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Best Practices

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Best Practices Guide

According to the European Union's Construction and Demolition Waste Management Protocol, construction and demolition waste (C&DW) accounts for approximately one-third of total waste in Europe, making it the largest waste group. In countries such as Poland, where the recycling rate is below 40%, the scale of the problem is further highlighted. Around 30% of the materials brought to a typical construction site end up as waste. However, technological advancements now make it possible to reduce, reuse, recycle and reintroduce these materials back into the economy.

The Best Practices Guide, developed as part of the Zero Waste Build project, aims to contribute to the development of new methodologies by showcasing international examples to inspire stakeholders in the construction sector and related fields. The guide includes short descriptions and links to further information on each best practice. It will serve as a resource to encourage collaboration and the sharing of effective waste management methods between sectors such as architecture, construction, engineering, recycling, logistics, and waste management, as well as local and central governments.

The backbone of this guide is the four-step strategy adopted by the US Environmental Protection Agency (EPA): Reduce, Reuse, Recycle, Rebuy, which will serve as a guiding framework for waste management, the integration of technology across sectors, and the adoption of circular economy approaches.

Visit the Project Website

Visit the e-Learning Platform

Reduce

Best Practices

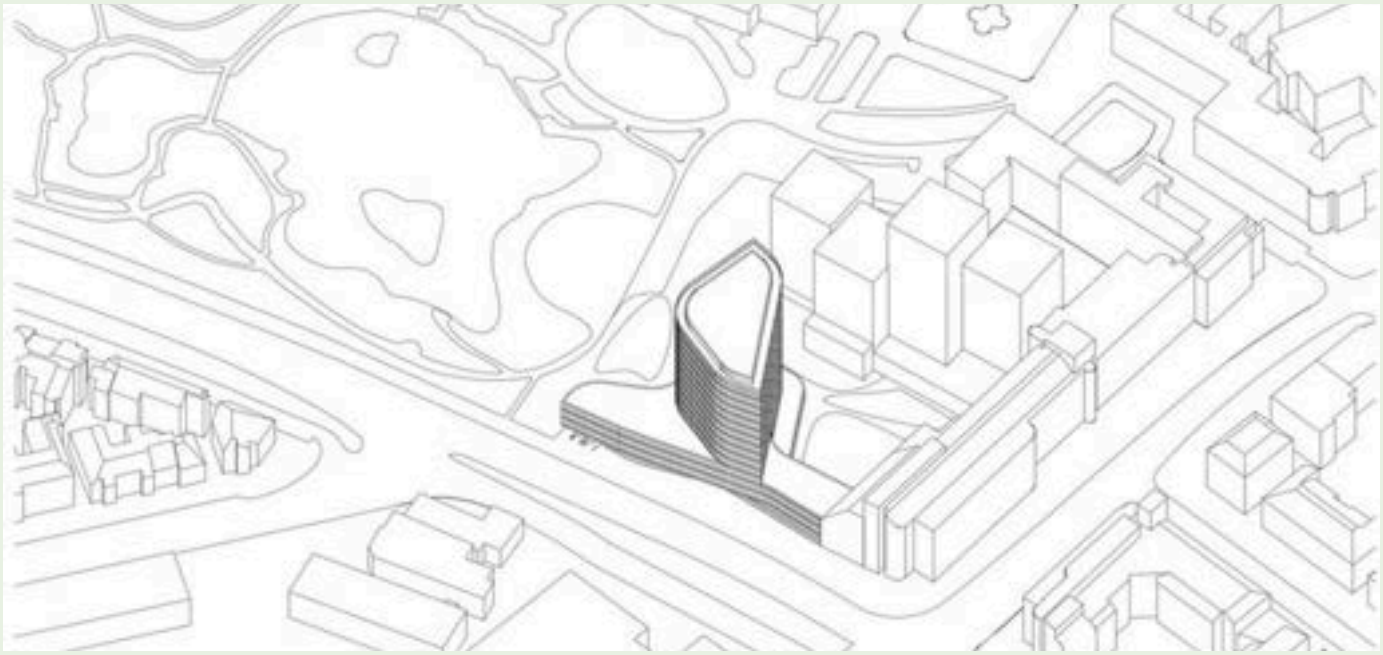
Practice 1

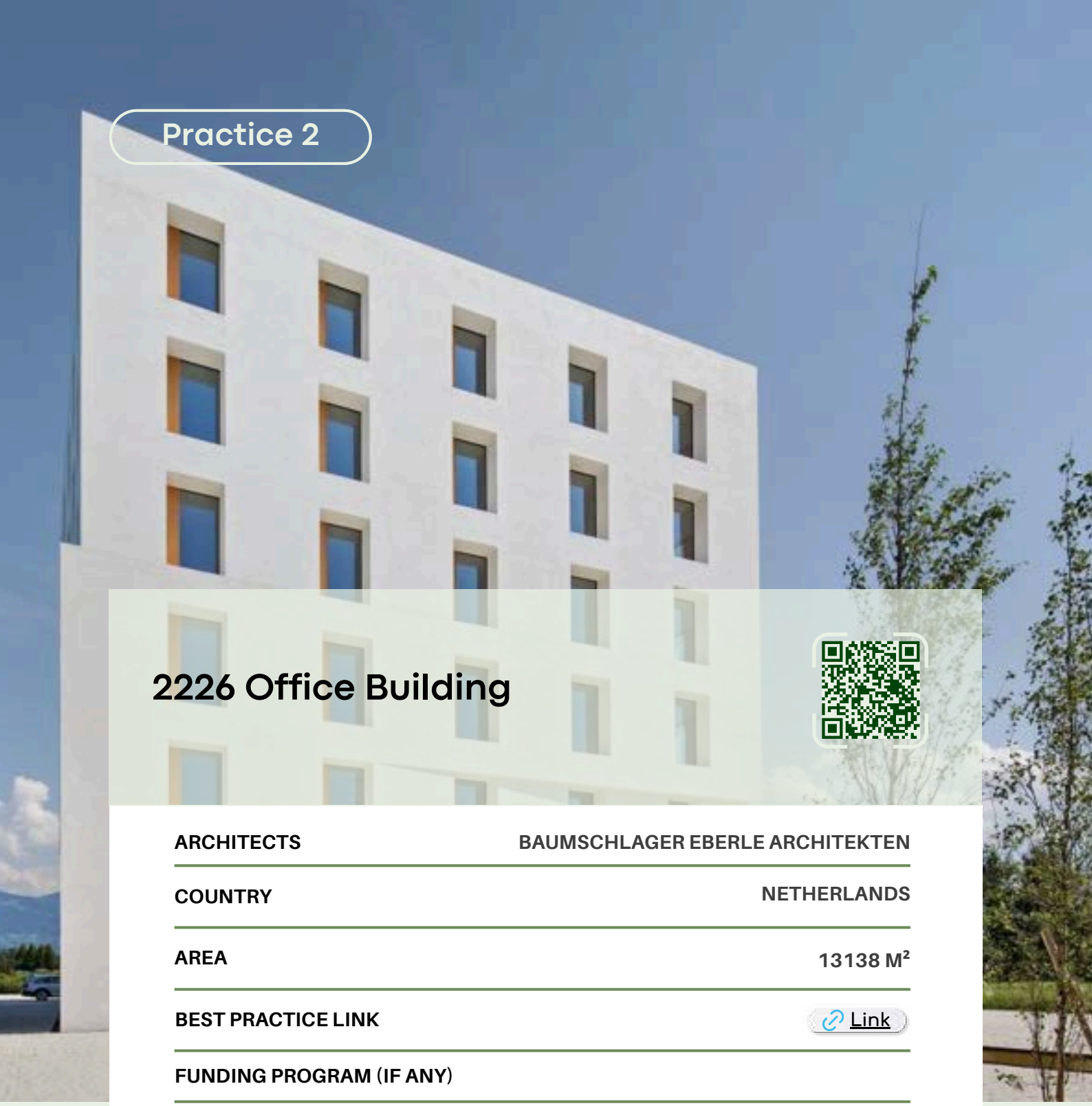
Kfw Westarkade

ARCHITECTS	**SAUERBRUCH HUTTON**
COUNTRY	**GERMANY**
AREA	**39000 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

The 14-storey KfW Westarkade in Frankfurt uses natural ventilation, thermally active concrete, and geothermal energy, cutting office energy use by about 50%. It won the 2011 World's Best High-Rise Award and stands as a symbol of sustainable architecture.





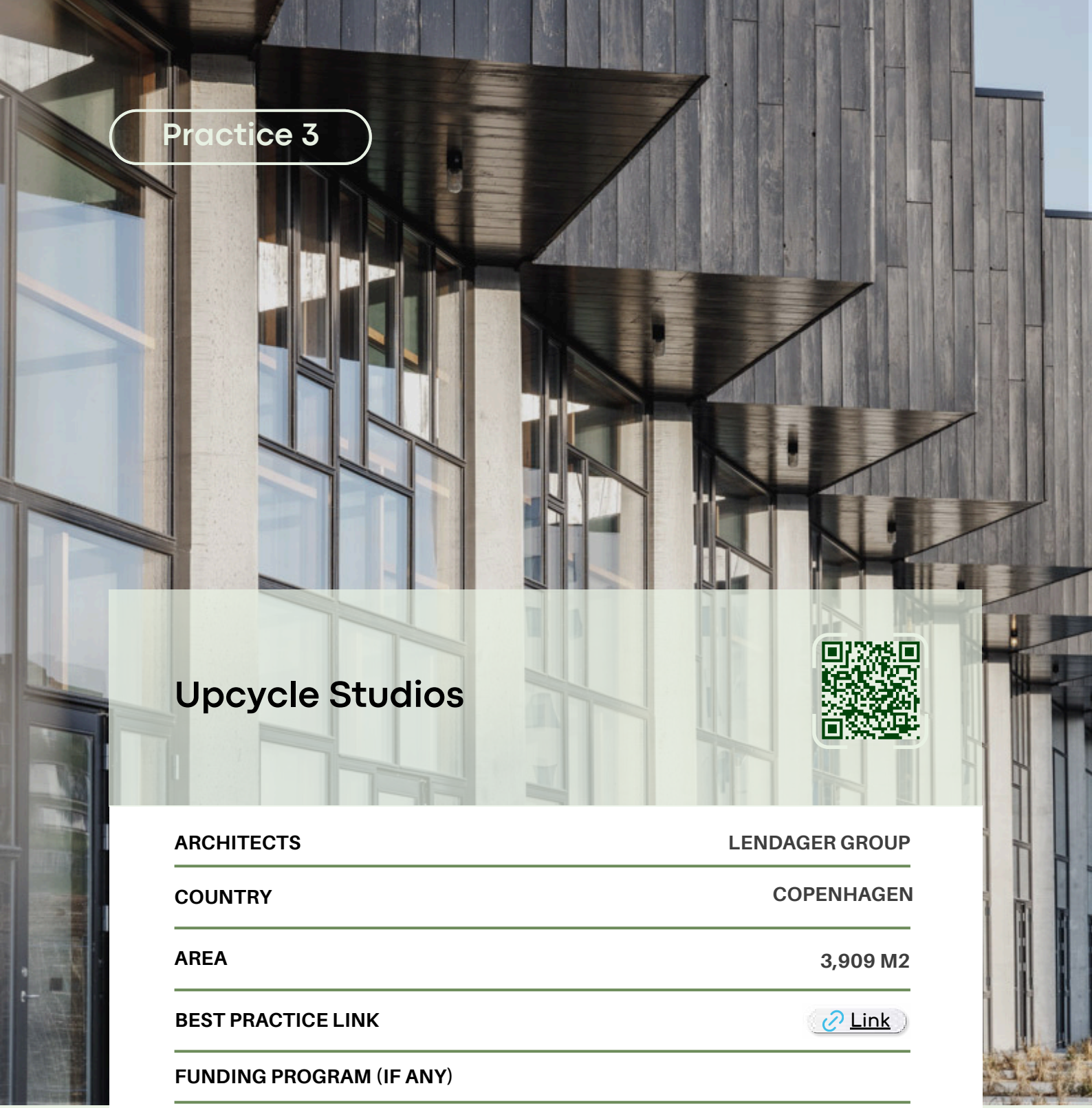
Practice 2

2226 Office Building

ARCHITECTS	**BAUMSCHLAGER EBERLE ARCHITEKTEN**
COUNTRY	**NETHERLANDS**
AREA	**13138 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

The '2226' office building maintains a year-round indoor temperature of 22–26 °C without traditional HVAC systems. Its thick insulated brick walls, high ceilings, and automated windows allow occupant and equipment heat to suffice. This passive design cuts heating energy use by about 80% compared to similar offices.



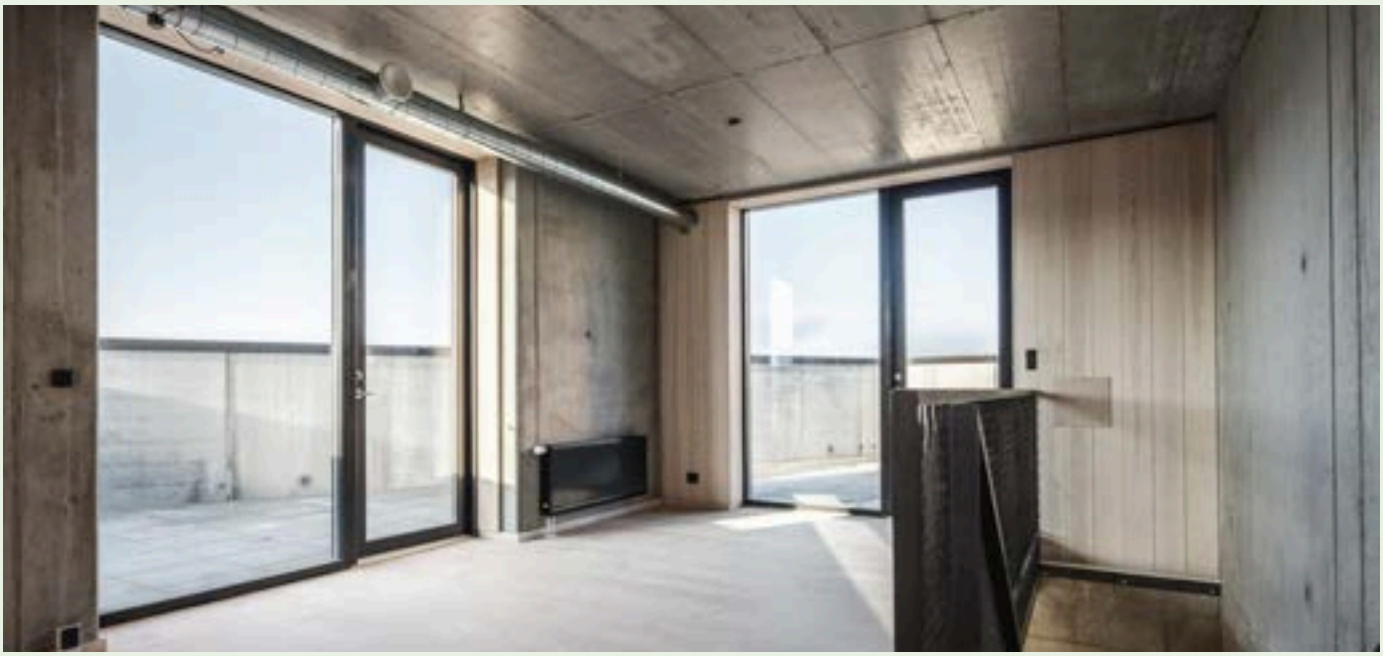
Practice 3

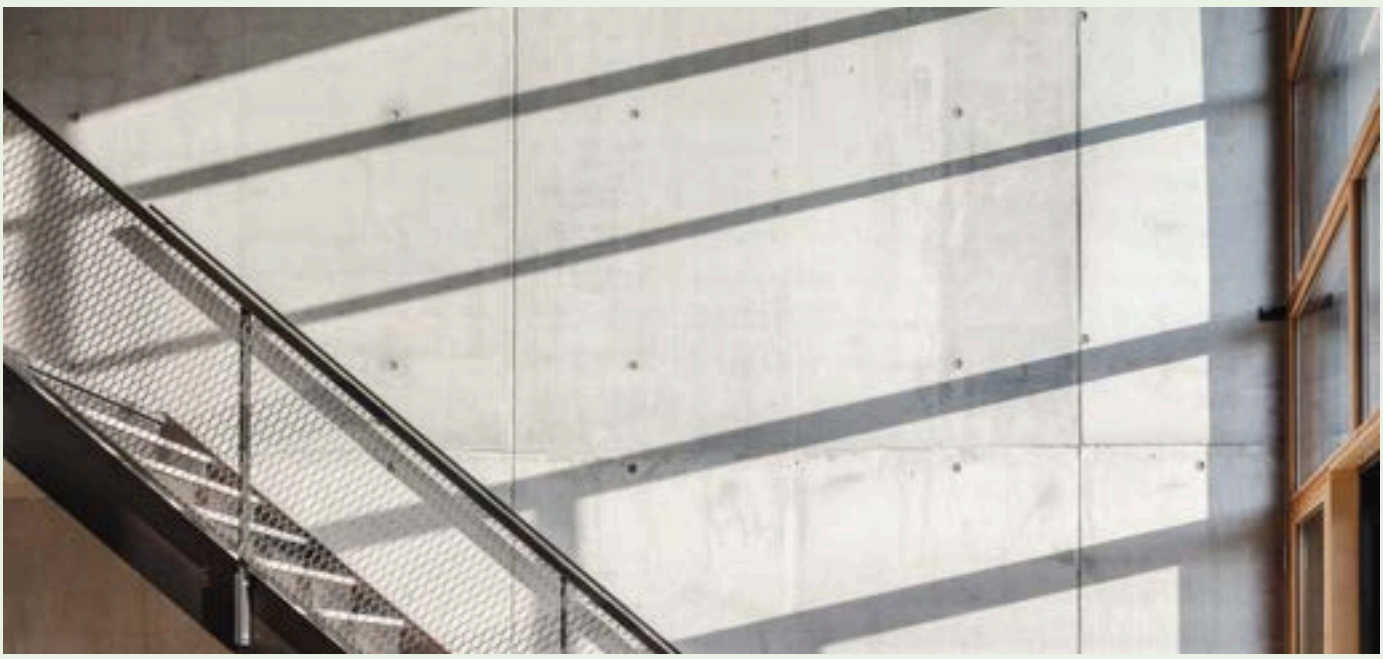
Upcycle Studios

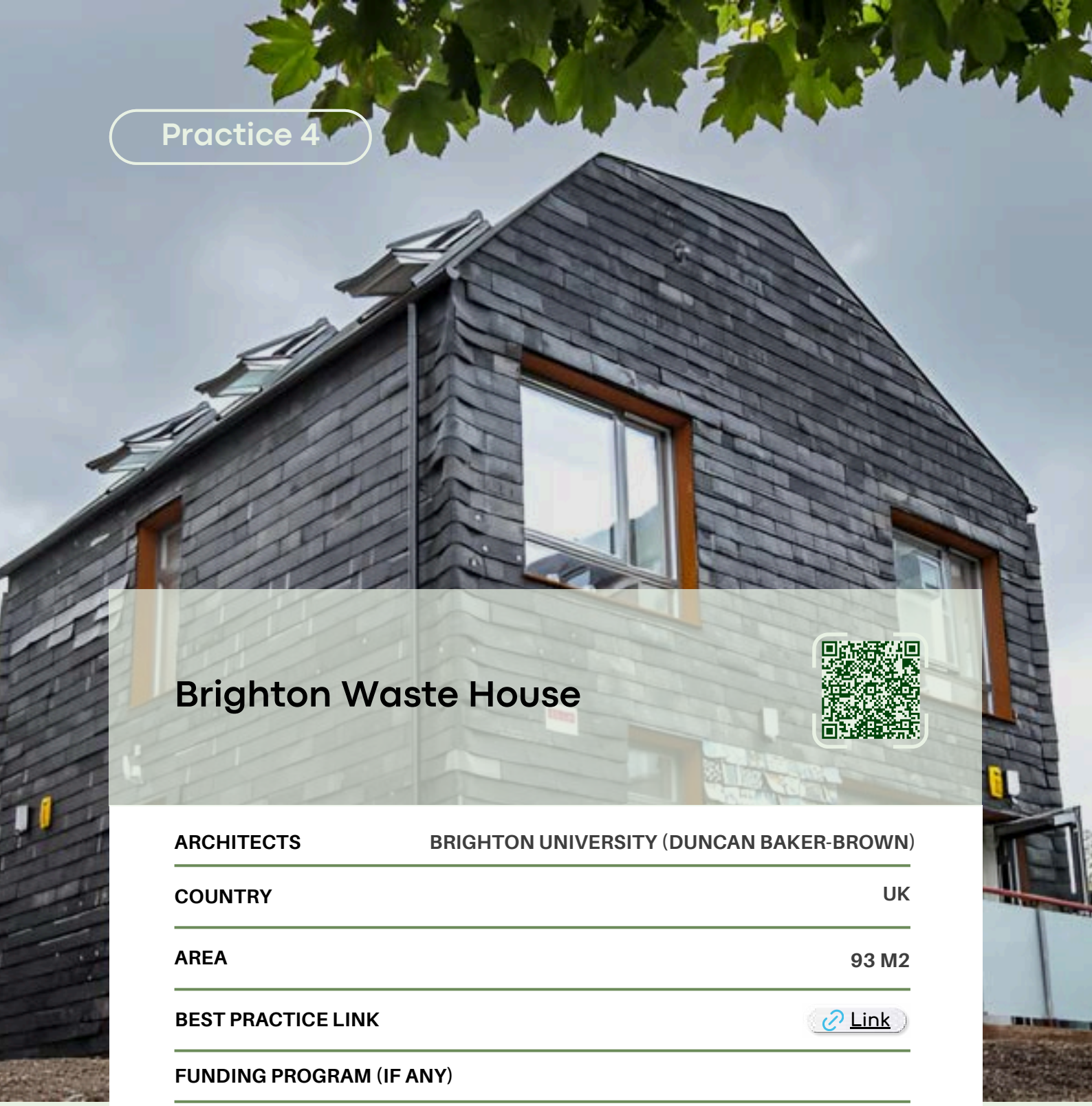
ARCHITECTS	**LENDAGER GROUP**
COUNTRY	**COPENHAGEN**
AREA	**3,909 M2**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

Upcycle Studios in Copenhagen comprises 20 terraced houses built almost entirely from recycled materials. Demolition concrete, old double-glazed windows and reclaimed wooden flooring form the main structure, repurposing some 1,000 tonnes of waste. This circular approach cut carbon emissions by 45% and significantly reduced the need for new concrete, steel and other resources—demonstrating that sustainability and quality can go hand in hand.







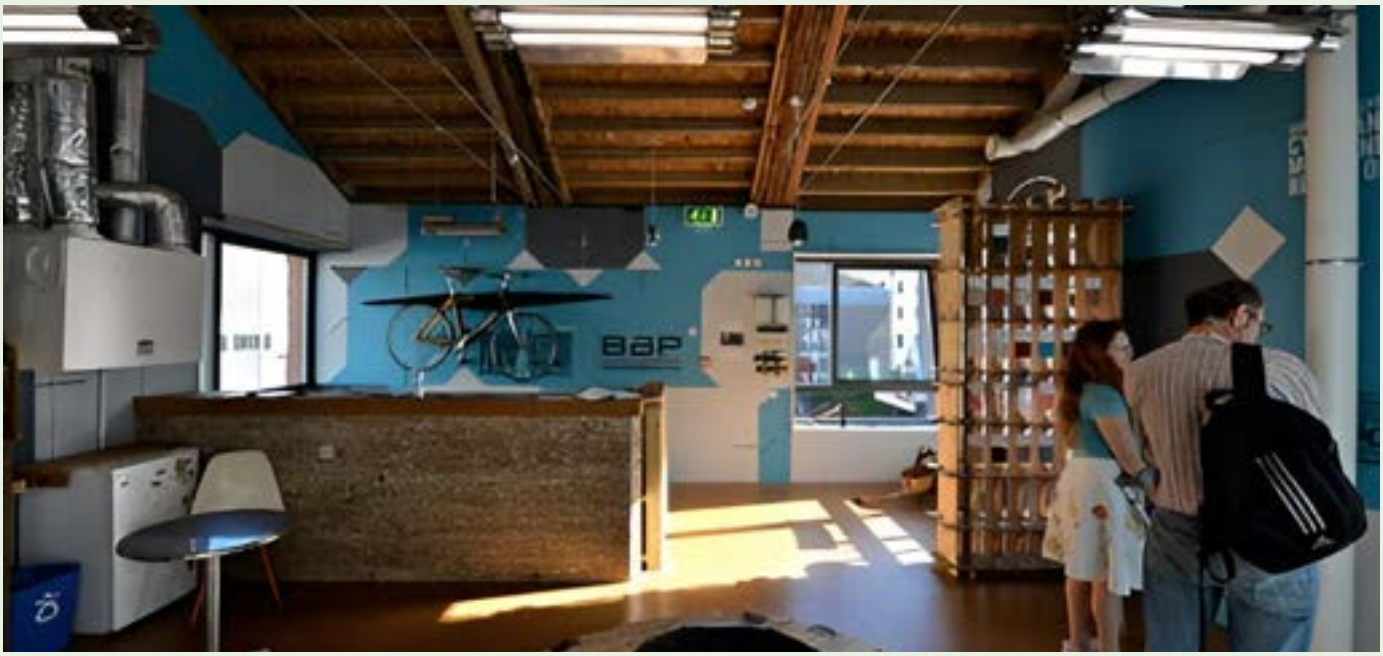
Practice 4

Brighton Waste House

ARCHITECTS	**BRIGHTON UNIVERSITY (DUNCAN BAKER-BROWN)**
COUNTRY	**UK**
AREA	**93 M2**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

The Waste House in Brighton is the UK's first permanent building made almost entirely from waste—from toothbrushes and jeans to demolition debris. Over 85% of its materials were reused rather than newly sourced, showcasing sustainable design and raising awareness of circular construction.


BAP


RATIONING'S
FINE BUT
RECYCLING'S
SUBLIME.
RE-USE.


WASTE

Practice 5

Alliander HQ

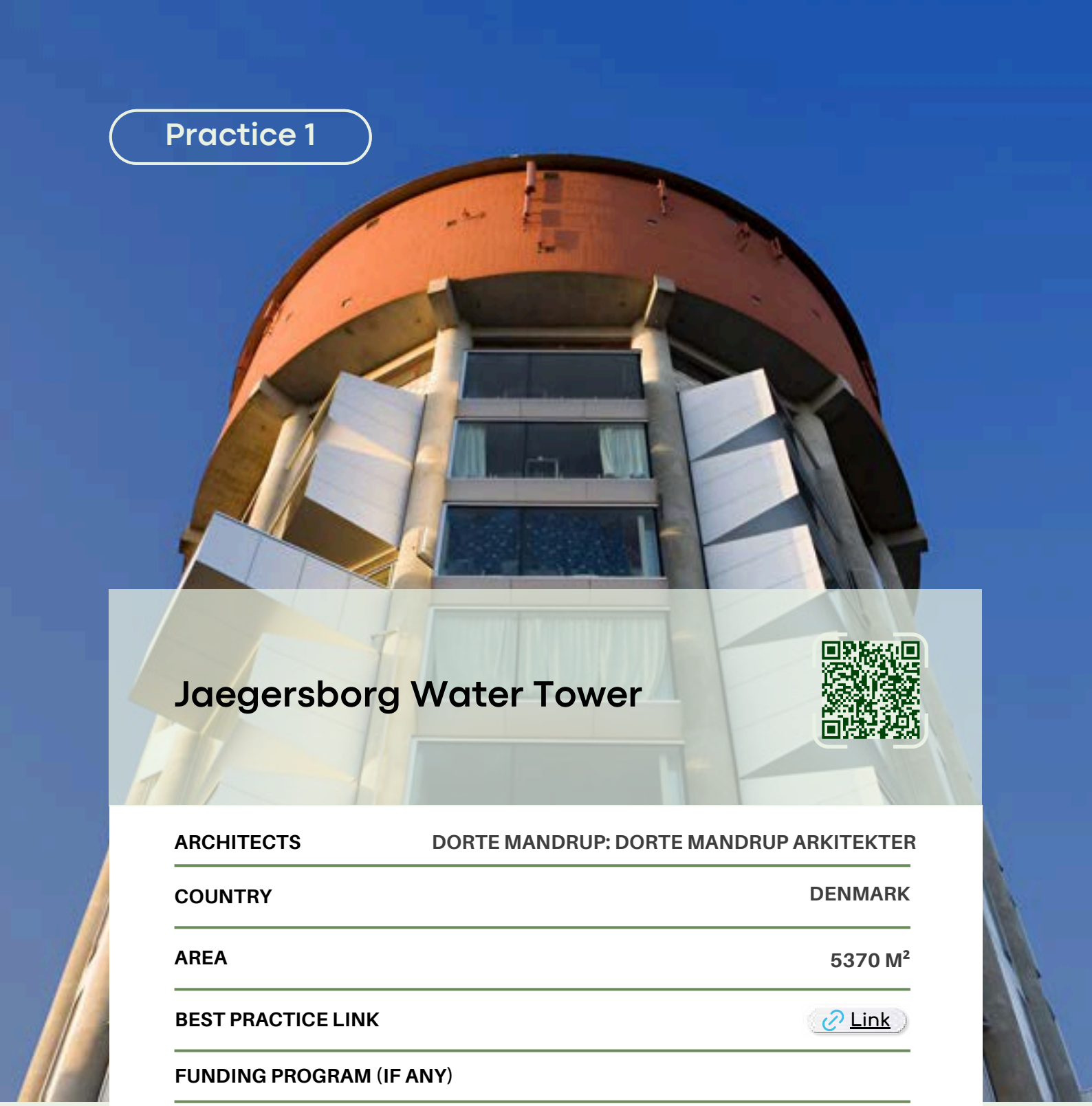
ARCHITECTS	**RAU**
COUNTRY	**THE NETHERLANDS**
AREA	**21852 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

Alliander's Duiven office campus was sustainably renovated under circular-economy principles by retaining six blocks and linking them with a new atrium. Roughly 80% of materials—ceiling panels, doors, plumbing fixtures—were reused on-site or repurposed elsewhere, cutting waste and curbing new resource use. The project achieved BREEAM Outstanding certification.

Reuse
Best Practices

Practice 1

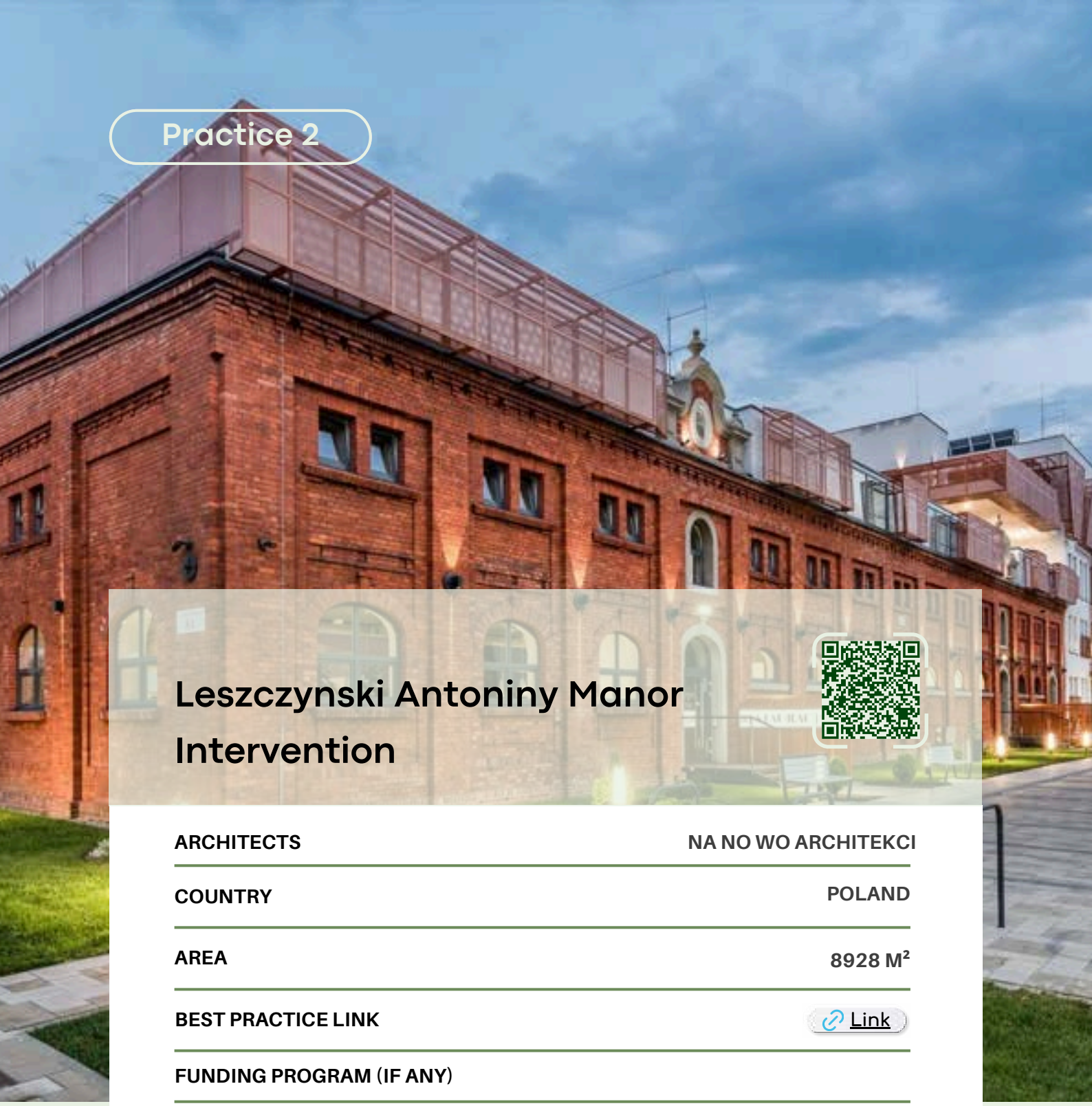


Jaegersborg Water Tower

ARCHITECTS	**DORTE MANDRUP: DORTE MANDRUP ARKITEKTER**
COUNTRY	**DENMARK**
AREA	**5370 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

Dorte Mandrup Arkitekter ApS converted the Jægersborg Water Tower into mixed-use student housing and a youth centre. Crystal-like extensions at the top flood individual apartments with light and panoramic views, while communal balconies soften the tower's silhouette. Below, the youth centre's multipurpose rooms, vibrant panels and tall windows open via garage-style doors onto the outdoor playground, blending indoor and outdoor space.



Practice 2

Leszczynski Antoniny Manor Intervention

ARCHITECTS	**NA NO WO ARCHITEKCI**
COUNTRY	**POLAND**
AREA	**8928 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

NA NO WO Architekci has transformed Leszczyński Antoniny Manor into an 8,928 m² eldercare and residential complex by restoring 19th- and 20th-century buildings and adding a new wing. The site now features a rehabilitation centre, restaurant, chapel, hotel rooms and green terraces—plus a basement beneath the former stables. Cor-Ten-inspired accents tie old and new together, while full accessibility and modern upgrades foster a welcoming community for seniors.

Practice 3

Professional Cooking School in Ancient Slaughterhouse

ARCHITECTS	**SOL89**
COUNTRY	**SPAIN**
AREA	**751 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

Sol89 converted a 19th-century slaughterhouse in Medina Sidonia into a cooking school, retaining its whitewashed walls, stone and brickwork, and Phoenician columns under a unifying ceramic roof. The original courtyard layout persists alongside new patios for ventilation and herb gardens, while concrete slabs with wooden formwork reinterpret local building methods to blend history and modern function.

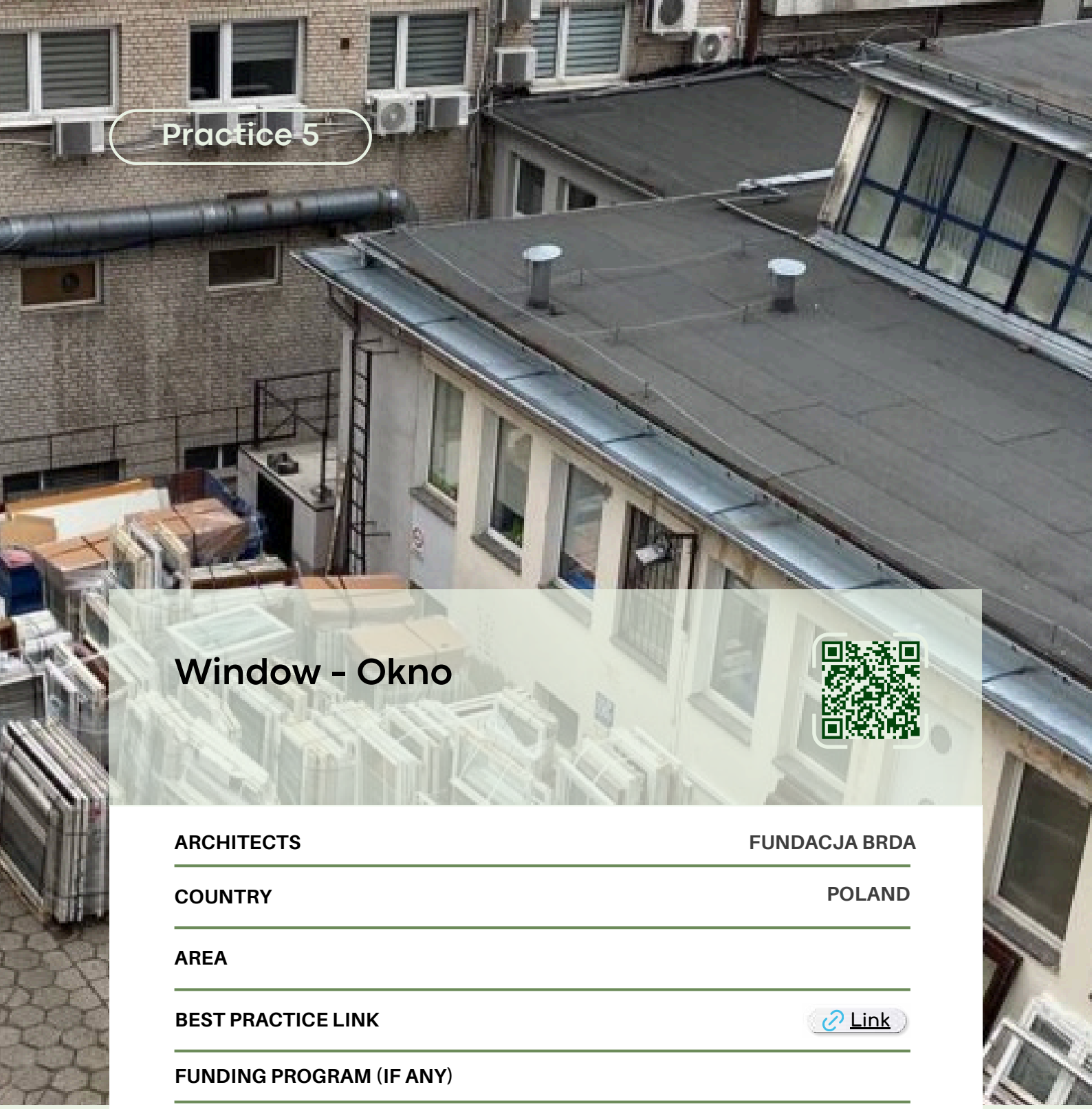
Practice 4

Consorzio Agrario Adaptive Reuse into Aparto Ripamonti

ARCHITECTS	**PARK ASSOCIATI**
COUNTRY	**ITALY**
AREA	**32000 M²**
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

Description

Park Associati transformed a 1940s consortium on Milan's Via Ripamonti into student housing, restoring its grey-plaster and sandstone façade and adding a modern rooftop and glass-metal extension. The complex now houses over 700 students across apartments, study and social areas—including a courtyard, cinema, music rooms and rooftop basketball court.



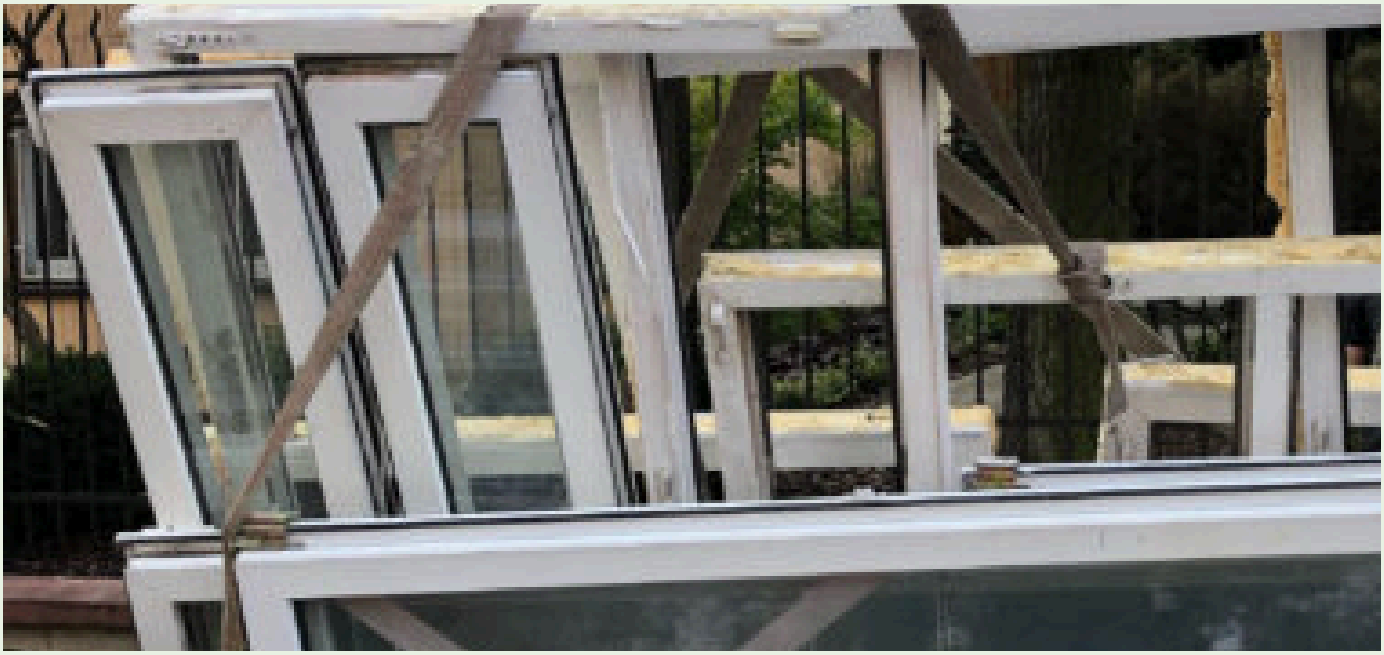
Practice 5

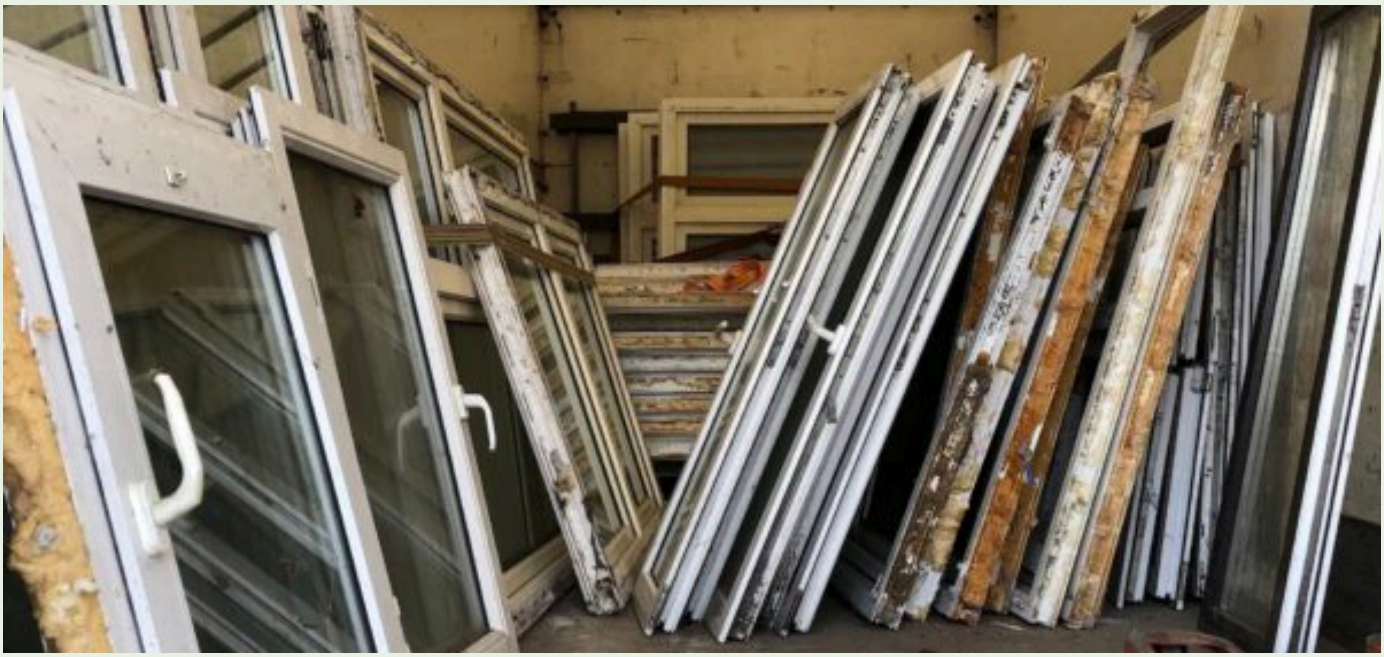
Window - Okno

ARCHITECTS	**FUNDACJA BRDA**
COUNTRY	**POLAND**
AREA	
BEST PRACTICE LINK	Link
FUNDING PROGRAM (IF ANY)	

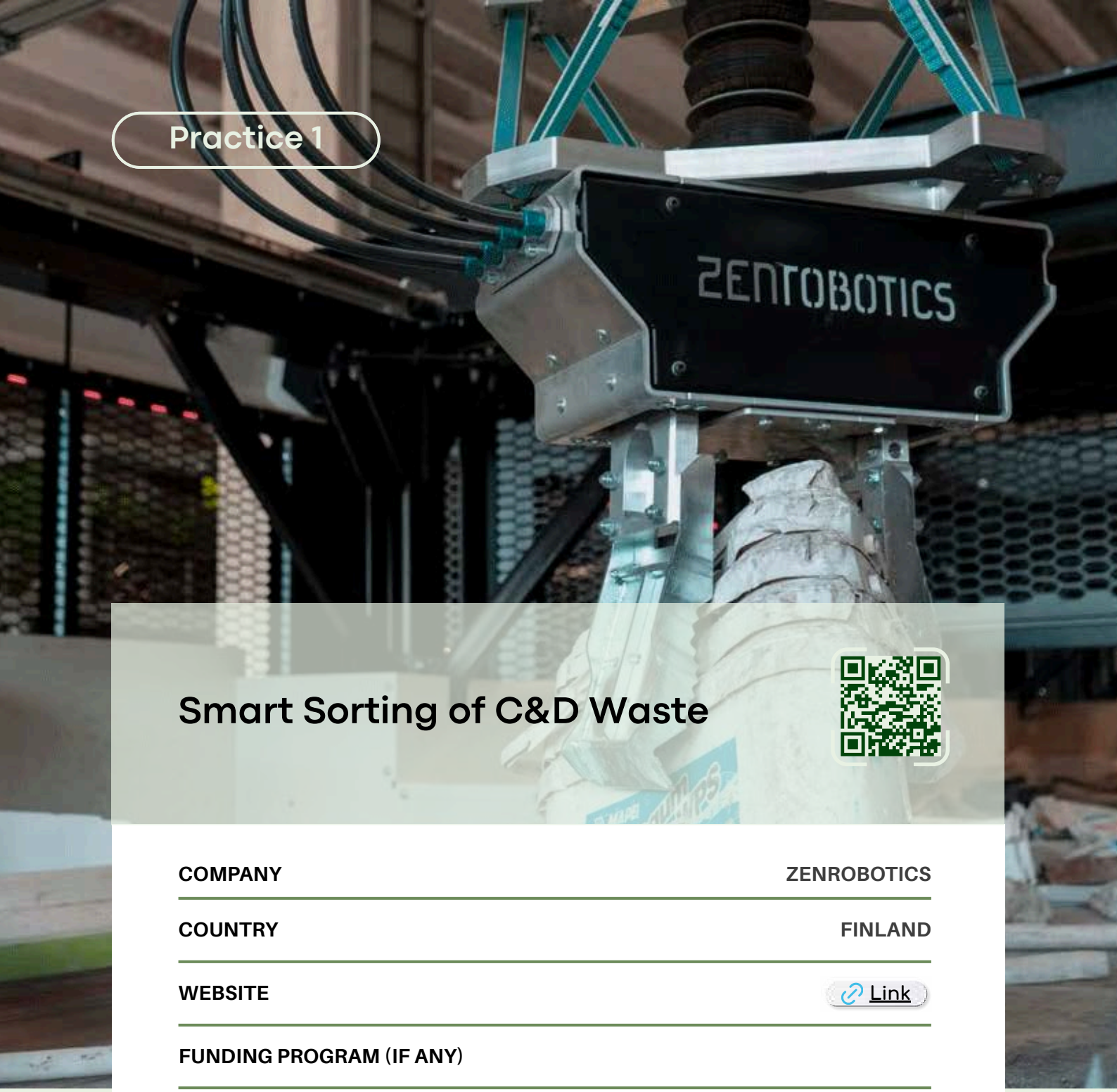
Description

Launched by the BRDA Foundation in Kyiv in July 2022, the WINDOW project salvages windows from demolitions and renovations and—via partners Unity and Strength, Svoi Lydu and Dom Odbudowy Ukrainy—delivers them to NGOs rebuilding homes in Kyiv, Kherson and Chernihiv. Embracing circular-economy principles, it turns discarded materials into vital insulation and protection—and welcomes further donations and partnerships.





Recycling
Best Practices



Practice 1

Smart Sorting of C&D Waste

COMPANY	**ZENROBOTICS**
COUNTRY	**FINLAND**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

ZenRobotics uses AI and robotic arms to sort construction and demolition waste into reusable materials like wood, metal, and concrete with high efficiency. This technology reduces manual labor and waste sent to landfills.


ZETROBOTICS


METALS
WOOD

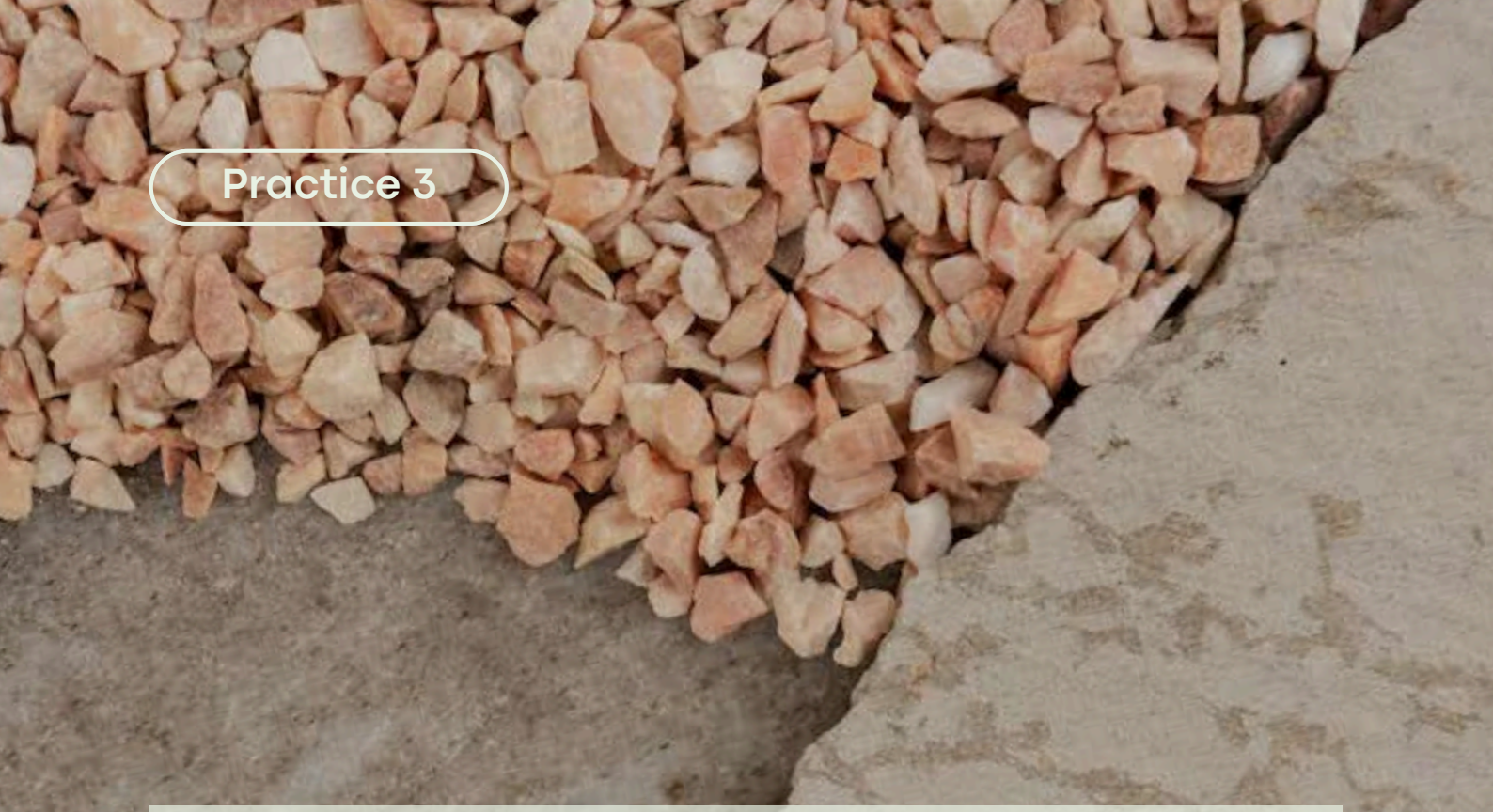
Practice 2

Concrete Recycling Using Smart Crushers

COMPANY	**SMARTCRUSHER BV**
COUNTRY	**NETHERLANDS**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	**NETHERLANDS**

Description

SmartCrusher BV has developed a technology that separates the unhydrated cement and sand from demolished concrete, enabling the materials to be reused in new construction projects.



Practice 3

Recycled Aggregates in Construction

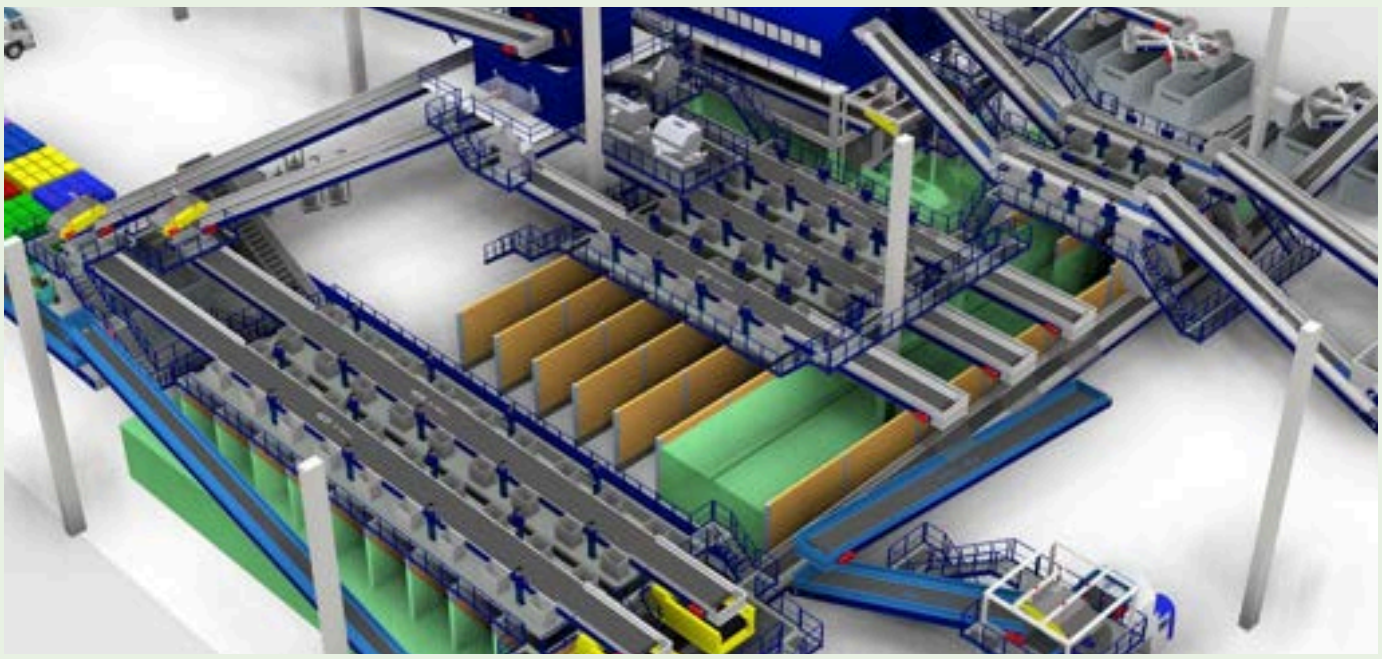
COMPANY	**STADLER AND ZENROBOTICS**
COUNTRY	**FINLAND**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

In collaboration with Remeo Oy, STADLER and ZenRobotics have built a pioneering Materials Recovery Facility that integrates AI-based robotic sorting technologies. This facility processes both Commercial & Industrial (C&I) and Construction & Demolition (C&D) waste, achieving high levels of automation and material recovery.


STADLER


w-stadler.de
STADLER
STADLER



Practice 4

Gypsum Recycling from Construction Waste

COMPANY	**GYPSUM RECYCLING FROM CONSTRUCTION WASTE**
COUNTRY	**DENMARK**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

Gypsum Recycling International (GRI) recycles gypsum and plasterboard waste into reusable raw materials, supporting a circular economy. From 2013 to 2015, GRI joined the EU-funded Gypsum to Gypsum (GtoG) project, led by Eurogypsum and co-financed by Life+. Involving 17 partners, the project aimed to boost gypsum recycling and promote resource efficiency.

Practice 5

Green Operations in Construction Material Production

COMPANY	**HOLCIM**
COUNTRY	**FRANCE**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

Holcim is at the forefront of decarbonizing construction through green operations. They implement advanced technologies such as carbon capture, utilization, and storage (CCUS), and focus on reducing CO_2 emissions in their production processes, contributing to sustainable construction practices.


ECOPact
Concreto Verde

Rebuying

Best Practices

Practice 1

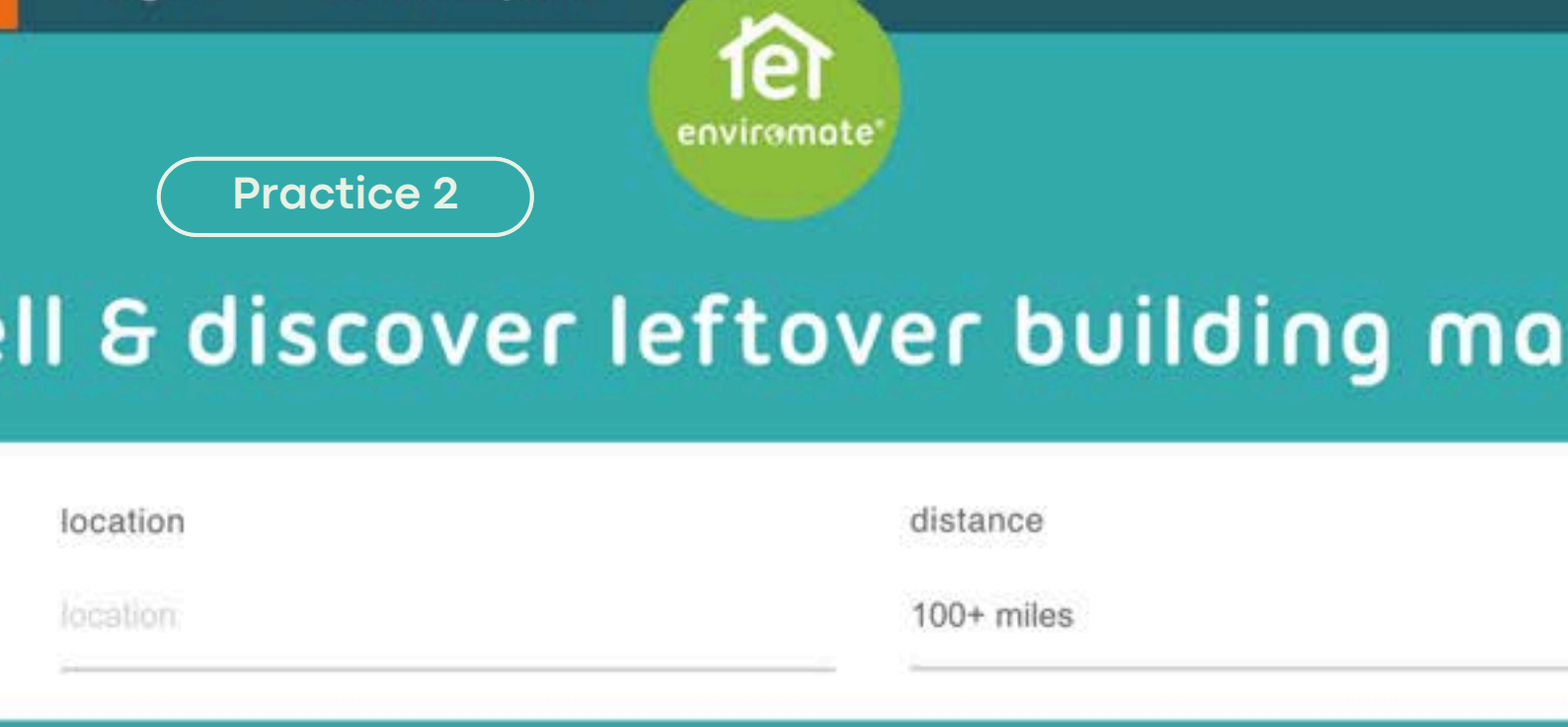
Rebuying Recycled Concrete Products

COMPANY	**HEIDELBERG MATERIALS**
COUNTRY	**GERMANY**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

Heidelberg Materials markets concrete products containing recycled aggregates derived from construction waste. These products maintain high structural integrity while reducing environmental impacts and conserving natural resources.

Practice 2



Online Marketplace for Recycled Building Materials

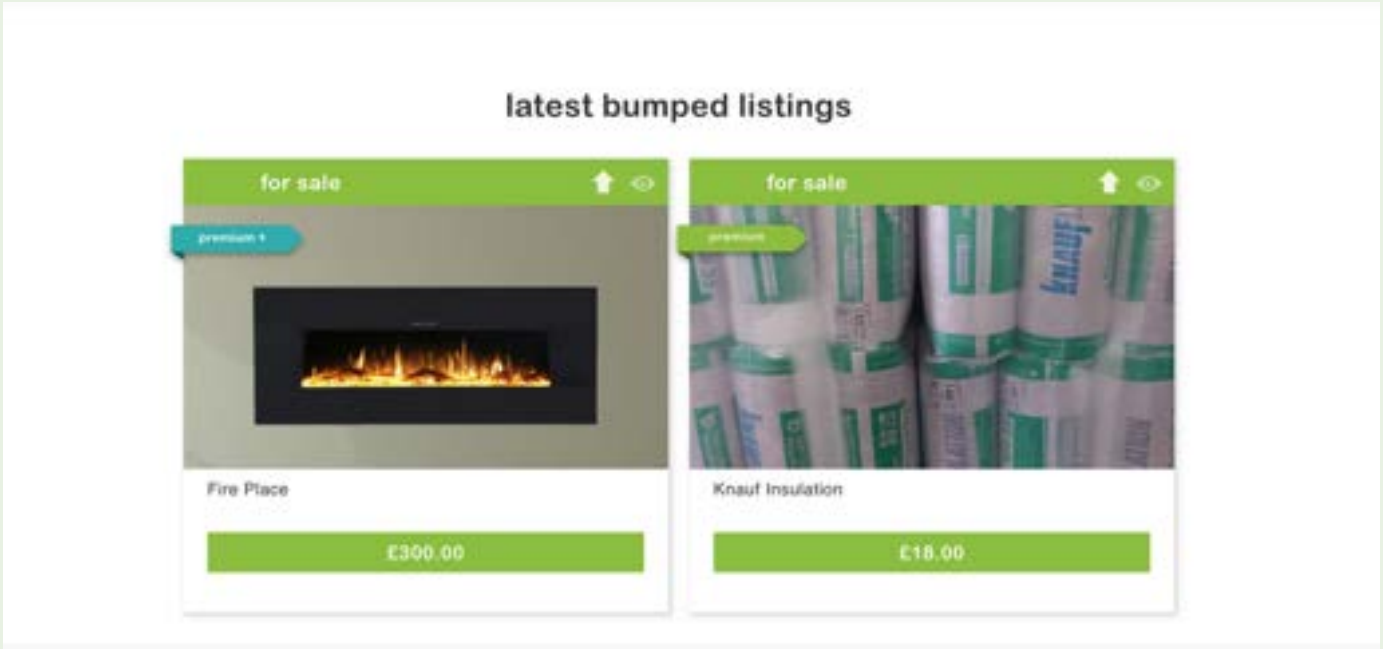
COMPANY	**ENVIRONMATE**
COUNTRY	**UK**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

Enviromate operates an online platform connecting construction companies to buy and sell surplus or recycled building materials. This marketplace reduces waste and promotes the reuse of materials in construction projects.


create an account
sign in
the marketplace
buy, sell & discover leftover building materials
keyword
location
distance
100+ miles
search
Building
Plumbing
Carpentry
Electrical
Painting & Decorating
Tools
Free
Other
Wholesalers
as featured in
BBC NEWS
THE HUFFINGTON POST
theguardian
TheObserver Ethical Awards


BE PART OF THE SOLUTION
420 MILLION TONNES of products and materials are consumed per annum by the UK construction industry
32%
OF ALL UK
LANDFILL
13%
NEW or
NEVER
USED


latest bumped listings
for sale
Fire Place
£300.00
for sale
Knauf Insulation
£18.00

Practice 3

Reclaimed Construction Materials for Reuse

COMPANY	**ROTOR DECONSTRUCTION**
COUNTRY	**BELGIUM**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

Rotor Deconstruction specializes in the deconstruction and reclamation of building components. They carefully dismantle, clean, and prepare materials such as doors, windows, and tiles for resale, facilitating their integration into new construction projects and promoting sustainable building practices.

Practice 4

Reclaimed Wood Utilization in Construction

COMPANY	**RE4 (HORIZON 2020)**
COUNTRY	**EUROPEAN UNION**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

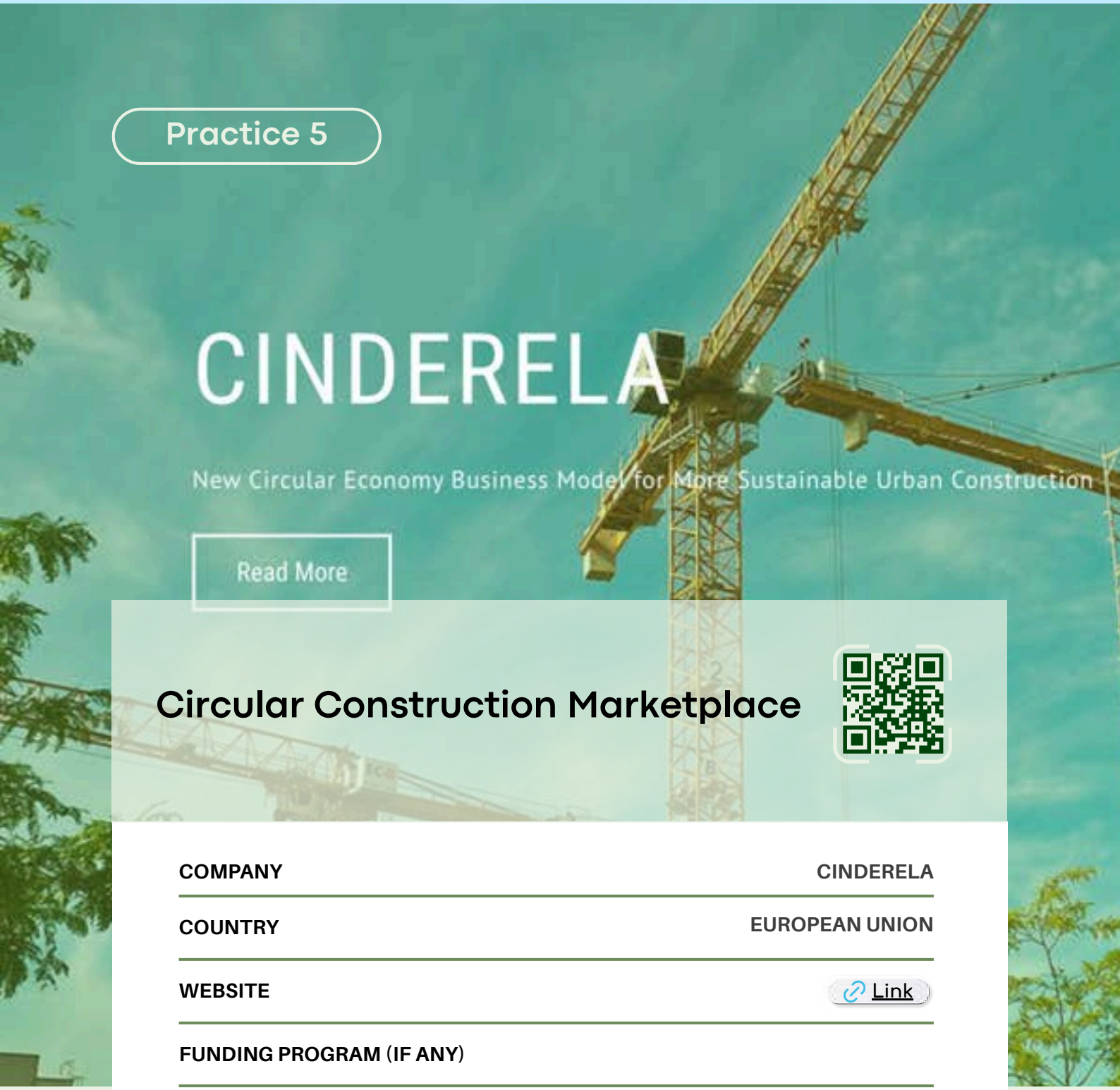
RE4 project, funded under the EU's Horizon 2020 program, focuses on the development of prefabricated energy-efficient building components using recycled materials from construction and demolition waste. A significant aspect of the project is the reclamation and reuse of wood elements. By processing reclaimed wood, the project creates new construction materials, promoting the rebuying of recycled products and contributing to a circular economy in the building sector.


REUSABLE MATERIALS
CDW
ROOF TILES
TIMBER BEAMS
BRICK WORK
SOIL


ACCIONA, ES
STRESS, IT
CREAGH, UK
High replication outside EU through demo in Taiwan


SORTING SYSTEM
CLAY/SILT
WOOD FIBREs
TIMBER FLAKES
BRICKS & TILES
CRUSHED PLASTICS
AGGREGATES
An innovative sorting system based on attrition density separation and automated robotics

Practice 5



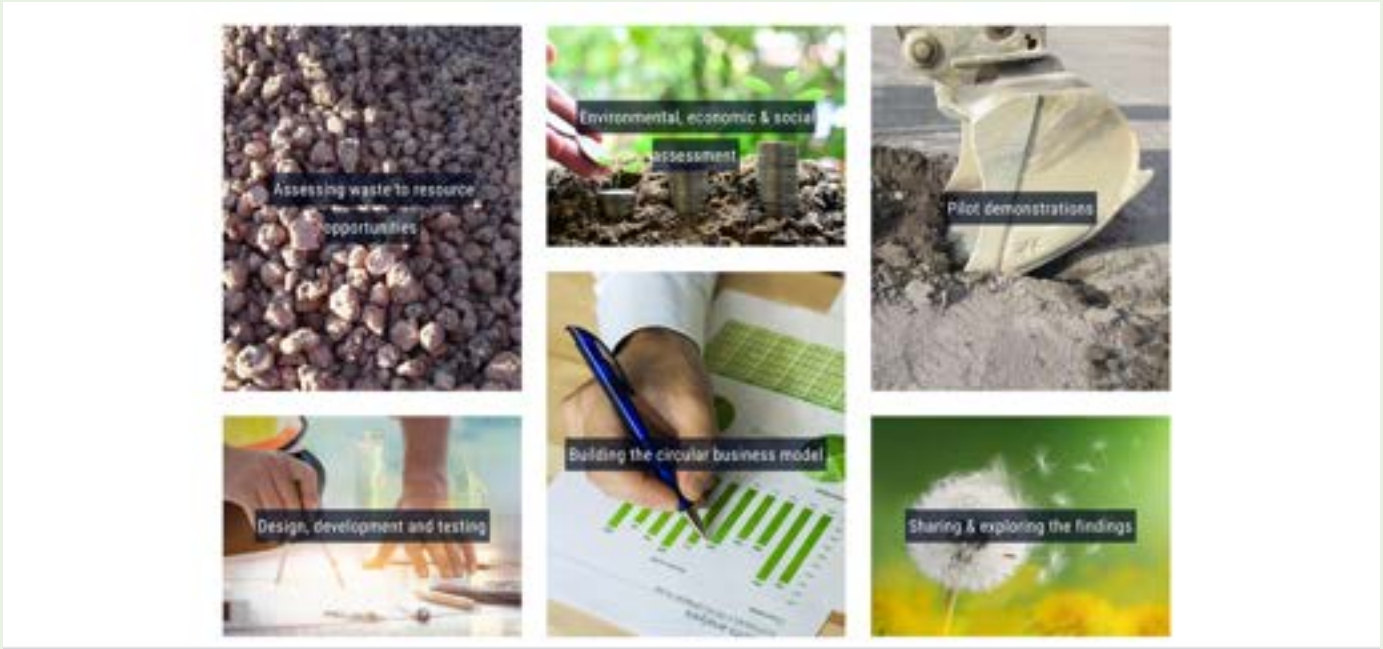
Circular Construction Marketplace

COMPANY	**CINDERELA**
COUNTRY	**EUROPEAN UNION**
WEBSITE	Link
FUNDING PROGRAM (IF ANY)	

Description

The CINDERELA project developed a digital platform called CinderOSS, serving as a "one-stop-shop" for companies to manufacture and apply secondary raw material-based construction products. This platform facilitates the buying and selling of recycled construction materials, promoting the rebuying of such materials and supporting circular economy practices in the construction sector.


CINDEROSS
Research and Development
3D printing with
recycled plastics
Read more


Assessing waste to resource
opportunities
Environmental, economic & social
assessment
Pilot demonstrations
Design, development and testing
Building the circular business model
Sharing & exploring the findings


CEBM
Legal
Marketplace
Project
CINDEROSS
DATABASE
Community
Product

zerowaste

PARTNERS

ALVE

vidipost

VERDE
RESEARCH CENTER FOR INNOVATION AND SUSTAINABLE DEVELOPMENT

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