GREEN PLATFORM project 2021-2025

SirkTRE | CircWOOD

SirkMAGAZINE

Circular timber industry

SirkTRE

TOWARDS A FULLY CIRCULAR VALUE CHAIN FOR WOOD

FINAL 2025

sirktre.no

SIRKTRE - the circular shift

Thank you for opening this final edition of SirkMAGAZINE!
We will offer a glimpse of a safe and resource-efficient future. SirkTRE shows a future circular timber industry — resulting in significant reduction of our carbon footprint.

SirkTRE has been a strong and committed consortium. There is a clear willingness within the industry to embrace circular transformation — we have addressed reuse of solid wood and woodchips, pilots, technology, standards and science. Changing the perception that energy recovery is the only viable end-of-life option for wood remains a major challenge. To support this shift, we have defined SirkTRE's Circular Building Principles (see backside of this Magazine). Please help us distribute these to support a sensible transformation toward a circular timber built environment.

Throughout SirkTRE there has been open webinars, annual seminars; streamed and available at sirktre.no. We have built the pavilion at World Conference on Timber Engineering in Oslo 2023, provided several hundred disseminations, written five standards, all in addition to extensive ongoing project work in the 20 tasks. Many of these tangible results are presented in this edition of SirkMAGAZINE. Do not hesitate to contact the individuals listed alongside the circular wood products. While we may not yet have a well-functioning market, we have tested a wide range of solutions — and uncovered promising, paths toward a circular future for timber.

Just as innovative building methods have transformed the construction industry in recent decades, we at SirkTRE believe that transitioning to a circular timber economy is the way forward. But the road ahead is anything but simple.

During SirkTRE, new requirements have been introduced into Norwegian building regulations, TEK17:2023, including greenhouse gas accounting planned for buildings, reuse mapping, and design for future disassembly. However, key elements are still lacking; like limits on greenhouse gas emissions, mandates for the reuse of suitable mapped materials, and clear, unconditional requirements for disassembly-oriented design.

CircWOOD, the research component of SirkTRE, will continue until the summer of 2026, to allow the completion of four PhD projects and the publications of important research.

With belief in a circular future — read on and be inspired!

PROJECT MANAGER GROUP

From left: Ivar Ragnhildstveit, Kristine Nore, Urda Ljøterud Høglund, Per F. Jørgensen, Lone Ross, Erik Larnøy, Christine K. Jørgensen.

HAVE A LOOK AT SIRKTRE'S SHORT INTRODUCTION VIDEO BY SCANNING THE QR CODE.

CONTENTS

CIRCULAR TIMBER CONSTRUCTION IN NORWAY

Building a Future That Lasts

By Wendy Wuyts (PhD) and Kristine Nore (PhD), Omtre AS

Norway has always been built with wood. It's natural, renewable, and deeply tied to tradition. But here's the twist: for timber to truly help fight climate change, we need to keep it in use for over 150 years. Right now, most buildings don't even make it to half that age. When they're torn down, almost all the wood ends up burned or chipped. What if we could change that?

The SirkTRE project is exploring how circular economy (CE) strategies can give timber a longer, more valuable life —benefiting not only the environment, but also the entire construction value chain and Norwegian society —from industry to cabin users to policy makers.

Beyond Recycling: What Does Circularity Really Mean?

When people hear "circular economy," they often think of recycling. But circularity goes further. It's about slowing down the flow of materials, making sure products stay in use as long as possible. For timber, that means reusing beams and panels from old buildings rather than turning them into chips or burning them for energy. Circularity is not just about reducing waste —it's about designing buildings so their parts can have multiple lives, keeping the carbon locked in wood where it belongs.

Strategies That Make Timber Circular

So, how do we make this happen? One big idea is Design for Deconstruction —building in a way that makes it easy to take structures apart and reuse the components. Think of it as designing buildings like giant Lego sets, ready to be reassembled.

Other strategies include tracking timber components digitally, creating marketplaces for reclaimed wood, and even rethinking ownership models so reuse becomes the norm. While business models for timber reuse are still developing, they hold huge potential to reshape the construction industry.

Cascading Use: Giving Wood Multiple Lives

Imagine a plank of wood that serves as a structural beam in one building, then later as flooring in another, and finally as furniture before it's ever burned for energy. This is the cascading principle in action —making sure timber goes through the maximum number of uses before reaching its end of life. Today, much of Europe's demolition wood skips this journey and is burned right away. To unlock timber's full environmental potential, we need to slow this process down and prioritize reuse over downcycling.

Measuring What Matters: Assessing Circular Timber Solutions

How do we know if a solution is truly circular? This is where circularity assessment comes in —but it's not the same as a traditional life cycle assessment (LCA). While LCA measures environmental impacts like carbon emissions or energy use, circularity assessment looks at how well materials stay in use, how easily they can be reused, and how many life cycles they can go through. These two approaches complement each other but focus on different questions.

In SirkTRE, we also explored how circular products perform technically and environmentally. Yet it's important to think on multiple scales: a solution that seems less positive at the product level may contribute to much better outcomes when evaluated at the building or system level. Some circular products do not score well in LCA, which is why we also started to investigate business models that enable multiple uses and reduce long-term environmental impacts. For these innovations to thrive, supportive policies and infrastructure are essential.

In Norway and across Europe, the debate continues on how to standardize and harmonize these methods. SirkTRE has contributed to this conversation, with researchers and industry partners testing assessment tools in real projects —such as the Nydalen pilot —and reflecting on what works and what needs improvement. Although SirkTRE is now coming to a close, the work is far from over. European projects like WoodStock, CIRCULEss, RAW, and DRASTIC —all involving SirkTRE partners —are taking these frameworks to the next level, shaping how circular timber solutions will be measured and designed in the future.

Learning Along the Way: From Ambition to Realism

At the start of the project, the SirkTRE consortium boldly communicated that our circular solutions could help facilitate 8% of Norway's Paris climate commitments. This was an ambitious and motivating vision. However, as the project unfolded, we learned to be more humble. We encountered major challenges: a non-existent market for reused timber components, limited readiness among many actors —from policymakers to industry players —and a lack of involvement from key intermediaries such as insurance companies, banks, and investors, who also need to develop strategies and frameworks to support circularity. Furthermore, the necessary facilities and infrastructures to make large-scale reuse a reality are still missing.

We are just at the beginning of this transition. While we have collected some promising environmental data from SirkTRE buildings and products —presented in a recent conference paper (see QR code) — much more research, funding, and development is needed. Tools for banks, investors, and real estate agents must be created, because the circular economy is not only about managing material flows and stocks, but also about managing financial flows and stocks. This shift must be guided by ethical and just frameworks, where governments and major financial intermediaries play a critical role in steering how these flows evolve to support a truly circular and sustainable future.

Your Invitation: Discover the Many Faces of Circular Timber

Across Europe, policies are starting to push for more reuse and recycling in construction. Norway is part of this shift, and projects like SirkTRE are helping the industry adapt.

But it's not just about rules —it's about collaboration. Designers, contractors, demolition companies, and policymakers all need to work together. The good news? Momentum is building, and innovative solutions are emerging that make circular timber construction not only possible, but profitable.

This magazine is your guide to what's happening right now in Norway's timber sector. Inside, you'll find innovative products designed to be reused again and again and stories from stakeholders who are leading the change

Circularity is not a distant vision —it's something we can build today. By learning, sharing, and applying these strategies, we can make timber a material that truly stands the test of time. Ready to see what circular timber construction looks like in practice? Dive into this issue and explore the solutions shaping a more sustainable, more circular future for Norway's most traditional building material.

Contact us on info@omtre.no if you want to be part of the bigger Nordic circular timber narrative. Everyone matters and has a role to play in the bigger story

.

Kristine Nore is the project manager of the SirkTRE project. In Omtre, Wendy Wuyts is responsible for the European Union funded projects RAW and DRASTIC. In the past years, insights from SirkTRE and European projects have been fertilizing each other.

CIRCULARITY INDEX

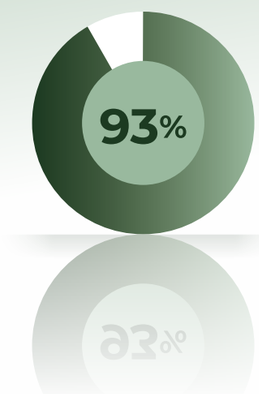
To give an indication of the value of the work done in SirkTRE Ellen MacArthur Foundation Circularity Indicators – have been used to evaluate certain products.

The Material Circularity Indicator (MCI) is a free Excel-based tool for measuring how circular the material flows of a product are. It includes an assessment of:

- Inputs (what the product is made of and where those components come from)
- Outputs (what happens at the end of the product's life)

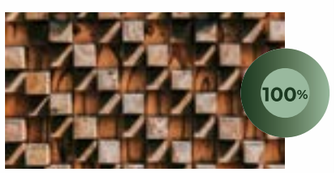
The methodology encompasses material flows and a range of complementary indicators, thereby allowing companies to estimate how advanced they are on their journey from linear to circular in terms of their products and materials. The indices developed consist of a main indicator, the Material Circularity Indicator, measuring how restorative and regenerative the material flows of a product or company are, and complementary indicators that allow additional impacts and risks to be taken into account. The MCI tool and futher explenation can be found on Ellen Macarthur Foundations webpages, og by following this link.

The Nydalen installation has a Circularity Index score of 93%.



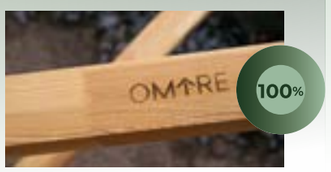
Nydalen Fabrikker
In the SirkTRE project, partners came together to showcase their sustainable solutions at Nydalen Fabrikker. The structure itself highlights circular design in practice—built with Omtre's reclaimed timber, wall panels and doors from Norsk Massivtre, and Grapes' reusable wall system.

Holar - A low-carbon kindergarten



Omtre - Repurposed wood for interiors

Omtre - Modular creativity with Reblåkk



Omtre - Rejoin - Scaling up wood reuse

Norsk Massivtre - Building elements in Mass timber

Haugen Zohar Architects and Norgeshus - Circular building system

Grape - Circular Interrior Wall System

Ombygg - Ombygg Ressurssentral

Aanesland Treindustri - Wood-to-wood connections

Reusable BUILDING MATERIALS

Sirkulær Ressurssentral AS| Emil Andresen Rygh

Through the sirkSENTRAL project, Sirkulær Ressurssentral, Resirqel, and partners successfully realized Ombygg, a physical resource center in Oslo dedicated to reclaimed building materials.

Although the establishment of the reuse hub in Oslo was an independent initiative, participation in the SirkTRE project became a natural extension of this work, enabling further development and alignment with national reuse efforts. Focused primarily on timber, we established logistics, tracking systems, and operational models to support reuse. Over 150 tons of reclaimed timber were processed. Donor projects like Aker Hospital and Politihuset Øst supplied materials, while new integration examples, such as the material deliveries for the DNT Oslo-built sauna at Torfinnsbu, demonstrated reclaimed materials' practical applications.

Ombygg now acts as a logistics hub and marketplace, contributing to real-world scaling of circular construction practices and CO_2 savings in the sector.

Key learnings

The need for active partnerships: Engaging construction, demolition, and real estate sectors is critical to building both supply and demand. Documenting CO_2 savings adds significant value for customers and strengthens the circular economy narrative. The commercial potential: Properly processed and marketed materials can be both profitable and attractive to customers.

Conclusion

Through the sirkSENTRAL initiative, Sirkulær Ressurssentral, Resirqel, and our partners have demonstrated that systematic reuse of building materials is both achievable and scalable.

Sirkulær Ressurssentral and Ombyggs central in Oslo stands as a real-world example of how physical infrastructure, operational models, and partnerships can drive circularity in the construction sector — making circular solutions a practical reality.

Product ▸

▾ Ombygg Ressurssentral

CIRCULARITY INDEX

100%

Price

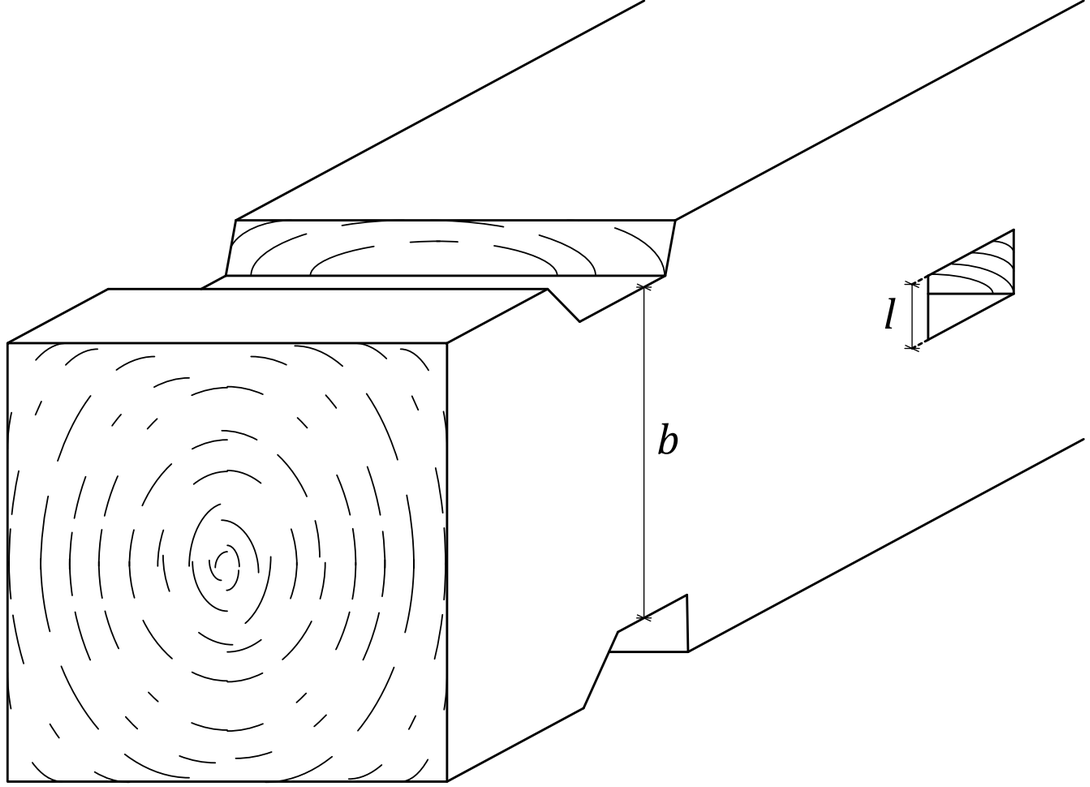
Prices for reused construction products can be found at Ombygg.no, or follow the QR code.

Contact

Ombygg AS
+47 22 12 02 84
post@ombygg.no

Sirkulær Ressurssentral

OMBYGG



NEW STANDARDS
for Reclaimed Wood

Standard Norge | Amalie Svendsen

The goal of the project was to develop standards that enable the quality assurance and increased reuse of wood materials. This supports the circular economy and helps reduce both waste and climate impact from timber-based construction materials.

In Norway, approximately 800,000 tons of wood are discarded or incinerated annually, with about one-third coming from construction waste. Reusing just half of this could save two million tons of CO_2 emissions—around 8% of Norway's climate commitments. Although wood is well-suited for reuse, the lack of common practices has made it difficult to assess, document, and repurpose used timber safely and efficiently.

To address this, the Norwegian standardization committee SN/K 267 Wood and wood-based products, in collaboration with European experts, SN/K 77 Timber structures, and the circWOOD research project, developed the NS 3691 series: Evaluation of reclaimed wood. Testing at the Norwegian Institute of Wood Technology (Treteknisk) supported the development and was published in a scientific article. The standard series consists of three parts

NS 3691-1 defines terminology and sets general requirements for evaluating reclaimed wood, whether solid or chipped.

NS 3691-2 categorizes different types of contamination or treatment, such as surface coatings or foreign materials.

NS 3691-3 provides guidelines for visual strength grading of rectangular reclaimed wood (spruce and pine), allowing for safe reuse in load-bearing structures or as input for products like glulam or cross-laminated timber.

Development
Developing these standards required extensive testing and expertise, as reclaimed wood is still a relatively new field. The result is a set of practical tools ready for use, with the potential to change current practices and promote a more circular and sustainable construction industry. The strong interest following their release is encouraging, and user feedback will be vital for future improvements.

Product ▸
◂ Reclaimed wood standards

Circularity
The standard enables wood reuse in new structures and products. This contributes to increased resource utilization and less waste.

Product description
NS 3691 Evaluation of reclaimed wood provides a standardized method for evaluating used wood.

Price
Prices can be found on Standard Norges web page or follow the QR code.

Contact
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+47 47 28 28 81
asv@standard.no

Standard Norge

Treteknisk

From OFFCUTS TO CONSTRUCTION

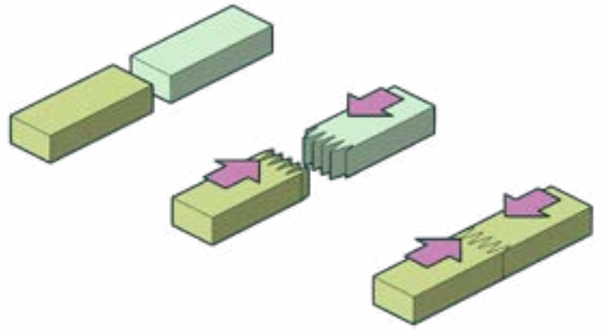
Omtre AS | Ivar Ragnhildstveit

In Norway more than 1 million m³ of wood is discarded each year, much of it in short lengths considered low-value. However, these pieces represent a significant and underutilized resource for sustainable structural timber.

As demand for eco-friendly materials grows, our aim is to utilize all wood pieces longer than 15 cm. Through this project, we gained a clear understanding of the available quantities and qualities. With efficient collection and logistics, short wood segments are delivered to our finger-jointing facility, which includes multiple stages for sorting, cleaning, and quality control. Final products are tested and certified to meet current standards. Reliable supply chains for reclaimed wood must be developed with industry partners. Setting up a finger-jointing line with pre-treatment is a major investment, and customers expect consistent delivery. Product characteristics — surface, cross-section, and length —can be tailored to individual needs. Target customers include builders' merchants, contractors, and wood industry.

Building confidence in reclaimed timber requires close collaboration across the market —from authorities to end users. Strong processes and partnerships are key to growing this value chain. While finger-jointing is well-established, upstream challenges remain. Material availability, logistics, and cost are critical. We have focused on optimizing the entire process —from intake to jointing. The facility must handle various species, dimensions, and qualities. Screws, nails, and treated or painted wood must be removed.

A final quality check ensures that only clean wood is jointed. Fast and efficient upstream processing is essential to maintain supply. We continue to support the development of reclaimed timber through further EU-funded projects.



Feasibility
Feasibility studies have identified locations for the Rejoin line as well as technical requirements. Discussions with suppliers have led to concrete implementation scenarios.

Opportunity
80% of timber waste from construction and manufacturing is burned.

30% of todays timber raw material could be supplied with post consumer wood. Ensuring use of this quality and quantity is vital in a sustainable society.

Timber waste comes in all shapes and sizes, and needs to be sorted. Sometimes the wood is contaminated with paint, nails and dirt.

Omtre documents the reuse of carbon in building systems and is preparing to meet future requirements set out in the Carbon Removal and Carbon Farming Framework (CRCF, 2024) as well as the Programme for the Endorsement of Forest Certification (PEFC) for sustainable forest management.
The carbon stored in Omtre's products also contributes to compliance with Energy Performance Certificate (EPC) requirements, thereby enhancing overall energy performance.

Product ▸ ◂ Rejoin - Scaling up Wood Reuse

CIRCULARITY INDEX

Product
Omtre provides fingerjointed, quality assured postconsumer wood for the timber industry.

~55% reduction in Global Warming Potential (GWP) across two life cycles*

Decarbonization potential: ~29 kg CO_2-eq/m²

Price
Fingerjointed timber is competitive in pricing.
Contact us for information on delivery capasity and a quote.

Contact
OMTRE
+47 92 26 52 57
info@omtre.no

OMTRE

MAPPING BUILDINGS

For Reuse

Omtre AS | Christine Jørgensen

Across Norway, many buildings stand empty. Inside them are materials and underutilized spaces. What if we could access that information – digitally?

By mapping these buildings, we can extract data on the materials they contain – and use it to support reuse efforts or propose new ways to repurpose the structures. It also serves as solid documentation of the building's current state.
In the BYGGKART project, a 3D scanner from Leica Geosystems was used to map buildings. When a building is 3D scanned, millions of points are projected – each measuring where it lands. This creates a digital point cloud. The scanner also captures images, which adds color recognition to the environment. The result is a colored, measurable, digital 3D model of the building.
The project also tested the use of a handheld XRF device on materials. This X-ray tool can detect values for heavy metals and other hazardous substances. It has helped assess whether materials are suitable for reuse.

The project explored how digital tools can be used with a reuse perspective, developing broad insight into old construction techniques and testing new digital methods. Still, the most important factor is contact with building owners – they want to reuse, but don't know how. This needs further research, because the market is ready!

Contact
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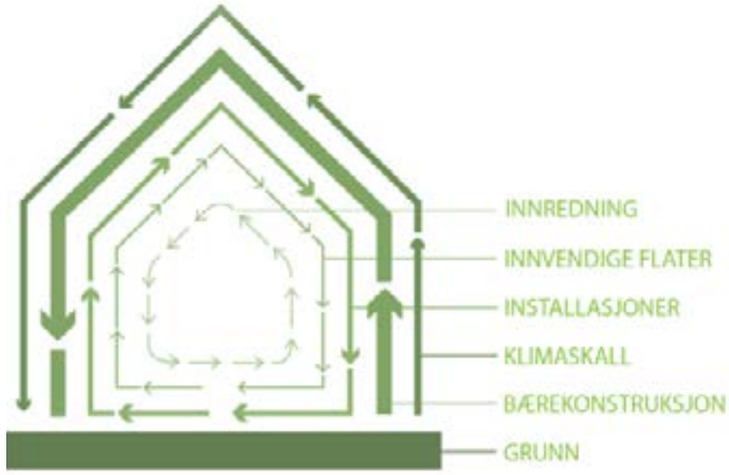
info@omtre.no

OMTRE

planning for future

DISMANTLING OF A BUILDING

Statsbygg | Lars P. Bingh



Layers of a building: expected life time will vary according to the layers in the building.

Reuse strategy for future dismantling according to the expected life time for every layer of the building.

The task in the Work Package PUBLIC, has been to demonstrate how circular measures in wooden constructions can be realized.

The work package has mainly focused on improving systematics to implement circular solutions on public projects, but also actual reuse, like when construction wood from the new government quarters has contributed to a new sauna at Torfinnsbu in Jotunheimen (Byggherre DNT Oslo og omegn).

The building code in Norway (TEK17) states that buildings shall be planned and built for future dismantling when economic and practically feasible. There is a lack of guidance in how future dismantling is to be done in reality. Statsbygg has produced a methodology on how to address this issue in public projects. The methodology, when implemented, can lead to buildings that will be easier to dismantle in the future, but also to longer lasting buildings that fits with the expected life time for the building.
The guidance includes six main steps: establish a plan for the expected use time for all the main building layers in a building, develop a strategy for reuse, choice of materials, plan for dismantling, evaluation and improvement, documentation during construction phase. The core essence is to develop criteria for every building part in line with the expected use time for the building part. The methodology includes a guidance and a template for writing instructions for dismantling, step by step.

STATSBYGG

OLD BARNS

A Valuable Timber Resource

Omtre AS | Ivar Ragnhildstveit

Old barns hold a wealth of high-quality timber. Through selective logging of the right trees from local forests, combined with craftsmanship and knowledge, many barns are still in good shape.

However, many are no longer in use due to modern farming requiring larger and heavier machines. As a result, these old barns often become a cost burden for farms, with maintenance being de-prioritized. We must find systems and methods to preserve this timber for reuse before the buildings deteriorate too much.
Reusing old barn timber brings major environmental benefits compared to decay followed by demolition, and the wood ending up as firewood or landfill. Our work has focused on methods for effective disassembly aimed at reuse. The process always starts with a site visit and condition survey. Several barns were unfortunately too far gone, making reuse of the timber impossible. In the viable barns, timber volume and cladding area were mapped for reuse. At the same time, construction details and initial planning for stability during dismantling were assessed. Access around the buildings and space for disassembly, storage, and logistics were key for a smooth workflow.

Before work begins, a local demolition permit must be granted. It is also necessary to investigate whether any hazardous materials are present.

A written agreement with the client defining responsibilities and boundaries is essential for good cooperation. For the dismantling itself, we mainly used an excavator with a grapple. For taller structures, a crane truck with a personnel basket proved to be a safe alternative for securing parts at height.

Wall cladding
We create unique wood panels that add warmth and texture to your interior. By using this sustainable material, you can create solutions that combine aesthetics and environmental awareness.

Acoustic solutions
Barn wood and residual wood provide a natural style and can be used to build walls and ceilings with acoustic properties. The material adds unique character to the room and improves the sound environment.

Decorative elements
We offer carefully selected reclaimed barn wood and residual wood that adds a rustic, authentic feel to your interior. The material is perfect for decorative purposes such as frames, worktops or details in walls and ceilings, creating a natural, warm atmosphere in any room.

Product ▸

◂ Repurposed wood for interiors

CIRCULARITY INDEX

100%

Circularity
Reusing barn wood provides significant environmental benefits by storing carbon dioxide and reducing the need for virgin wood

Product description
Omtre adds value to old and used wood through processing. The cleaned wood is turned into useful products or sold on as raw material to interior architects, designers and architects.

Price
The solutions are competitive on both price and environmental impact. Contact us for a quote.

Contact
+47 92 26 52 57
info@omtre.no

OMTRE

WOOD FIBER BASED PANELS
in Flooring Solutions

Hunton Fiber AS | Thomas Løkken

The sub-project aimed to explore how sales volumes of wood fiber-based boards in flooring solutions can be increased, especially in a market dominated by cement-based screeds – particularly in systems with hydronic underfloor heating.

A key challenge is market conservatism: installers often prefer familiar materials and methods. We sought to challenge the status quo by documenting, testing, and highlighting the advantages of using wood fiber-based acoustic boards – both in terms of sustainability and functionality. We manufacture wood fiber-based acoustic boards with a low carbon footprint and excellent sound dampening properties. The boards are available in various thicknesses and can be delivered pre-cut with grooves for underfloor heating pipes and heat distribution plates. This offers a solution that:

- Places heating pipes near the surface, allowing quick temperature control Is suitable for reuse, provided no moisture damage.
- Is more sustainable than cast solutions, both in production and disassembly.
- Has the potential for future production using recycled materials.

During the project period, we carried out:

- Dynamic stiffness testing Carbon footprint analysis comparing the wood fiber solution with traditional systems.
- Development of a reuse guide.
- A successful full-scale pilot production at our Norwegian factory (commercial output currently limited by capacity – raw boards are now imported from Poland).

To understand how to promote the solution in the market, we mapped the value chain and conducted a market analysis. This provided valuable insights:

- Developers and specifiers (e.g. consulting engineers and architects) are key influencers in flooring system choices.
- Targeted and relevant information for these groups is essential to changing established practices.
- There is a growing market for sustainable, flexible, and reusable solutions – but performance documentation and assurance are critical.

Through this project, we have strengthened our position as a supplier of environmentally friendly, future-proof flooring solutions. Although the original ambition of widespread use of reclaimed wood had to be adjusted when a partner withdrew, we have gained valuable knowledge and documentation.
We see strong potential in further developing the product and its documentation to improve market positioning. At the same time, we continue communication efforts towards developers and consultants to help drive the green transition in the construction industry.

Product ▸ ▾ Wood fiber floorboards for waterborne heating

Hunton Silencio Thermo
Hunton Silencio® Thermo is a step sound board that provides good attenuation of step sound while being prepared for waterborne underfloor heating.

Fast and energy efficient
The pre-cut grooves for the water pipes simplify and streamline the job for the plumber. The stepped soundboards are energy efficient and require low water temperature compared to cast pipes, as well as providing faster temperature regulation.

Circularity
Mainly based on wood fiber from natural, renewable and 100% PEFC-certified spruce chips, which stores carbon throughout its life cycle.

Product description
Hunton Silencio Thermo is a sound-insulating step soundboard prepared for waterborne underfloor heating. The panel has pre-cut grooves for water pipes.

Price
The solutions are competitive in both price and environmental impact. Contact us for a quote.

Contact
Hunton Fiber AS
+47 61 13 47 00
kundesenter@hunton.no

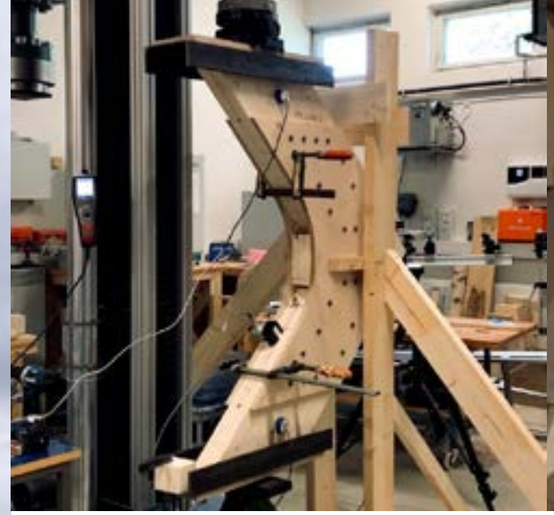
NORWEGIAN WOOD CLUSTER

HUNTON
Av naturen. For naturen.

WOODEN DOWEL CONNECTIONS

Designed for disasembly

Aanesland Treindustri AS | Gunnar Adolf Aanesland



The project Forbindelser was a collaborative effort dedicated to developing strong and adaptable timber connections for buildings. The focus was on designing joinery systems—such as wooden ridge joints—for solid timber elements, optimized for industrial-scale production and compatible with reclaimed or reused wood.

It ensured that these connections met structural, safety, and durability requirements while supporting circular construction principles. This included creating modular systems, documenting materials early, and designing for disassembly so that buildings could be adapted, taken apart, and rebuilt in new contexts.

Several pilot cases—pavilions, meeting places, and temporary urban installations—demonstrated how reused timber and wooden connections could be integrated into high-quality architecture. These examples showed how flexible, inclusive spaces could respond to changing needs while maintaining structural integrity and reducing environmental impact.

The project emphasized the importance of cross-disciplinary collaboration and aimed to influence how public spaces were designed and constructed. By rethinking timber connections, it promoted a circular building culture that united beauty, functionality, and sustainability in a practical and future-ready way.

The Ridge Joint

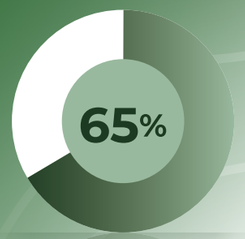
The team explored a new type of timber joint called a “ridge joint,” designed to handle multiple forces at once — such as pushing, pulling, and bending. Unlike traditional joints that typically use a circular pattern of wooden dowels (pegs) to connect the parts, this new design called for a different approach.

Because the wooden dowels used here are relatively large—about 20 mm in diameter—a circular arrangement would have allowed room for only a few dowels. To solve this, the designers created a parallelogram-like layout that fits more dowels into the joint area. This configuration not only makes better use of the available space but also improves the strength and stiffness of the connection. By placing the dowels strategically at the corners of the joint, the design increases the overall stability and performance of the structure.

This type of smart, space-efficient design is especially important when working with sustainable materials like wood, where optimizing every element helps improve both strength and resource use. The innovative layout demonstrates how traditional materials can be adapted through clever engineering to meet modern structural demands.

Product ▸

◂ Wood to Wood Connection



CIRCULARITY INDEX

Publications

Tian, F., Boccadoro, L., Ringhofer, A., & Ceccotti, A. (2023). **Moment-resisting ridge joints for prefabricated folded-plate timber roofs: Testing and numerical validation.** Construction and Building Materials, 367, 130361. https://doi.org/10.1016/j.conbuildmat.2023.130361

Aloisio A., Wang Y., Crocetti R., Nyrud, A. Q., Tomasi R. (2025) **Mechanical performance of pure-wood moment-resisting ridge joints with plywood gussets and wooden dowels**, Engineering Structures 334(3) 10.1016/j.engstruct.2025.120271

Product

This metal-free system ensures strength, durability, and full recyclability, combining industrial efficiency with a reduced environmental footprint.

Price

Pricing is competitive contact us for a quote.

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Aanesland Treindustri

NEW VALUE CHAIN

for Solid Wood and White Chips

Ragn Sells AS | Per Johannessen

As demand for sustainable materials rises and competition for raw resources intensifies, waste wood stands out as a valuable yet underused resource. Norway generates about 700,000 tons of waste wood annually, with around a third from construction and demolition—often of a quality suitable for reuse.

Despite its economic and environmental potential, value chains for waste wood are still missing. Much of it ends up in low-value uses like energy recovery. With proper solutions, it could be reused as solid wood, structural timber, or raw material for new products. For Ragn-Sells, this marks a strategic step toward high-value, low-carbon circular solutions.

Extensive work has laid the foundation for this new value chain. We've mapped the resource base, identified customer segments, streamlined product flows, and developed data collection methods. Life cycle assessments (LCAs) confirm the climate benefits of reuse. We now focus on turning this groundwork into practical, profitable applications.

In SirkTRE, Ragn-Sells has taken two approaches: repurposing quality waste wood for solid and structural use, and developing a supply chain for high-grade white chips for new products. The aim is a sustainable and viable system —from collection to market. A key step is new waste wood sorting standards that support delivery of standardized material back to the market.

So far, over a third of sorted wood is suitable for direct reuse. Early findings suggest a similar share could be recycled. But scaling up recovery is resource-intensive. Handling and logistics are major cost drivers. To address this, we've explored sensor technologies and smarter load carriers.

Our main finding is that the highest value comes from combining solid wood and white chip recovery. This demands close collaboration across construction, collection, manufacturing, and end use. Building a shared culture for this shift takes time. The solution lies not in isolated fixes, but in flexible, system-wide thinking.

Led by Per Johannessen at Ragn-Sells, with R&D support from NIBIO and the Norwegian Institute of Wood Technology (Treteknisk), this work brings waste wood's potential closer to reality. While challenges remain, we are better equipped —with deeper insight, clearer strategies, and greater readiness to succeed. The next step is clear: continue building a value chain that unites economy and sustainability —and gives waste wood a second life.

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Send gjerne en forespørsel om leveranser av resirkulert og ombrukt heltre eller flis. Vi tilbyr også komplette løsninger for innsamling og logistikk fra alle typer prosjekter slik at materialene kan gjenbrukes eller resirkuleres.

RAGN SELLS
En del av kretsløpet

THE ROAD TO CIRCULARITY

Hunton Fiber AS | Inger Gamme

In 2022, Hunton set ambitious climate goals for 2030, including making our own products circular. This means reducing environmental impact, cutting emissions, and extending product lifespan and value. As a building materials producer, we hold a key role in enabling a circular economy.

Our circularity efforts are driven by internal priorities and external requirements. EU regulations such as the Taxonomy, CSRD, revised Construction Products Regulation, and Green Deal are major drivers, alongside the UN Sustainable Development Goals.

We actively document our environmental performance, including through EPDs. Today, much of the leftover material from construction is discarded or burned directly on building sites. Increasing circularity will help reduce emissions and improve competitiveness.

Through the SIRK ISO project, we've mapped how our products are handled on construction sites, in renovation, and at waste facilities. We analyzed practices, technologies, and regulations among waste companies and examined whether leftover materials like Hunton Vindtett can be reused in production.

We also interviewed carpenters across six counties and explored opportunities for return systems, reuse, and redesign. Pilot examples include bio-based blocks using production dust, insulation scrap turned into decorative elements, and biochar made from residuals.

Two contractors are piloting material return from building sites. A concept study is assessing process design, equipment needs, contamination risks, and automation potential to support flexible reuse solutions.

Moving forward, collaboration and improved logistics will be essential to realizing the potential for circular resource use.

Hunton Vindtett™ and Hunton Vindtett™ Plus
The wind barrier boards provide wind resistance, thermal bridging reduction, dimensional stability, and additional insulation.

They also have hygroscopic properties, meaning they absorb and release moisture depending on the air's relative humidity. The impregnated fibers give the boards excellent moisture-handling capabilities.

Hunton Nativo Trefiberisolasjon
Provides excellent sound insulation, has documented fire resistance, and a low climate footprint.

Wood fiber insulation absorbs and releases moisture in line with the air's relative humidity, giving it strong moisture-handling properties. It is also comfortable to install.

Product ▲

▼ Wind barrier and insulation products in wood fiber

Circularity
The product is made from renewable, locally sourced, and 100% PEFC-certified spruce chips, and stores carbon throughout its entire lifecycle.

Price
The solutions are competitive in both price and environmental impact. Contact us for a quote.

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HUNTON
Av naturen. For naturen.

CIRCULAR ELEMENT

Turning the Time Forward to Circular Element

Norsk Massivtre AS | Arild Øvergaard

Through the project Circular Element, we have developed structural solid wood elements based on reclaimed timber, using Norsk Massivtre's screwed technique and the Technical Approval TG2498.

This enables disassembly, sorting, and reuse of materials in accordance with the NS3691-1 standard. The building elements can be used for walls, floors, and roofs, and are approved for reuse. Materials are collected in collaboration with a partner operating a reclaimed wood hub. The elements are then designed, produced, and transported according to specifications, and assembled in a way that allows for easy disassembly. Disassembly documentation (FDV) is included.

The project has faced resistance in an industry largely invested in linear solutions and with limited experience in circular practices. The inconsistent quality of reclaimed timber and the cost of sorting and processing make it difficult to compete with chipping. Additionally, using reclaimed materials demands a different workflow for architects, where the visual expression can only be developed after the materials have been selected.

At the same time, it has been inspiring to collaborate with actors in the waste industry who view waste as resourcesgone astray.

20-foot container
It has also been frustrating to see the lack of focus on commercialization — ideas are celebrated before proving their business value. Nevertheless, the project has led to concrete, commercial solutions, including a new production line housed in a 20-foot container, and a revised TG2498 featuring a new chapter on reuse.

Technical approval
We are now working on "TG2498-R," which will provide R-classification for reclaimed wood, and are developing a fully circular building with a load-bearing structure and exterior cladding made from reclaimed wood—designed for future reuse.

Circularity
Reclaimed wood fully or partially (hybrid) replaces new materials.

PRODUCT ▸
◂ Building elements in mass timber

CIRCULARITY INDEX
100%

Product description
The production is based on Technical Approval (TG2498). Complete solid wood kits for houses and cabins, or custom elements, are delivered.

The buildings and elements are screwed, enabling disassembly and reuse. Design, production, delivery, and assembly are offered.

Price
The solution is competitive in both price and environmental impact. Contact us for a quote.

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NORSK MASSIVTRE

MODULAR CABINS

LY Hytta's Path to Circular Construction

Lyhytta AS | Bjørn Olav Leer

LY Hytta AS, based in Sigdal, Norway, designs and produces modern modular cabins. Their "Glimre" series combines Scandinavian aesthetics with flexible layouts, from compact 38 m² solutions to larger family cabins. The cabins are built indoors as modules and then transported for assembly on site, a method that reduces waste, shortens building time, and improves quality by protecting materials from weather.

As part of the national research initiative SirkTRE, LY Hytta took part in the project Digiprod 3: Digital production. The project set out to review existing production processes, map material use and waste, and test how digital tools could streamline planning, design, and assembly. The aim was to develop proposals for more circular solutions, strengthen information flow across design and production, and identify opportunities to integrate more efficient production technologies.

The project resulted in a structured review of LY Hytta's production methods and provided concrete proposals for improvement. While the main outcome was increased knowledge and awareness rather than large-scale change, the work gave the company a stronger basis for future steps in sustainable and circular production.

Sustainability is also reflected in LY Hytta's cabin offering. The cabins are designed with large windows for natural light, and customers can choose energy-efficient upgrades to reduce energy needs. Indoor prefabrication supports better material utilization, while modular construction offers flexibility and limits unnecessary resource use.

Through participation in SirkTRE, LY Hytta contributed to broader efforts in the Norwegian timber industry to develop circular value chains. The project strengthened the company's understanding of where improvements could be made and positioned LY Hytta to continue developing sustainable cabin production. Building on these insights, the company's cabins today reflect both its design philosophy and its ambition to integrate more circular practices in the years ahead.

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LY HYTTA

NEXT-GENERATION AUTOMATED PRODUCTION

Landheim AS | Espen Pettersen

Industrialized timber construction is essential for building faster, smarter, and with a lower footprint. Yet, the Norwegian element industry has faced bottlenecks: limited automation, slow window installation, balancing issues on production lines, and difficulties integrating reused materials. For SirkTRE's vision of circular timber value chains to succeed, these challenges needed to be understood and addressed.

Landheim set out to create a fact-based foundation for the next generation of production lines: flexible, robot-based systems designed for circularity, cost efficiency, and digital control. The ambition was to explore how advanced automation and simulation tools could support both conventional and reused timber in high-quality building components.

Through systematic mapping of more than 30 Norwegian producers, benchmarking of over 15 automation technologies,andcollaboration with NTNU, BoligPartner, and DataFormLab, Landheim documented production capacities, tested scenarios, and simulated different factory layouts. These analyses revealed key bottlenecks, evaluated technologies like Weinmann and Randek, and created a KPI framework for investment decisions and future pilot factories.

The journey was not without challenges —partner changes and market disruptions forced flexibility. Yet, the project strengthened Landheim's competence, improved industry insight, and demonstrated the power of digital twins and simulation. The main lesson: automation and circularity must go hand in hand for a resilient timber industry.

Simulation-driven factory design: Landheim and DataFormLab developed digital models comparing different automation setups. From long-line Weinmann systems to modular robot cells, simulations provided insight into throughput, staffing, and flexibility. This data supports investment in future-proof factories that can adapt to reused timber and changing market needs.

Bottleneck analysis in element production: Window mounting, insulation handling, and line balancing were identified as critical constraints. Landheim's research documented where automation adds the most value. This knowledge enables producers to prioritize upgrades step by step, reducing risk and preparing for circular material flows.

Circularity is enabled through flexible, robot-based production lines designed to integrate reused timber and optimize material efficiency at scale.

The prosject has resulted in decision-support tools, simulation models, and best-practice benchmarks for establishing digital, automated, and circular element production lines in Norway.

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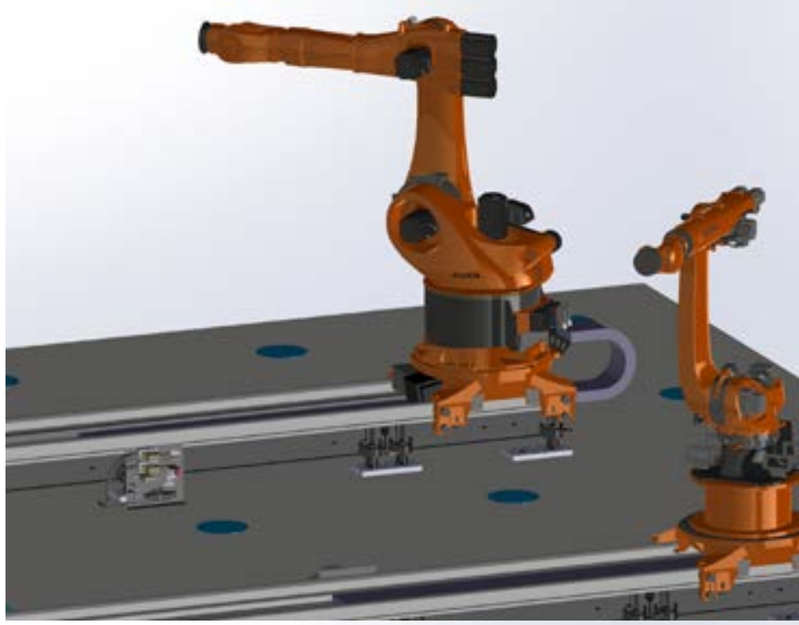


A CIRCULAR BUILDINGSYSTEM

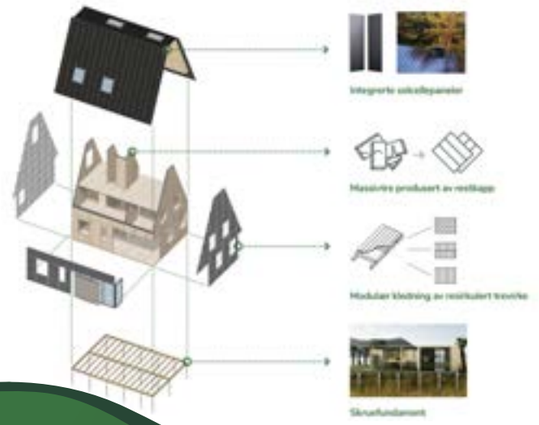
For the Future

Haugen/Zohar Architects AS| Marit J. Haugen

The building system is based on circular principles with a focus on low climate footprint and reused materials, as well as ensuring future reusability.

Measures for future reusability are about arranging and designing building components so that they can be dismantled easily at the house's "end of life" date. With these measures, we ensure that components retain their function in the next life cycle, in a new house. This means that materials can be reused instead of being landfilled, a measure that helps reduce construction waste and greenhouse gases for current and future generations.

In addition to the environmental savings, using modules and standard elements will simplify the construction process and reduce assembly time. We call that a win-win!



Architectual design ▸

▾ Circular building system

CIRCULARITY INDEX

Circularity
A circular house is a healthy house with extensive use of wood, minimal CO_2 footprint, and a particular focus on a circular material bank.

The product is a modular, prefab housing system designed with a focus on sustainability, low CO2 emissions, and circular construction principles. It features climate-adapted, healthy structures that are easy to disassemble and reuse.

Circular building components
In collaboration with the building industry, we develop circular components and systems. Using facade elements from reclaimed wood brings circularity to the exterior. Modular design shortens assembly and eases future replacements. With varied designs based on available recycled wood, each house gains a unique and personal look.

Materials
The use of mass timber defines larger parts of the interior surfaces but can be treated in various ways. The exterior cladding is intended to be made from reused wood, and Sirkbo is currently working on different solutions with varied expressions. Pilot participants can help choose the desired appearance.

Price
The solution is competitive in both price and environmental impact. Contact us for a quote.

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HAUGEN/ZOHAR ARKITEKTER

Up:Grape a Fully Circular
WALL SYSTEM

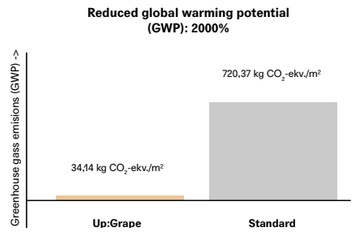
Grape Architects AS | Angelica Kveen / Alexander Mertenes

Up:Grape is a fully circular wall system, designed for easy conversion and for disassembly, built mainly from reclaimed wood.

We aimed to highlight the environmental value of the reclaimed wood wall and explore both the opportunities and challenges it presents from a circular economy perspective. Lease agreements for commercial spaces typically last 7–10 years, which unfortunately often also reflects the lifespan of interior partitions and light walls. The goal was to develop an alternative that supports circular economy goals through reusability, maintainability, and reduced environmental impact.

The Up:Grape wall system is based on traditional woodworking, with minimal use of nails, screws and glue. The construction principle consists of a locked frame with guiding grooves for wood stacked vertically. The system takes into account the often shorter lengths of recycled wood, which is why it was historically used in sheds and farm buildings to save materials. The wall system is designed to meet acoustic requirements, and offers a high degree of flexibility and modularity.

The research project delivered two fullscale prototypes and tested various surfaces and insulation methods, and a pilot at Nydalen Fabrikker (no acoustic requirements) where walls for the market hall have been built during spring 2025. The pilot project at Nydalen Fabrikker was conducted in collaboration with Omtre and Norsk Massivtre.



GWP Comparison: Up:Grape / Gipsum acoustic wall

Up:Grape
STRUCTURAL PRINCIPLE

Up:Grape
ACOUSTIC WALL R`w=44 dB

Referace wall
STANDARD GYPSUM WALL
R`w=44 dB

Product description
An adaptable, flexible system that is designed for easy conversion and for disassembly. It can adapt to varying requirements, such as different room heights and technical grid configurations. New and recycled timber can easily be combined.

Acoustic tests
Preliminary full-scale acoustic tests have been conducted in collaboration with Brekke Strand, confirming compliance with requirements. The tests show that the prototype meets accoustic requirements between two meeting rooms with R'w=44dB (field-measured), making it a viable alternative to a standard acoustic wall that fulfills the same requirements.

Team
Angelica Kveen, Alexander Mertens, Jannicke Stadaas, Aleksander Rene
Acoustics: Magne Skålevik, Brekke Strand.
LCA: Grape Architects.
Circularity: Vill Energi.

Architectual design ▸
◂ Circular interior wall system

CIRCULARITY INDEX

100%

Circularity
A life cycle assessment showed this wall system has over 20 times lower greenhouse gas emissions than standard steel and gypsum acoustic walls, assuming multiple tenant changes over 60 years.

Price
Value added through extended life of materials, resource efficiency, reusability, repairability and easy maintenance. Competitive in price and environmental impact. Contact us for a quote.

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Grape:

Demountable APARTMENT BUILDING

Fragment AS | Arild Eriksen

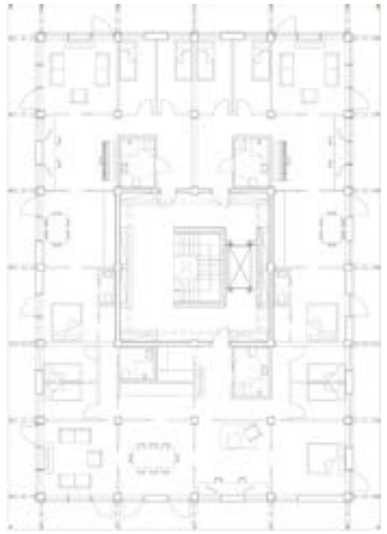
SirkTRE will establish the fully circular value chain for wood by facilitating and demonstrating the reuse and recycling of waste wood in practice.

The value chain includes mapping, planning, dismantling and logistics, treatment including sort-ing, splicing and reformatting, as well as new industrial use of waste wood. Solid wood and chips are used in new buildings, which are increasingly being built for conversion.

Rammeverk is a building model that both uses reclaimed wood and is optimized for conversion.

It is a simple and durable building with clear references to traditional Norwegian architecture, pointing the way toward a circular building practice rooted in history — well-suited for a structure designed to last longer than most buildings constructed today.

Team
Arild Eriksen, Thea Chronie De-Maria, Cathrine Finnema, Kristoffer Røgeberg, Lisa Barahona, Vilㅣl Energi and Degree of Freedom.



Design
RAMMEVERK is a construction kit for a demountable apartment building made of timber structures. It has a fixed column grid developed through an iterative process together with a reference group, and shafts for pipes, ducts, and vertical connections are placed to allow for many different apartment sizes. It is a building that can be easily reconfigured to accommodate changing needs.

Modularity
Rammeverk is an apartment building constructed entirely from wood, from the inside out. The building can be ordered as a flat-pack from the factory, with all modules delivered ready for assembly. It also integrates a variety of components made from recycled wood. Wooden structures, solid wood walls, wood fiber insulation, windows, cladding, wooden decks, and other elements made from recycled materials are all currently under development.

Architectual design ▸

▾ Demountable apartment building in timber

Circularity
Its modular, demountable design and light footprint not only support material reuse but also make it easy to reconfigure or repurpose the building over time — extending its lifespan and minimizing resource waste.

Price
As a kit of repetitive modules with few variations, and with a short assembly time, it offers a highly cost-effective way to build. Contact us for more information

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FRAGMENT

BÅTSFJORD KINDERGARTEN

Local Reuse in Practice

Holar Ola Roald AS | Jason Mrdeza

Båtsfjord Kindergarten is a pilot project that uses timber construction and reclaimed materials from buildings slated for demolition to design and build a new kindergarten in Finnmark.

Holar Arkitektur developed a series of methods for local reuse, resulting in a carbon footprint approximately 85 percent lower than that of a conventional new build.

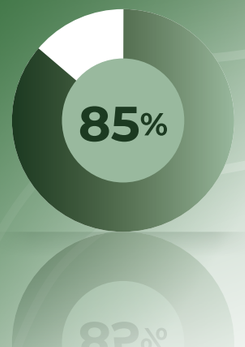
The methodology included mapping available materials, employing parametric tools to integrate reusability data into BIM models, and analyzing the transformation potential of existing buildings. This led to the adaptation of the structure from Nordskogen School, where the interplay between new and existing elements became the project's core concept.

Reclaimed wood from deconstructed buildings was also used for furniture, walls, and façade elements, adding a second layer of circularity to the project. Designing with reclaimed materials became an active part of the process, where material properties and quantities influenced both form and detailing.

Material reuse in rural areas presents unique challenges, such as long distances to established systems and limited experience with deconstruction. In Båtsfjord, transformation and reuse were as much about process and dialogue with users and contractors as they were about practical execution. Collaboration, flexibility, and local engagement proved crucial to creating a kindergarten with both a low carbon footprint and a strong local identity.

Architectual design ▸

▾ A low-carbon kindergarten



CIRCULARITY INDEX

Circularity
By reusing materials from deconstructed buildings, the project minimizes waste, reduces carbon emissions, and fosters local collaboration for sustainable, site-specific construction.

Product description
A low-carbon kindergarten built with locally reclaimed materials, combining reuse-driven design, efficient material use, and circular construction methods.

Price
Our solutions are competitive both in cost and in environmental impact. We provide architectural services, material reuse mapping, and circularity consulting.

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holar

THE SANDPIT

Piloting New Ideas

Omtre AS | Urda Ljøterud Høglund

SirkINNOVASJON leads innovation and pilot activities within SirkTRE, playing a central role in developing circular timber solutions.

Through advisory and coordination efforts, the initiative focuses on two main goals: mobilizing resources and accelerating development. Support is offered to companies working with reclaimed timber, including help with funding applications, access to testing partners (Treteknisk, NMBU, NTNU, NIBIO), and matchmaking for financing.

At the same time, SirkINNOVASJON identifies promising ideas and launches demonstration projects — such as sirkBO, a circular modular housing concept, and LÅVE, which repurposes old barn timber into prefabricated components. Workshops and webinars help share knowledge and results across the network.

In 2022–2023, input from across SirkTRE helped map key needs in digitalization, certification, and funding. Regular networking meetings connected stakeholders from industry, research, and government —both in Norway and across Europe. In 2024, SirkINNOVASJON advised five pilot projects.

These included reuse of barn beams tested in Nydalen, circular housing prototypes, and development of new finger-jointing technology. Business planning support was provided to prepare for product launches.

By 2025, more than 30 new products and services will have emerged from SirkTRE, including certified structural elements, logistics tools, and jointed beam systems.

Over 10 companies have received funding assistance. Despite solid results, market acceptance of reclaimed timber remains a challenge. SirkINNOVASJON will continue to address this through collaboration with architects, industry, and regulators to promote tested, approved solutions.

OMTRE

EVIG 02 - BREKESTAD

a Demonstration

In the detailing phase, our focus has been on translating the project's circular principles into concrete, buildable solutions. This includes developing strategies that support a low climate footprint, maximize the use of reused materials, and ensure future reusability of building components.

Key efforts have included:

Designing for disassembly:
We've worked on detailing connections and joints so that building components can be easily dismantled without damage. This ensures that materials maintain their integrity and can be reused in future construction projects, rather than ending up as waste.

Standardization and modularity:
By incorporating modular design and standardized elements, we've simplified the assembly process and increased efficiency. This approach not only reduces construction time and cost but also supports material reuse, as standardized parts are easier to repurpose.

Material documentation and tracking:
We've developed systems to document reused materials and track them throughout the design. This supports future identification and reuse, making circularity more feasible over the long term.

Low-impact material selection:
In line with the low climate footprint goal, we've prioritized materials with low embodied carbon, including a significant proportion of reused and recycled components.

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HAUGEN/ZOHAR ARKITEKTER

RE:TEXTILE

a Demonstration

The Re:Textile project aims to build a small industrial facility using a sustainable approach, emphasizing circular economy principles.

The primary materials used for construction are reclaimed timber, glulam beams, steel roof plates, and insulation panels sourced from a decommissioned cryptomining warehouse located in Treklyngen industrial park, Årbogveien 100, 3516 Hønefoss. Additional reclaimed timber was supplied by OMTRE AS for structural and cladding purposes.

LCA (life cycle assessment) analysis shows how Re:Textile reduced environmental impacts by 38% to 95% in key categories like climate change, acidification, human toxicity, and resource use.

The project also achieves a total reduction of 8.6 tons of CO_2eq emissions compared to conventional methods, demonstrating the significant potential of circular construction to lower its environmental footprint.

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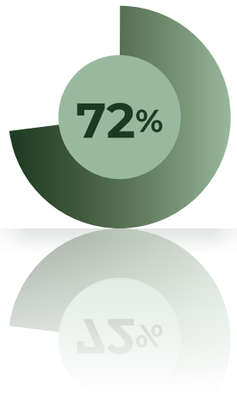

OMTRE

REBLOKK

a Demonstration

Reblåkk is a patented building system that is suitable for new buildings, remodeling and rehabili-tation.

The area of application is varied, but is well suited to constructing office partitions, wind walls, load-bearing walls, free-standing structures such as garages, tool sheds, annexes, etc.

How it works
Just like Lego, you can put these blocks together and let your imagination run wild. You don't need any special skills to build with the REblåkk building system. Just simple tools such as a rubber mallet, handsaw, drill and screws.

Product ▸
◂ Modular Creativity Reblokk

CIRCULARITY INDEX

Price
The solution is competitive in both price and environmental impact. Contact us for a quote.

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OMTRE

NETWORK

for sustainable and circular wood constructions

The wood building industry will benefit from developing more circular solutions and products. From 2025 Norwegian Wood Cluster will strengthen its focus on circularity and play an active role in developing circular pilots. The cluster will be a key meeting point for networking on circularity within the wood sector, organizing workshops, webinars, seminars and study tours during the next years.

Developed sustainability reporting for forest companies EU's taxonomy will have great influence on the wood sector, leading to new documentation requirements and financial opportunities. Addressing these issues in the SirkTRE project has provided new insights and tools to companies in the wood industry
Norwegian Wood Cluster initiated the SirkTRE project in 2021. Within the project, the cluster has organized several workshops and courses, as well as developed a guide for corporate sustainability reporting for wood-based companies.

Norwegian Wood Cluster's vision is to provide the world with innovative and sustainable wooden building solutions. The cluster was founded in 2017, and the members represent the entire value chain of the wood building industry, included recycling, finance, universities and research institutes. Our industrial companies have approximately 16.000 employees and an annual turnover of 28 billion NOK.

Would you like to join our network on circularity?

Contact
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2022: The first of many useful workshops organized on finance and sustainability, where the forest industry and R&D shared insight and knowledge. Photo: Norwegian Wood Cluster

A guide to sustainable reporting for wood-based industry was developed within SirkTRE and has been of great use to large and small companies.

NORWEGIAN WOOD CLUSTER

THE FUTUREBUILT CIRCULAR

Criteria for Circular Buildings provides a structured and measurable approach for promoting circularity in construction. It defines clear standards for how buildings should be designed, built, rehabilitated, or demolished in order to preserve material resources and reduce environmental impact.

At the heart of the criteria is the FutureBuilt Circularity Index, a tool that quantifies the degree of circularity in a building based on material flows. The index emphasizes actions such as preservation of existing structures, reuse of building components, use of surplus and recycled materials, and design for future reuse or recycling. Projects are required to achieve a minimum percentage of circularity, which increases over time in line with long-term climate goals.

The criteria also include additional requirements: ensuring specialist competence in circular practices, minimizing waste during demolition and construction, designing buildings for future adaptability, and applying circular solutions across a wide range of building elements.

Overall, the criteria set establishes a forward-leaning standard for resource-efficient, low-emission buildings —pushing the building sector toward a fully circular built environment by 2050. In the photo you can see Mattis Sveinhaug making a cordwood wall from stumps of discarded barn materials and clay mortar.

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FUTURE BUILT

VILL ENERGI

SUSTAINABLE CONSTRUCTION

Consultancy

Vill Energi is a small, dynamic consultancy specializing in strategic and environmental sustainability, where our goal is to ensure that strategy and action lead to real, positive impact. We are proud to be part of the management in SirkTRE, where we hold a key role in developing pilot projects that foster markets for circular value chains for reused wood materials.

Our team consists of eight enthusiastic and highly skilled advisors with complementary experience in strategy and engineering. We have a broad understanding of environmental impacts, in aspects related to climate, nature and people. We bring a holistic approach to sustainability in every project, where financial risks and opportunities are considered.

Vill Energi is specialized in the building sector, urban development and industrial transformation. Vill Energi has as well contributed as a key resource in some of the SirkTRE innovation projects with partners such as Holar, Fragment, Grape and several FutureBuilt initiatives.

Below we list the services we offer within specific service areas:

Environmental and Nature Services. Energy efficient solutions and optimization, nature risk analysis, climate services, GHG-calculations and circular economy.

Strategy and Compliance. Sustainability and strategy reporting, double materiality analysis, EU taxonomy and CSRD/VSME.

Research, Development, and Industrial Innovation: Industrial symbiosis, knowledge sharing, and innovation and research projects.

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VILL ENERGI

SIRKTRE KATAPULT

Omtre | Urda Ljøterud Høglund

The SirkTRE KATAPULT project, led by Omtre in collaboration with NTNU, links the SirkTRE consortium with MTNC's Catapult Centre to accelerate testing of new ideas. From 2021 to 2025, the aim is to connect at least ten timber-related innovations each year to the Catapult programme.

Objectives

Share Technological Advances. New findings are continuously shared with SirkTRE partners and external collaborators, building an open knowledge network where all stakeholders benefit. Create a Digital Workflow. We extend Building Information Modeling (BIM) beyond design to cover:

- Raw Material Mapping: Reclaimed timber is 3D scanned to create BIM models.
- Automated Production: BIM data is transferred to CNC machinery, enabling more efficient and precise construction —especially for bespoke structures.

Establish a Testing Centre. As part of SP4.5, a shared test lab at NTNU Gjøvik was developed with MTNC. It provides access to advanced equipment, lab space, and technical expertise for prototyping and simulation.

Pilot Projects (2022–2024)

Timber Scanning: 3D scanning of reclaimed timber fed directly into BIM, then used for automated cutting. This method reduced lead time by 15% over manual measurement.

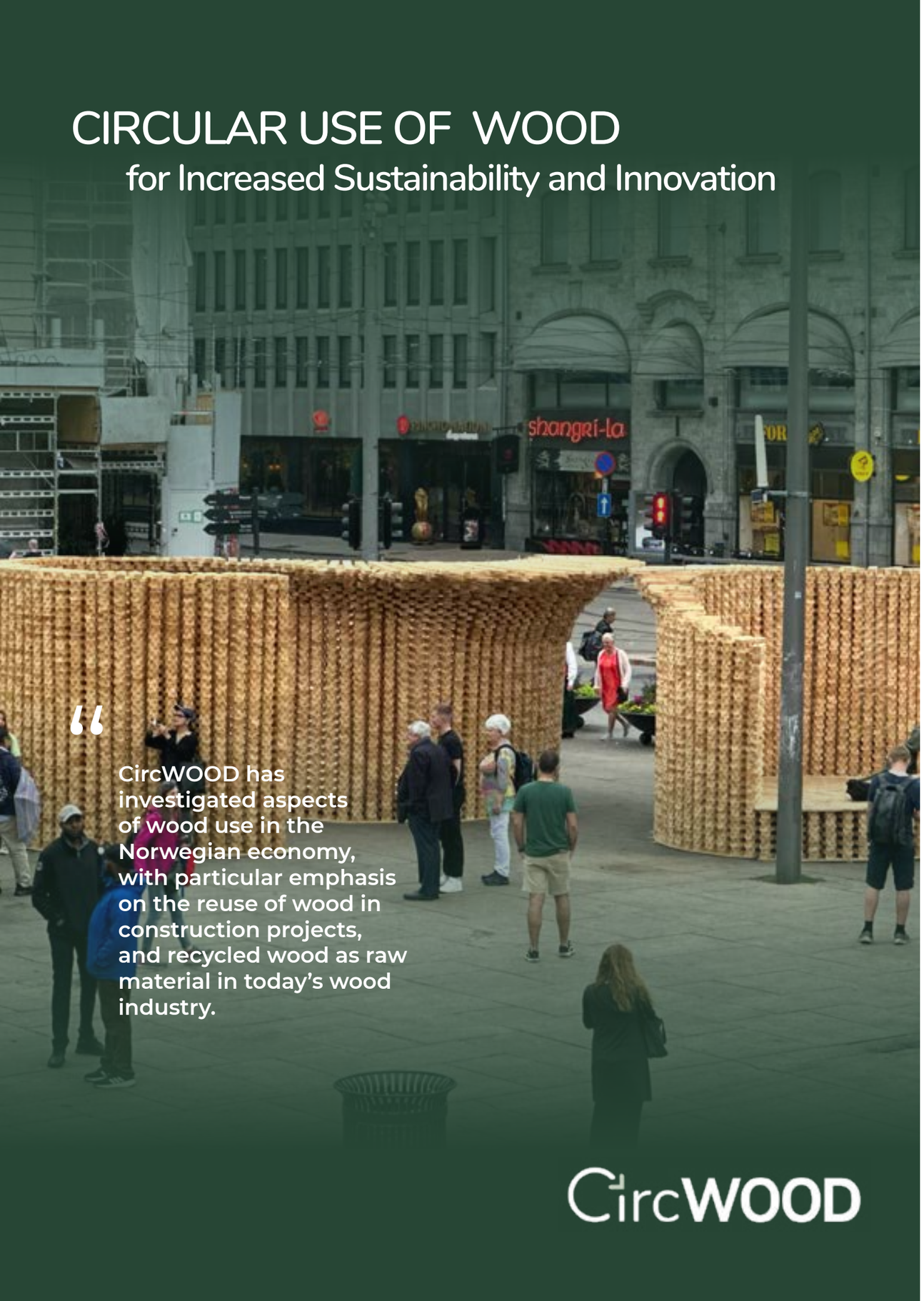
Robotized Assembly: A robotic arm assembled prefabricated timber beams based on BIM data, reducing on-site work by 20%.

Knowledge Sharing

Newsletters and blog posts document developments, helping engage partners and recruit new participants, including students and professionals. Catapult centres like MTNC at NTNU offer industry access to equipment, labs, and expertise. Through SirkTRE KATAPULT, participants benefit from:

- Rapid prototyping
- Expert support
- Strong national and international networks

MANUFACTURING TECHNOLOGY | NORWEGIAN CATAPULT CENTRE NTNU OMTRE siva



CIRCULAR USE OF WOOD

for Increased Sustainability and Innovation

CircWOOD has investigated aspects of wood use in the Norwegian economy, with particular emphasis on the reuse of wood in construction projects, and recycled wood as raw material in today's wood industry.

CircWOOD

EXCERPTS OF PRESENTATIONS

Nore, K. Establishing Reclaimed Timber in Norway, SlowWood Seminar, København, Denmark	23.11.2025
Årskonferansen SirkNorge, Gardermoen, Norway	24.09.2025
Nore, K. SirkTRE - establish the fully circular value chain for wood Grønn Plattform	18.09.2025
Regulatory barriers to the circular economy, Innovasjon Norge, Oslo, Norway	
Nore, K. Not straight forward wood.COPVestland, Bergen, Norway	19.08.2025
Nore, K. Its not straight forward. Week of politics, Arendal, Norway	11.-14.08.2023
Nore, K. Do we need circular timber?	22.-26.06.2025
Nore, K. Can SirkTRE consortium facilitate for 8% of the Norwegian Paris climate obligations with their circular solutions? WCTE - Brisbane, Australia	1.-3.06.2025
Nore, K. Findings from SirkTRE case projects Circular Building Sector Conference, Lund, Sweden	28.08.2025
Nore, K. What have we achieved through standardization in SirkTRE? Standard Norge, OsloMet, Oslo	07.05.2025
Nore, K. How can wood become more circular? Sirkulærkonferansen Asker, Norway	25.02.2025
Nore, K. Circular timber, Waste in the construction sector, NHO, Oslo, Norway	15.01.2025
Ross, L. Circular use of wood for increased sustainability and innovation. Sustainable Urban	05.12.2024
Futures – Seminar by GreenSmart, NMBU Sustainability Arena. Ås, Norway.	23.11.2024
Nore, K. The circular wood industry - current developments and implecations Forum Holzbau, Innsbruck, Austria	12.11.2024
Nore K. Wood reuse: unique potential for reducing carbon in construction- Byggenæringens klimakonferanse, Oslo Rådhus, Norway	07.11.2024
Nore, K. Circular wood gives imediate reuction of climate fas emissions	23.10.2024
COP29 i Baku, Aserbajdsjan	
Nore, K. Reclaimed timber - business portunity Innovawood, Brussel, Belgium	22.10.2024
Klimapartnerskapskommuner, Nedre Sem	
Modaresi, Roja. Advancing Circular Wood Use: Key Insights from the CircWood Project, poster presentation at the 20th Annual Meeting of the Northern European Network for Wood Science and Engineering, WSE2024, Edinburg, UK.	07.06.2024
Eriksen, A.,Jørgensen, P. F., Nore K. Closing Rammeverk, Fragment, Byens Tak, Osl, Norway	14.05.2024
Modaresi, Roja. CircWood and the possibility for European collaboration.InnovaWood General Assembly meeting, Prague, Czech Republic	13.05.2024
Ross, L. and Nore, K. SirkTRE/CircWOOD – increasing knowledge with a Green Platform project. Seminar Norwegian Environment Agency. Presentasjon Oslo Met	26.04.2024
Jørgensen Per F. Low-emission materials, Del&Lær Futurebuilt, Oslo, Norway	11.10.2023
Wuyts, W. Digital technologies for a re-sawmill. The 1st Live DiCE Lab seminar, organized by TU Delft & ETH Zurich. Delft, the Netherlands.	21.09.2023
WCTE - Oslo 2023 - seminar and 6 presentations	18-22.06.2023
Nore, K. PEFC - How can the Nordic construction industry move towards greater circularity, Webinar	23.03.2023 02.02.2023
Hanssen, Mathias Røed. LCA Scenarios for wood reuse – Issues related to the standardisation of wood reuse from an LCA perspective. Status and information meeting on standardisation work within climate and environment.Webinar by Treindustrien og NHO	
Thorkildsen, Tom Erik. KCarbon effects over time – New climate policy, new opportunities in the forest sector. Status and information meeting on standardisation work within climate and environment. Webinar by Treindustrien og NHO	02.02.2023
Larnøy, Erik. CircWOOD. Presented at Circular Hot Spot, Prague, Czech	31.10.2022
Modaresi, Roja og Johann K. Næss. circWood/sirkTre i Standardisering klima og miljø-statusmøte i NHO, Oslo	06.09.2022

RESEARCH INSIGHTS FROM THE CIRCWOOD PROJECT

Through interdisciplinary collaboration, the CircWOOD project investigates how post-consumer wood (PCW) can be reused and recycled in construction and manufacturing, supporting climate goals and industrial innovation. Five work packages (WPs) contribute insights, from mapping material availability to assessing market and environmental impacts, supporting standardisation, policy, and sustainable practices.

WP1: Mapping availability and quality of reclaimed wood

This work package provides the empirical foundation for the CircWOOD project. Its primary objective is to map, model, and simulate the availability and quality of PCW in Norway. The work includes field studies, waste fraction analyses, and material testing to assess the suitability of reclaimed wood for use in structural timber, glulam, cross-laminated timber (CLT), and wood-based panels. In one study, more than 50 tons of post-consumer wood from Norwegian recycling stations were analysed, and the findings revealed that a significant portion is load-bearing and untreated solid wood, which has good potential for reuse and recycling. This highlights the need for proper sorting to manage preservative-treated materials and fiberboards, and notes that industrial customers generally deliver higher-quality wood than households. Material testing has shown that reclaimed timber can meet performance requirements for structural applications, although variability in geometry and adhesive ageing must be managed. Reclaimed wood chips have also proven viable for particleboard production, though quality varies by source. These findings support the development of classification systems and guidelines for timber recovery and recycling. Further, a study has been performed to refine the methods for estimating the material intensity in timber frame stud walls by incorporating building characteristics and regulatory changes. These data on material intensities will feed into a building stock model to enable a more accurate estimation of wood volumes stored in the built environment.

WP2: Digital tools for circular wood management

WP2 develops digital tools to support circular wood flows, creating a semi-automated method for generating BIM models of existing timber buildings. These models form the basis for digital twins and digital product passports (DPPs), enabling tracking and tracing of timber elements throughout their lifecycle.

The CircWOOD Digital Twin platform operates at two levels: macro, with a GIS-based tool visualising wood stocks, material flows, and impacts at regional and national scales; and micro, enabling detailed tracking of reclaimed wood within buildings and infrastructure projects. Blockchain-based traceability ensures data integrity and regulatory compliance, connecting with DPPs.

These tools provide transparency, support compliance, and enable data-driven decision-making for public and private stakeholders.

WP3: Modelling the wood sector and market impacts

WP3 assesses how wood cascading strategies affect demand, economic performance, and environmental impact, using the Nordic Forest Sector Model (NFSM). Scenarios include PCW use in particleboard production and sawnwood consumption. The model estimates market responses to wood recycling changes, including impacts on harvesting volumes, biomass, transport needs, and carbon storage, as well as socio-economic costs and benefits.

A coordinated Nordic-Baltic recycling policy would reduce logging in Norway more effectively than a unilateral national policy, though "leakage effects" toward adjacent markets can limit individual countries' benefits. Preliminary results show that while the annual climate impact of wood recycling is modest, it accumulates to significant levels over decades. These insights are crucial for designing effective and equitable recycling policies, highlighting regional coordination and long-term planning.

WP4: Environmental impact of cascading wood use

WP4 investigates environmental implications of cascading wood use, ensuring efficient use across multiple life cycles. Developing a dynamic MFA model integrates data from other WPs, tracing wood from forests to buildings to recycling, visualising carbon flows and environmental trade-offs. The model supports digital tools from WP2 and informs strategic roadmaps in WP5.

WP4 explores carbon sequestration in harvested wood products (HWP), analysing reused wood's contribution to long-term climate mitigation. Further, a study has been performed to refine the methods for estimating the material intensity in timber frame stud walls by incorporating building characteristics and regulatory changes. These data on material intensities will feed into a building stock model to enable a more accurate estimation of wood volumes stored in the built environment. Collaboration is central to WP4's success, with regular PhD meetings and coordination across work packages. WP4 illustrates interdisciplinary collaboration and advanced modelling informing policies and practices for a circular wood industry in Norway.

WP5: Framework, Scenarios, and Roadmaps for the Future

WP5 identifies opportunities and obstacles for wood reuse in construction, examining current regulations and decision-makers' views through surveys and interviews. Scenarios represent paths forward for increased reuse, compiling results into a roadmap.

A policy analysis revealed that six out of 70 proposed instruments have been implemented, insufficient for establishing circular value chains. Surveys of housing developers and builders indicate positive outlooks on reused wood materials, driven by perceived advantages, material access, information, and supportive frameworks. A survey of over 900 individuals found more than half are positive about using recycled wood in homes, preferring materials suitable for modern lifestyles or traditional charm, technically fitting with houses. Concerns about nature loss or climate change did not affect willingness to buy reused materials. Municipalities surveyed about their experiences and plans for using recycled construction materials cite material access, knowledge, and collaboration with contractors as crucial factors.

Photo: Kathrine Torday Gulden, NIBIO

Work package leaders
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References
A updated reference library can be found on NIBIO's CircWOOD dissemination web page or follow the QR code.

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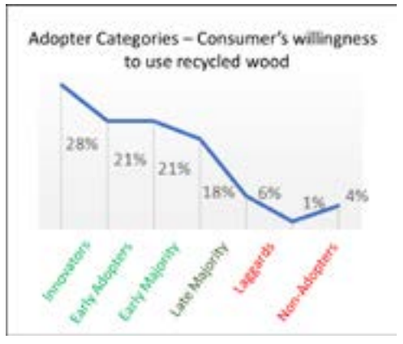
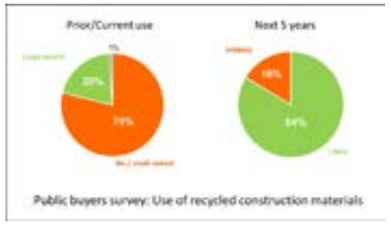
DECODING THE CONSUMER MINDSET

Research about acceptance of circular wood reveals that end-consumers are very willing to use it in new construction and renovation of their timber houses. Is it because they are super environmentally conscious...?

Consumers play a crucial role in the building sector' transformation from a linear economy into a circular one. However, consumer attitudes remain largely unexplored and often associated with caution and negativity. CircWOOD's WP5 set out to investigate if consumers are ready to adopt recycled wood in their houses. Digital surveys of 467 house-owners and 446 cabin-owners in Norway, administered by Norstat AS, revealed market optimism in using recycled wood for new construction and renovation. Applying adopter categories from Diffusion of Innovations theory shows that almost half the consumers are innovators or early adopters (Image 1). The study also evaluated reasons for this openness from consumers to adopt recycled wood into their homes. Results of path analysis highlighted relative advantages over fresh wood such as recycled wood's traditional charm, and compatibility with existing building materials as highly influential reasons.



To our surprise, consumers' environmental values and risk concerns had very limited effects in their willingness to adopt recycled wood products. Builders and contractors can keep these findings in mind when convincing their clients.
This research was followed by a survey of another important consumer group: the public buyers. 104 municipalities in Norway were reached out, via telephonic surveys by Norstat, for their viewpoints on incorporating recycled construction materials in public procurement. Survey results revealed that most municipalities had no or little previous experience with such material. But a large majority were expecting to use them in the next five years (Image 2). This future optimism was positively influenced by the municipality size, increasing population projection and prior good experience. This implies if public buyers are made to use recycled material once, they are likely to have a positive experience and are likely to use it again. Policymakers are advised to develop pilot projects in larger municipalities in Norway to trigger further use. The survey also explored reasons that could motivate public buyers to make circular building material a part of their tender process.



Economic incentives, such as national grants and cheaper prices of recycled materials compared to fresh materials, were top-ranked enablers. Infrastructure improvements, such as assurance of reliable supply, better product information dissemination and close cooperation with suppliers and contractors, are deemed as the second most important category. However, regulation changes, such as local GHG reduction targets and limits, were ranked lower. National government should facilitate funds and establish infrastructure so that recycled materials can become a regular criterion in the procurement of construction products.

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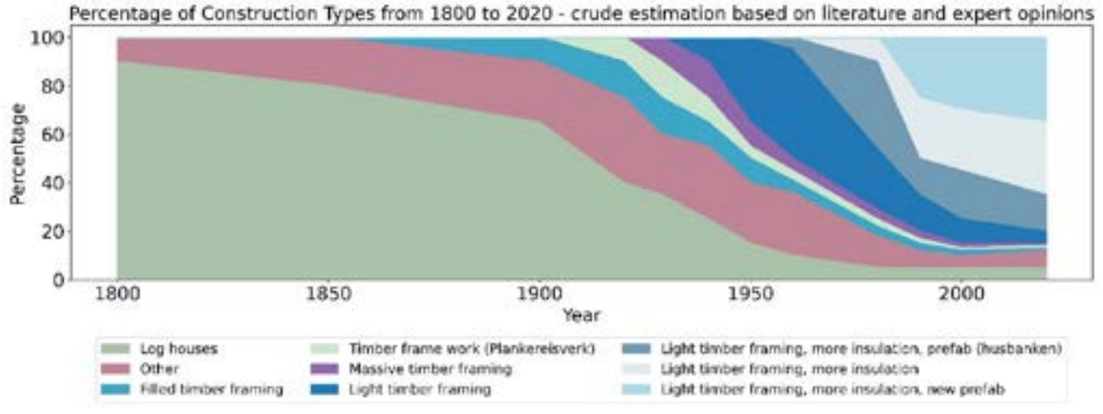
WOOD IN THE NORWEGIAN BUILDING STOCK

Reusing and recycling wood can help mitigate greenhouse gas emissions, spare virgin resources, and prevent biodiversity loss. In Norway, over 60% of post-consumer wood originates from the construction sector and private households (Statistics Norway 2024).
Detached dwellings, the predominant housing type, are largely constructed from wood (Bache-Andreassen 2009). With increasing political momentum supporting wooden buildings, the future holds a stable supply of post-consumer wood as buildings undergo renovation, demolition, and deconstruction.

To plan for the circular use of wood, it is important to gain an understanding of how much wood there is in the building stock and estimate annual future releases. Dynamic material flow analysis, also known as dynamic stock modelling, is a well-established methodology for quantifying materials in the current building stock and forecasting future outflows. As a part of CircWood's Work Package one, we are developing a dynamic stock model based on the human needs for living spaces, population projections, and building lifetimes, as first introduced by Müller (2006).

In the model, we include various construction types for detached dwellings, as material quantities differ significantly depending on the construction method. For example, log houses and light timber frames exhibit substantial variations in material use. The construction types are developed for detached dwellings, because 54% of the population lives in detached homes (Statistics Norway 2025), and because this building type represents the largest share of gross floor area.
Experts on timber construction were consulted to determine which construction types to include for each period. A crude estimation for the percentage of different building types is given in Figure 2. Until the 1900s, log houses dominated as the primary construction method, whereas after the 1950s, light timber framing replaced more material-intensive building techniques. The final model will be available in a scientific paper by the end of the CircWood project.



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NEW VALUE CHAINS New Opportunities

Cascading: a strategy to systematically use resources at their highest potential quality level, for as long as possible, as many times as possible, can allow for reduced logging and increase substitution of concrete, steel and plastics. According to 2023 FAOSTAT data, Norwegians dispose 146 kg of post-consumer wood per capita, second most in Europe after the Swedes. A survey carried out by CircWOOD's package 1 showed that the composition of Norwegian post-consumer wood is comparable to other European countries, but has larger proportions of untreated solid wood, which has a great cascading potential.

By following the cascading strategy, we may assume that it is technically feasible to reuse and remanufacture (clean, plane, and finger-joint) sawnwood corresponding to 40 percent of generated post-consumer wood. Unlocking the full potential is tremendously challenging and could at best replace a third of domestically produced sawnwood.

The next 50 percent of the post-consumer wood can be converted into recycled wood chips that may replace half of the fresh chips in particleboards. New sorting technology has made this recycling process more manageable and may release more than twice the amount used in domestic production today. The potential abundance of recycled chips can either be met through increased exports to large producers abroad, or by increasing domestic particleboard production. A third option could be to promote products that utilize post-consumer wood unsuited for sawnwood, yet too good to chip.

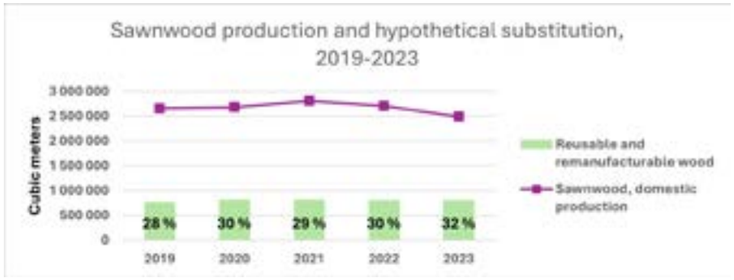

Figure 1: Purple line illustrates the domestically produced volumes of sawnwood. Green columns illustrate how large proportions that could potentially be substituted by reused and remanufactured sawnwood. Cubic meters of sawnwood production are retrieved from FAOSTAT.

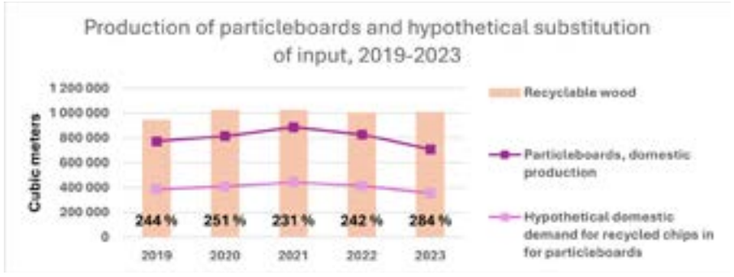

Figure 2: Dark purple line illustrates domestically produced volumes of particleboards. Light purple line illustrates the hypothetical demand for recycled wood chips from domestic particleboard producers. The light orange columns illustrate available amounts of recycled chips as a proportion of hypothetical demand. Cubic meters of particleboard production are retrieved from FAOSTAT and adjusted to compensate for compression.

In work package 3, we implement the feedback loop for recycled wood products in a complex economic input-output model that includes prices and volumes of harvest, production, and trade for most forest-based products in the Nordic-Baltic countries. This allows us to simulate how changes in recycling levels and the introduction of different policy measures will affect activity in all parts of the forest sector, and to ultimately inform stakeholders and policy makers about opportunities and challenges ahead.

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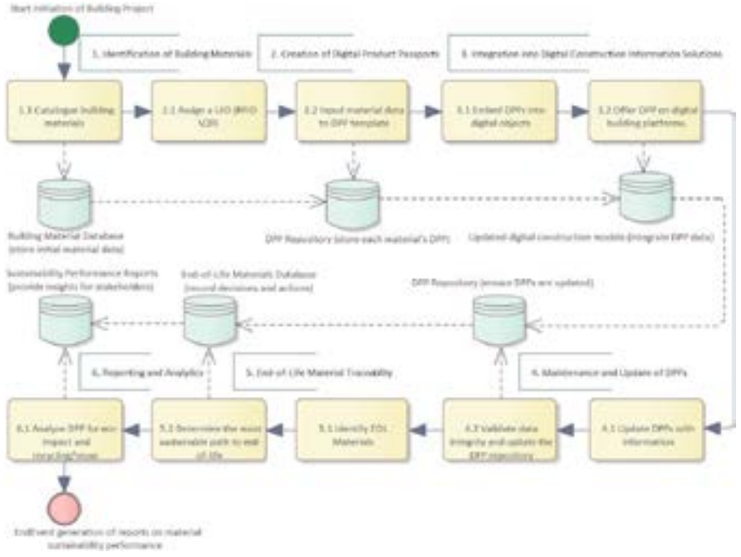
DIGITAL PRODUCT PASSPORTS
for Wooden Building Materials

The project aims to develop digital product passports (DPPs) for wooden building materials to ensure traceability, enable industrial reuse, and support a shift toward a circular construction industry.

A DPP is an electronic document that confirms a product's ownership and authenticity. It promotes circular economy principles, supports sustainable growth, and enhances transparency through structured data and shared information across the product's lifecycle.



A wooden window was used as a case study to identify the key data a DPP should include. Data about the product, manufacturer, installation, maintenance, and end-of-life is stored in the DPP. The window is tagged with an RFID chip or QR code, which can be scanned by a reader. This data is sent to a database (e.g., blockchain or SQL), enabling tracking and decision-making about reuse, recycling, repair, or disposal.

DPPs support lifecycle management by cataloguing materials with unique IDs. Figure 2 outlines how DPPs are managed through a building project —from initial identification, data input, and storage, to integration into digital models and platforms. The DPPs are continuously updated, helping identify the most sustainable end-of-life options and enabling sustainability reporting.

Construction faces significant challenges related to waste and resource use, especially with wood. A major barrier to reuse is the lack of documentation on a material's origin and properties. Without clear, reliable data, reuse is risky and costly. DPPs address this by ensuring traceability and lifecycle insight. This project develops methods to link DPPs with wooden materials. The passports contain information on product origin, properties, environmental impact, certifications, usage, and recycling guidance, all in a standardized digital format for easy access and decision-making. Using Building Information Modelling (BIM), digital twins, and open data standards, DPPs are embedded into actual building components. The work includes defining data needs, creating a DPP template based on standards, pilot testing with industry partners, and evaluating integration in construction workflows — especially during renovation, deconstruction, and reuse.

Challenges include inconsistent data quality due to varying digital maturity across suppliers. Interestingly, many stakeholders already hold valuable information —they just need tools to organize and access it. A promising sign is the strong collaboration between research, construction, and tech sectors. Pilot tests show that DPPs are technically feasible and welcomed by the industry.

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TRACKING TIMBER

A Digital Strategy for Circular Construction

How can we ensure that building materials like timber are reused instead of becoming waste? How can we develop design tools that support architects, policymakers, and demolition companies in designing for reuse and making informed decisions? This project explores how digital tools can help identify and track materials—from the urban scale down to individual building components—focusing on timber as a renewable and circular resource.

The construction industry generates vast amounts of waste and greenhouse gas emissions. At the same time, the growing demand for new living spaces puts pressure on raw material resources, availability, and prices. However, many materials —especially timber —are discarded long before the end of their useful life. We need better systems to understand what buildings are made of and how to give these materials a second life.

We propose a set of tools and methods to accelerate the circular transition by semi-automating the creation of high-granularity BIM models for existing buildings. These models are enriched with information about material provenance, reuse potential, recycling factors, and material densities.
An integrated BIM plugin automates the calculation of embodied carbon, waste, potential recycled material, and circularity index scores for each building component. Semantic web technologies are used to integrate additional information such as building type, geospatial location, and construction period. This data is delivered through a web application that enables dynamic exploration of the building stock—from city and district levels down to individual components.

Combining BIM, semantic web technologies, and urban-scale data enables more precise and scalable tracking of materials like timber, supporting better design and policy decisions for circular construction. While aligning data from diverse sources remains a challenge, the benefits are clear: greater transparency, actionable insights, and a shift toward designing buildings with reuse in mind.

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MINTRE – MINIMIZING WOOD WASTE ON CONSTRUCTION SITES

MinTre (2022–2027) is initiated by private companies and aims to reduce wood waste on construction sites by 40%. The research focuses on where and why waste occurs, and what can be done to reduce it.

In 2020, ØMF disposed of over 2000 tons of wood waste from its construction sites. In collaboration with industry, academia, and researchers, causes of wood waste and interventions to reduce it are being mapped, with goals of environmental, health, and financial benefits.

MinTre is a cross-disciplinary project with partners ØMFjeld, Sør-Odal Municipality, Link Arkitektur, Multiconsult, OMTRE, Optimera, SINTEF, OsloMet, and Klosser Innovasjon. The research includes data collection and system boundaries to compare different waste overviews from relevant projects. Participants' roles, responsibilities, and influence form the system boundaries for developing and testing interventions.

Data from case buildings show nearly half the wood waste came from temporary structures, and a similar amount from packaging waste —previously blind spots. The mapping reveals that construction planning is divided into "silos" with different responsible actors. Each silo closes its delivery before passing it on, making each party responsible only for its part and minimizing handover risk. This can hinder influence on earlier phases and complicate best practice implementation. Many involved actors affect waste streams —and solutions.

The project continues toward 2027, aiming to test interventions on construction sites to create lasting system change.

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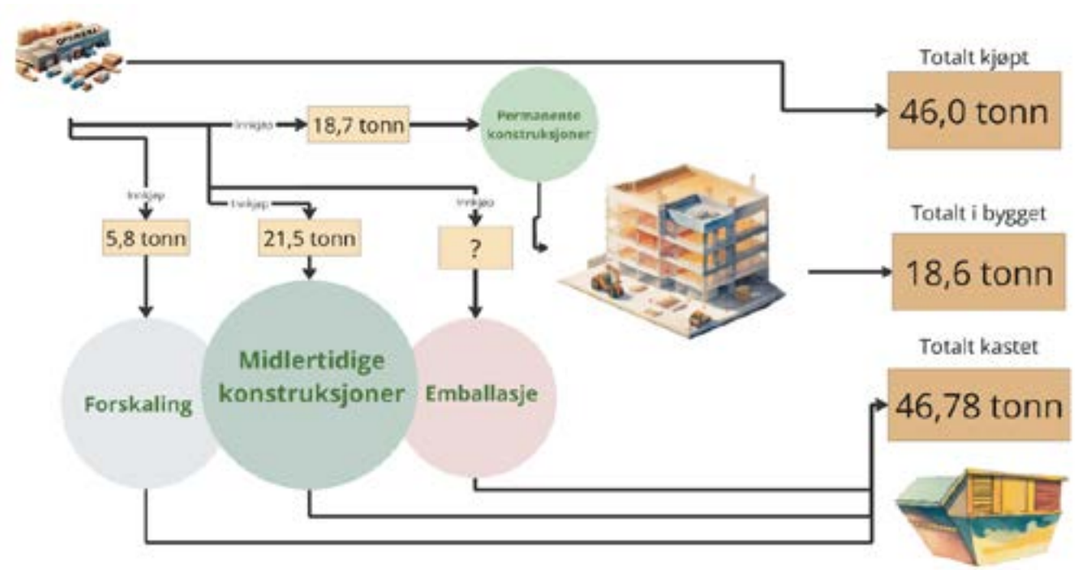

CONTINUING SIRKTRE - CIRCULESS - HORIZON EUROPE - GEORGIOS TRIANTAFYLLIDIS

UPCYCLING MINERAL AND TIMBER-BASED WASTE

from construction & manufacturing process industries

Construction and demolition waste (C&DW) accounts for more than 30% of all waste generated in the EU, reaching approximately 450-500 million tonnes annually: in terms of volume, it is the largest waste stream in the EU across all industrial sectors.

Timber material generates a tremendous amount of waste annually from building element manufacturing, construction, demolition, and renovation, while only part of it is currently being recovered, with high variability per country.

CIRCULess targets on fostering circularity in the construction and manufacturing process industries, by minimizing Construction and Demolition waste (C&DW) as well as Manufacturing waste (MW), with a focus on mineral and timber-based material streams, by developing new processes for circularity of secondary materials from wastes/residues for all industrial processes, without compromising quality and performance as well as sustainable-by-design circular products. CIRCULess project will experiment with new circular products and processing techniques to improve the quality and performance of secondary materials up to industry standards and improve environmental friendliness. These actions will be supported by a tailored digital platform for waste management, orienting decision-making & operation, while recommendations for standards updates and relevant training material for both upskilling and training will be created.

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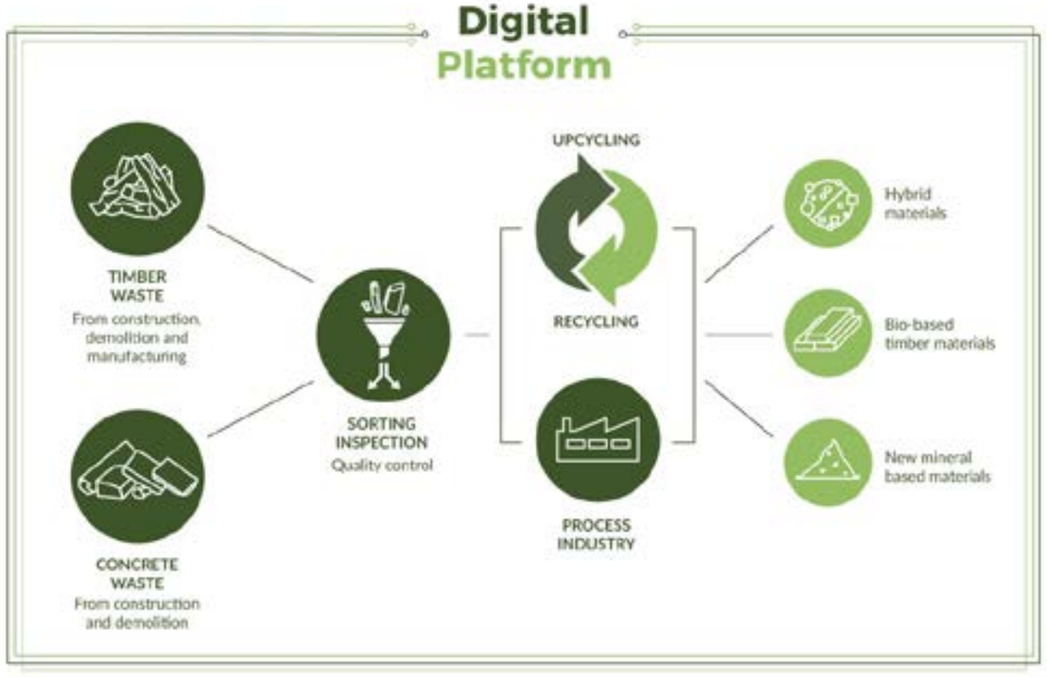

CONTINUING SIRKTRE - RAW - EIC PLATFORM - WENDY WUYTS

COMPUTATION FOR A NEW AGE OF RESOURCE AWARE ARCHITECTURE:

Waste-Sourced And Fast-Growing Bio-Based Materials

RAW is a European project, funded by the European Innovation Council (EIC), that rethinks how we design and build with natural and bio-based materials.
Instead of seeing the natural variation in waste-based or fast-growing materials as a problem, RAW turns it into an opportunity. The goal is to create smarter ways of working with these materials so they can play a bigger role in the future of sustainable construction.

The project brings together top experts in:

- Material sourcing – finding new uses for waste and fast-growing materials
- Material testing – developing non-destructive ways to understand and classify resources
- Computational design – creating design methods that adapt to material variability
- Fabrication – developing flexible production processes that reduce waste
- Environmental impact assessment - creating frameworks assisting architects and designers in their early design and planning phase to reduce their negative impacts

For architects and developers, RAW opens the door to:

- New material options that were previously overlooked
- More efficient use of resources, reducing waste and cost
- Circular construction methods that store more carbon and support sustainability goals
- Fresh design possibilities, with new aesthetics and tectonics born from these materials

In short, RAW is building the foundation for a resource model that links design, analysis, and fabrication in one system, helping the AEC industry move faster toward circular, low-carbon construction.

Who is in RAW?
The RAW consortium brings together leading universities and research institutions across Europe, including CITA at the Royal Danish Academy (project lead), the University of Innsbruck, Luleå University of Technology, TU Denmark, the University of Leiden, Taltech, and the University of Stuttgart, combining expertise in material sourcing, testing, computational design, and adaptive fabrication. Among them, OMTRE A/S is the sole industry partner, contributing its extensive know-how in circular wood solutions and ensuring that RAW's research connects directly to real-world construction practice.

Do you want to learn more?
The project has a very rich website, with blogposts, a list of resources (open access papers, reports, tools) and more information see qr code. The project is also active on Instagram and LinkedIn.

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WOODSTOCK

Climate-smart use of wood in construction

“Empowering climate-smart, circular, and zero-waste use of underutilised wood from the forest and building stock in the construction sector to support the New European Bauhaus.”

WoodStock is a four-year-long research project funded by the European Union under the HORIZON-CL6-2024 CLIMATE-01-5 call. There are 13 project partners in the project, including University of Gent, The Norwegian University of Science and Technology, The Norwegian Institute of Bioeconomy Research, Delft University of Technology, TUD, InnoRenew, Aalto University, University of Bordeaux, WETA, University of Galway, Łódź University of Technology, Innovawood, European Woodworking Industry Confederation CEI-BOIS, The University of Primorska from France, Belgium, the Netherlands, Finland, Poland, Slovenia, Ireland, and Norway.

The project aims to quantify and map underutilised wood resources in Europe through material flow analysis (MFA), to set up a robust dynamic LCA method to analyze environmental, social, and economic impacts, and to develop circular and zero-waste solutions grounded in the New European Bauhaus (NEB) values. A WoodBook will be created based on the circular and zero-waste solutions. The WoodBook offers an open-source digital catalogue offering practical and eco-friendly solutions for architects, designers, and construction professionals. The project aims to establish a European Wood Construction Observative, a platform on wood-related topics based on a Large Language Model AI tool.

The project’s ambitions include providing a holistic framework for policy, innovation, and market development, based on Co-Creation and World Café workshops in six different living labs. This will result in a roadmap with policy recommendations and business strategies to expand the wood construction sector sustainably.

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“SirkTRE has taken new steps to increase the reuse of wood instead of burning it. This requires pioneers who test and explore new approaches to discover opportunities and also consider how they can be commercialized, even in an immature market.

Many of us in Sweden have followed your innovation environment with interest, seeking inspiration for what is possible to do to reduce the incineration of wood.”

MAGNUS FALK
Projektledare, RISE Research Institutes of Sweden

“Increased use of wood in construction can be a key element in the green transition of our societies. Of all the major construction materials, wood is the only renewable one. The better we get at recycling and re-using wood, the longer we can make resources last – to the benefit of end-users, the construction sector, and the general society. Danish Technological Institute is proud coordinator of the European innovation project WOODCIRCLES (www.woodcircles.eu), which brings together the European wood construction value chain to innovate scalable technologies and design solutions for circular wood in construction.”

ANDERS KJELLOW
Centre Project Manager, PhD. Danish Technological Institute

“We humans borrow the Earth from our descendants. As a major consumer of resources, the construction industry has a responsibility to manage them in the best possible way. At Backe, we actively contribute to developing solutions for recycling materials from waste that cannot be eliminated or reused. We have helped increase material recycling for wood, concrete, mineral wool, and plastic pipes. We are proud to have achieved a 65% material recycling rate in 2024 and are aiming even higher in 2025.”

INGRID LILLEGRAVEN LINDSETH
Miljøsjef, Backe

PROJECT PARTNERS

SirkTRE

HUNTON Av naturen. For naturen.
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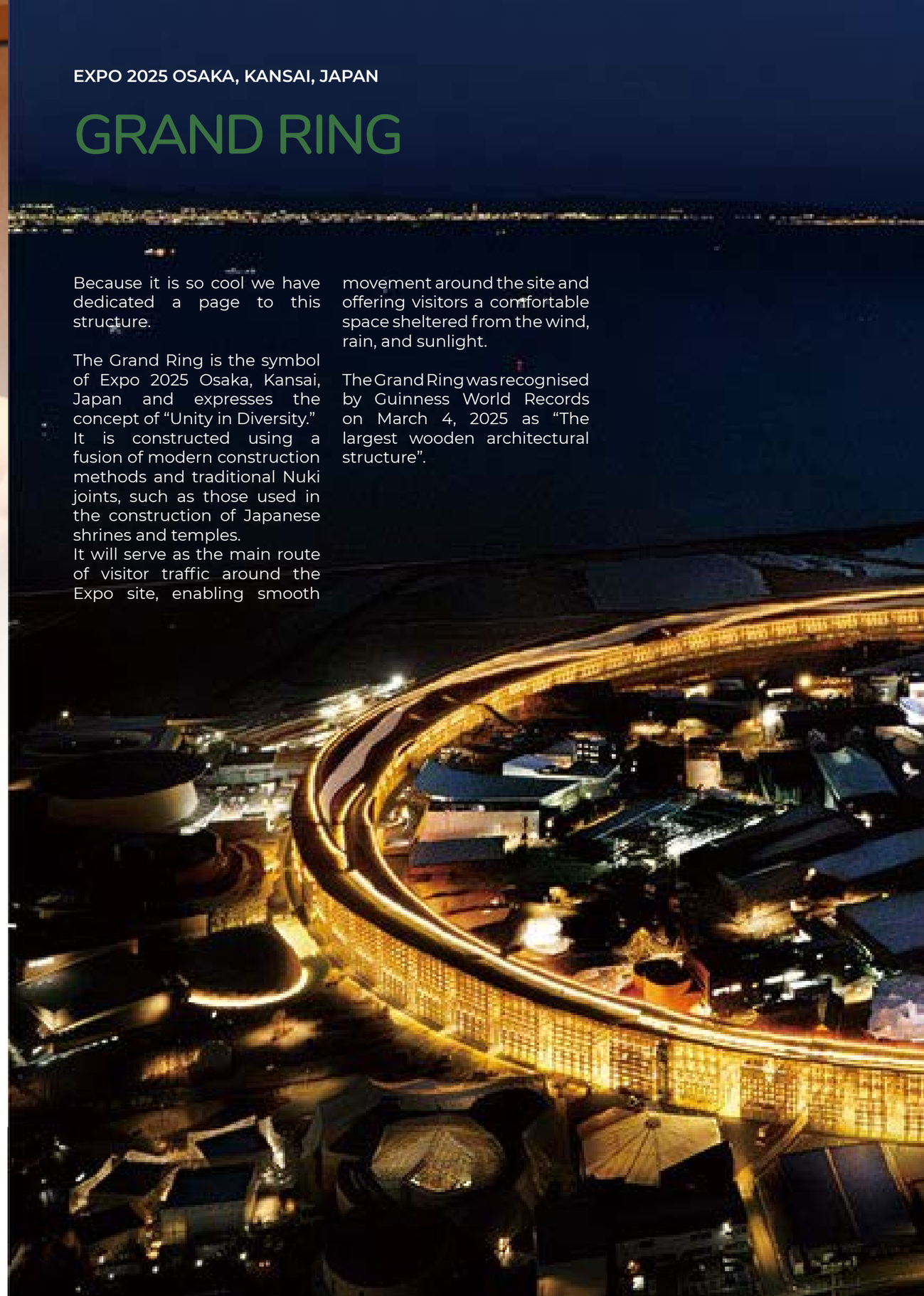
EXPO 2025 OSAKA, KANSAI, JAPAN

GRAND RING

Because it is so cool we have dedicated a page to this structure.

The Grand Ring is the symbol of Expo 2025 Osaka, Kansai, Japan and expresses the concept of “Unity in Diversity.”
It is constructed using a fusion of modern construction methods and traditional Nuki joints, such as those used in the construction of Japanese shrines and temples.
It will serve as the main route of visitor traffic around the Expo site, enabling smooth movement around the site and offering visitors a comfortable space sheltered from the wind, rain, and sunlight.

The Grand Ring was recognised by Guinness World Records on March 4, 2025 as “The largest wooden architectural structure”.



SirkTRE | CircWOOD

SIRKTRE'S CIRCULAR BUILDING PRINCIPLES

To help build in a more circular and sustainable way, SirkTRE has created these circular building principles.

1. Take care of buildings – it's never too late to rehabilitate.
2. Build according to need and flexibility, don't build more than necessary.
3. Plan the construction process, source local materials and suppliers.
4. Consider nature and climate, and adapt buildings to terrain and available resources.
5. Design buildings for maintenance, repair, disassembly, and reuse.
6. Share building materials and tools, preferably through open platforms.
7. Use non-toxic, renewable, and ideally used materials.
8. Handle building materials gently.
9. Save information about the building.
10. Think long-term - together!

Download here

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