalter
- **pulverbeschichtete Oberflächen**
falls andere Farben gewünscht, kann 2-fach gepulvert werden
- **wiederverwendbare Einlagen**
 - Verzicht auf Mineralwolle in Folie
 - eingelegtes Akustikvlies, mineralfaserfreie Einlage Acustica
 - kleine Perforationen z. B.: Rg 0,8-5 ohne Vlies, mit Stoffeinlage Acustica
- **Einbauten, Medienbänder und Leuchten als Bänder/Linien planen**
Deckenelemente ohne Ausschnitte
- **lösbare Abhängung wählen**
- **lösbare HKT-Verrohrungen**
 - einfach lösbare Steckverbindungen
z. B.: PlafoTube® MQC
 - verschrauben statt verpressen
- **verdeckte Lüftungssysteme**
z. B.: AirBox, AirHybrid
kleine Ausschnitte in Deckenelementen notwendig
- **Wiederverwendung/Materiallager/Recycling**

Product information and Databases

Strategies and activities at Lindner



Verified sustainability

Product information

Transparent informationen about our products through:

- Self declarations according DIN EN ISO 14021
- Certified Environmental Product Declarations (EPD)
- Proof of emissions (test reports)
- Cradle to Cradle certified® Product standard



Cradle to Cradle Certified®

The System

The concept describes potentially infinite material cycles

„from cradle to cradle“.

Certification is achieved by assessing the following criteria:

- Material health
- Product circularity
- Social fairness
- Water & soil stewardship
- Clean air & climate protection

Certified Lindner Systems:

- 2 Cradle to Cradle Certified® **Gold**
- 4 Cradle to Cradle Certified® **Silver**



Floors

circular | sustainable

Cradle to Cradle Certified® Gold:

- NORTEC aurum
- LOOP aurum

Cradle to Cradle Certified® Silver:

- LOOP prime
- NORTEC | NORTEC power
- FLOOR and more® | FLOOR and more® power | FLOOR and more® arena
- ADDLIFE



 **Lindner**

Partition/Doors

circular | sustainable

Cradle to Cradle Certified® Silber:

- Lindner Life Stereo 125
- Lindner Life Contour 126
- Lindner Life Pure 620
- Life Clear
- ATB 42
- ATB 68
- GTB 10



 **Lindner**

Ceilings

circular | sustainable

Cradle to Cradle Certified® Gold:

Lindner Metal Ceilings aurum

- LMD Post Cap Ceilings
- LMD Hook-On Ceilings
- LMD Corridor Ceilings
- LMD Cassette Ceilings
- LMD Canopy Ceilings
- LMD Baffle Ceilings
- LMD Expanded Metal Ceilings



Cradle to Cradle Certified® Silber:

Plafotherm® Heated and Chilled Ceilings

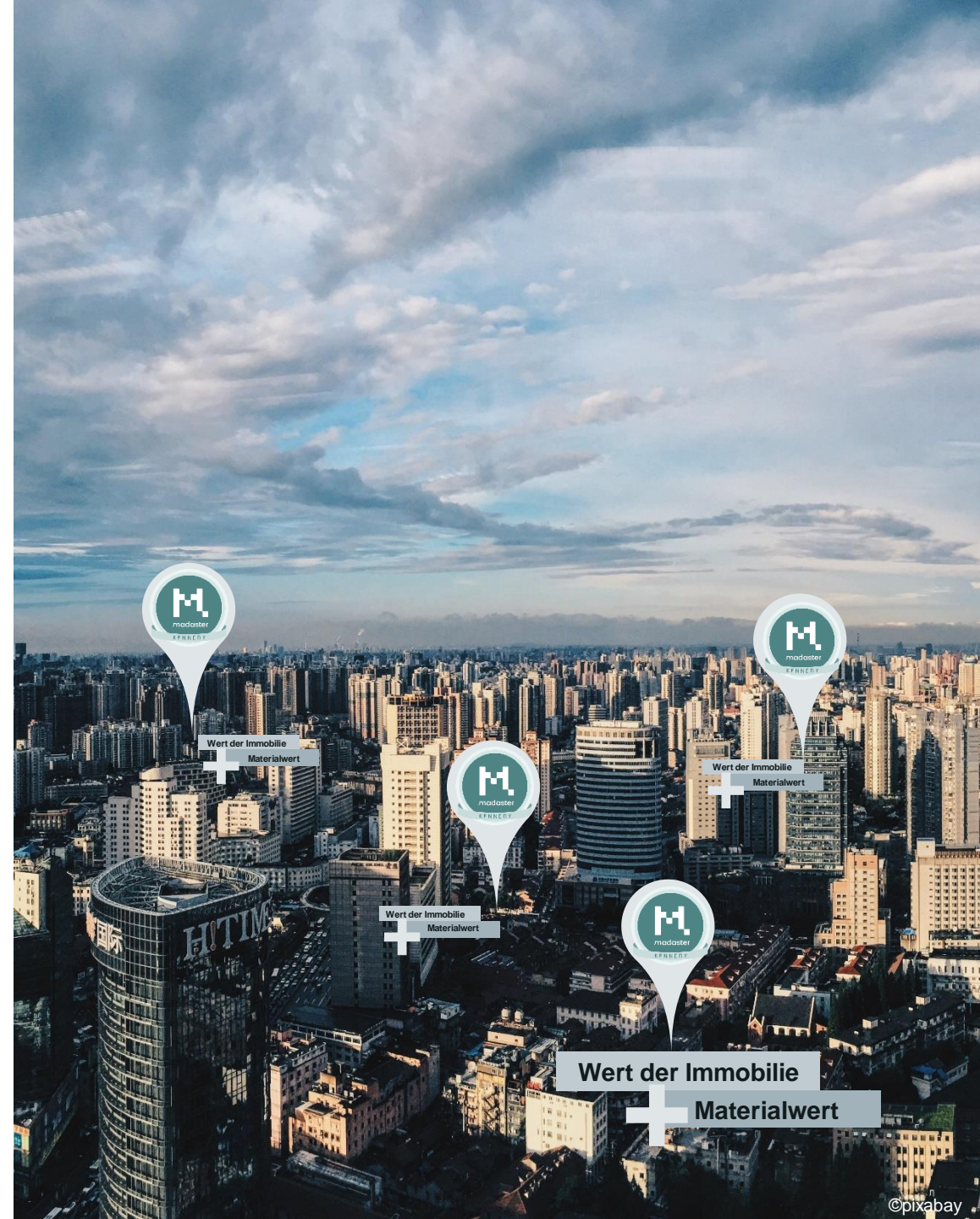
- Plafotherm® Post Cap Ceilings
- Plafotherm® Hook-On Ceilings
- Plafotherm® Corridor Ceilings
- Plafotherm® Canopy Ceilings
- Plafotherm® Baffle Ceilings
- Plafotherm® Hybrid Ceilings
- Plafotherm® Expanded Metal Ceilings



Digital raw material sources

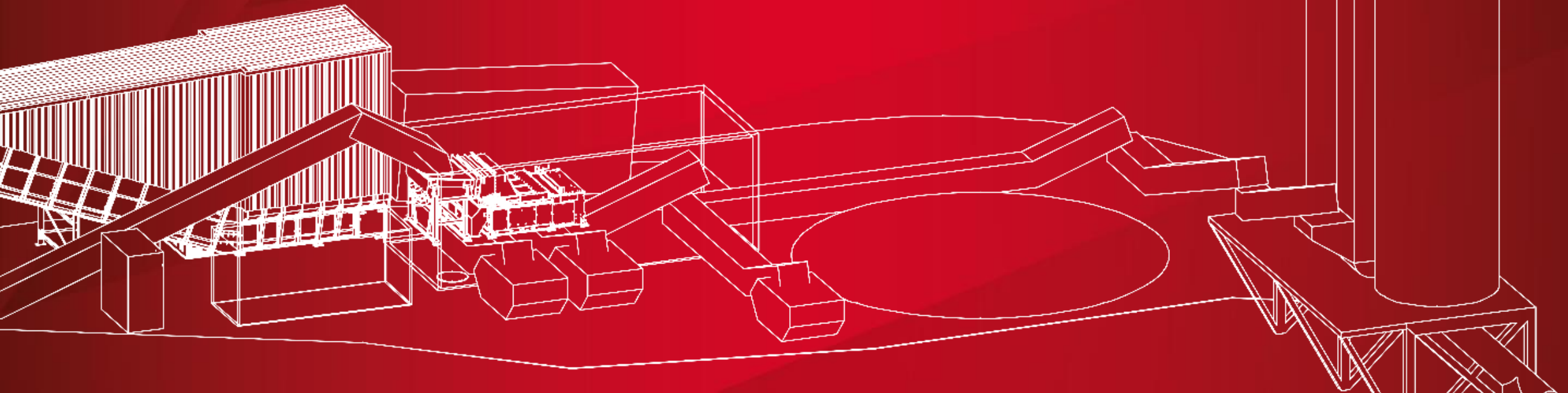
as a basement for material cycles

- Our products can be found in various databases:
- Sustainability information for 26 Lindner product systems is well managed via **Building Material Scout** and can easily be used to provide evidence for „green“ construction projects.
- **Madaster** allows the circular use of products by storing estate and material data and tracking the installation location of material („Track & Trace“)

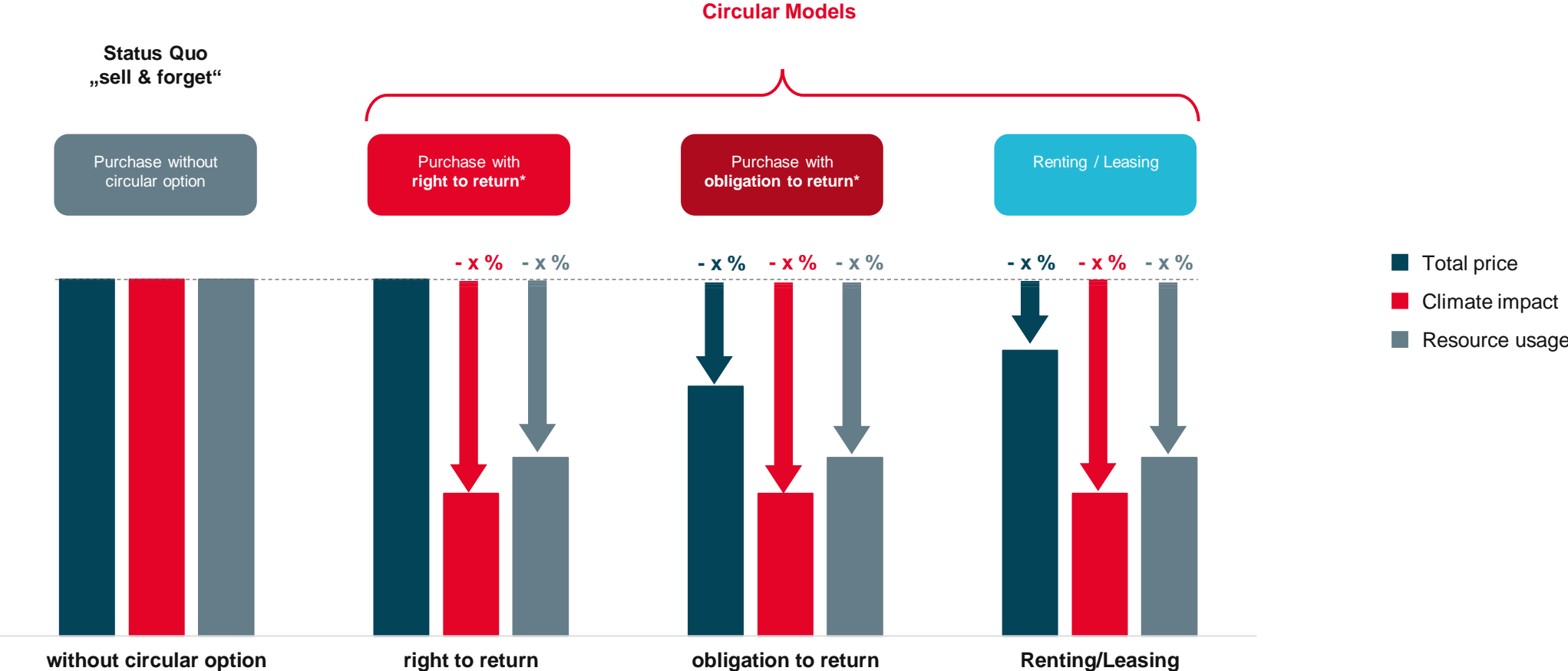


Designing new processes

Circular business models at Lindner



Circular Business Models



* Ecological and economic effects depending on the use of the right of return or choice of exit option.

LinLoop: Purchase and return

Take care – Give back

- Customer pays entire purchase price and is full owner
- Both parties commit in an additional agreement to return or repurchase after 10 - 30 years
- Customer receives the residual value and Lindner bears the dismantling costs
- Annual maintenance contract is possible by request



LinLoop: Renting

Renting is the new buying

- Lease agreement with building owner for 5 - 10 years with monthly rent payment
- Possibility of extension after the expiry of the basic rental agreement
- Rental model includes reversible finishing products including installation, dismantling and an annual inspection
- Notice period is 12 months
- Conversions are possible, adjustment of the rent is made according to expenditure



Product examples

For returning and renting

Ceiling systems

- LMD canopy ceiling and baffle ceilings
- Heating/cooling systems Plafotherm®
- Sound absorber MUTE+

Floors

- Raised floor NORTEC, LOOP prime and LIGNA
- Hollow floor FLOOR and more®

Partition/Doors

- Partition system Glass Life Stereo, Clear und Pure (incl. Glass door)
- Room-in-Room system Lindner Cube



Your add.vantage with LinLoop

- Active contribution to climate and resource protection as well as CO2 savings
- No dismantling and disposal risk
- Improvement in liquidity and equity ratio and shortening of the balance sheet (in the case of the rental model) due to the elimination of advance financing
- For return model Resale proceeds
- Flexibility in term and product
- High quality materials and products that stay in the cycle
- All-round carefree package: consulting, planning, installation and dismantling – all from a single source



How to improve a perfect product?

Reuse it!

Add...

Knowledge / Evidence / Information

- Cradle to Cradle Certified® products program
<https://www.lindner-group.com/en/expertise/green-building/cradle-to-cradle-certifiedr/>
- Building certification
<https://www.lindner-group.com/en/expertise/green-building/building-certification-systems//>
- Product Leasing
<https://www.lindner-group.com/en/expertise/green-building/product-leasing/>
- Environmental Product Declarations
<https://ibu-epd.com/en/published-epds/>
- Self declarations
<https://www.lindner-group.com/en/productfinder/>
- Sustainability
<https://www.lindner-group.com/en/company/sustainability/>
- References
<https://www.lindner-group.com/en/references/>

Further Evidence / Sources:

Cradle to Cradle Certified® ist eine eingetragene Marke des Cradle to Cradle Products Innovation Institute.