Nordic Innovation

From Words to Action

Nordic Circularity Piloting Program for Technical Building Solutions

Contents

Cover photo: Dismantling HVAC equipment at Galleria Boulevard by Boulevardfastigheter, Kristianstad, March 2026, Caroline Jacobsson, Swegon

Foreword

This report concludes the Nordic Circularity Piloting Program (NCPP), a joint effort to move the Nordic building sector from talking about circularity in technical building solutions to proving how it can work in real projects. Over the course of the program, we have seen that when the right actors come together around a shared mission, circular solutions can be scaled faster and with more impact than any single organisation could achieve alone.

We extend our deepest thanks to **Nordic Innovation**, whose financial support and trust made this program possible. Their commitment to strengthening Nordic competitiveness and accelerating the green transition provided the enabling framework for everything that follows in these pages, from the first value chain sessions to the final pilots and recommendations.

The program was delivered by a strong Nordic consortium of core partners that covered the full value chain for technical building solutions. **Combient Pure**, as program leader, brought together and coordinated the partners and the wider ecosystem. **Cradlenet** led the policy work and helped ensure that the lessons from the pilots can influence the conditions for circular markets. **ASSA ABLOY, Demontera, KONE, Multiconsult, nolla_E, Skanska Sweden, Swegon** and **Vasakronan** contributed their expertise as manufacturers, property owners, contractors, consultants and circular service providers, and translated the program's ambitions into concrete pilots and solutions.

We are equally grateful to the program's steering group, whose independent guidance and constructive feedback helped shape the program from idea to completion. **Antti Ruuska (Green Building Council Finland), Ditte Lysgaard Vind (Bloxhub), Elin Bergman (Cradlenet), Erlend Seilskjær (FutureBuilt), Marika Määttä (Combient Pure)** and **Ulla Janson (Lund University)** brought together perspectives from research, networks, policy and industry practice.

At the heart of NCPP were the companies who chose to pilot new circular solutions in their own projects. Twenty-one companies from Sweden, Finland and Norway joined eight pilot teams to test circularity in HVAC systems, elevators, access systems, sanitary equipment and electrical systems. These companies acted as true pioneers in their respective segments and their work demonstrates that circularity in technical building solutions is not a distant vision, but a technically and operationally viable option here and now.

We also wish to thank all participants in the program's open activities – practitioners, experts, industry representatives, startups, students and policy makers all contributed by asking challenging questions, bringing in practical constraints, and co-creating solutions.

The impact of NCPP can be seen on three levels: a stronger Nordic ecosystem around circular technical building solutions, proven pilots that demonstrate feasibility across key product categories, and a set of concrete learnings and policy input to enable others to follow. Together, they show that circular solutions can reduce climate impact, extend product lifetimes, open new business opportunities and, crucially, be integrated into everyday practice in real building projects.

We hope that the insights, examples and tools presented in this report will support many more organisations in taking their own next steps. The transition to a low carbon, circular building sector is urgent – and possible. The work of the partners, steering group, piloting companies and wider participants in NCPP shows that when Nordic actors move together, we can set a new standard for how technical building solutions are designed, procured, used and kept in circulation.

Helsinki / Stockholm / Oslo, June 1, 2026

Picture: Final event of the Nordic Circularity Piloting Program, April 22, 2026

1

Introduction to the Nordic Circularity Piloting Program

1.1 Background

The building value chain accounts for nearly 40% of global carbon emissions and consumes more than 50% of global natural resources. [1] As energy systems decarbonise, the centre of gravity in construction emissions is shifting from the building use phase to the product phase [2]. Technical building solutions, the systems that supply a building with energy, water, indoor climate, mobility and access, constitute a major emission-intensive product category within overall product stage emissions [3]. It is also one of the least circular product categories today.

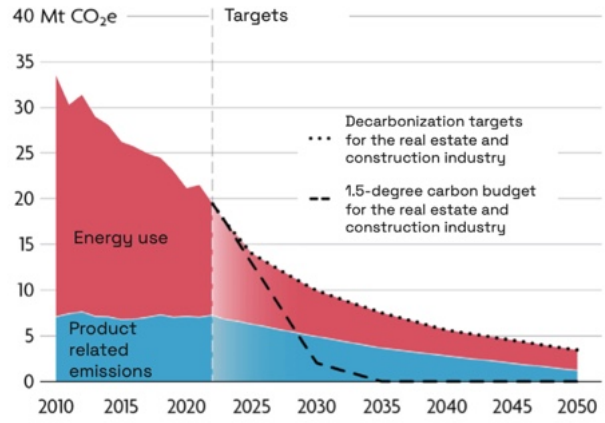

Figure 1: Shift in emission sources in the Finnish real estate and construction sector over the past 15 years [2]

A large share of the existing EU building stock is expected to undergo major renovation in the coming decades. [4] Even outside full renovations, tenant changes and interior upgrades constantly trigger replacements of HVAC components, elevators, access systems, sanitary equipment and electrical installations, often even before the products reach their functional end of life. The strategic opportunity is therefore not only in how to design new circular buildings, but more in how to keep technical solutions already in place in productive use for as long as possible. Done well, product reuse, refurbishment, remanufacturing, and smarter take-back and resale models reduce embedded emissions, extend product lifetimes, reduce lifecycle costs, and unlock new circular revenue streams across the value chain.

In 2022, Combient Pure, Vasakronan and KONE carried out a pre-study on circularity in technical building solutions. It mapped the current state and the most relevant circular strategies for technical building solutions, and confirmed that the product category was both underexplored and significantly important for the construction sector's climate impact. The pre-study also surfaced a

structural insight: technical building solution manufacturers had to be at the centre of the work. Without them actively designing for reuse, take-back, refurbishment and remanufacturing, the rest of the value chain would only be retrofitting circularity onto a linear product flow.

That insight shaped the next step. In 2023, Combient Pure, Vasakronan, ASSA ABLOY, KONE and Swegon came together in a first collaborative program to build internal circularity capabilities through practical working methods, peer-to-peer learning and customer dialogues across the value chain. The program made one further finding very clear: scaling circular solutions in this category requires multiple value chain actors to move together, and especially in construction, where contractors, sub-contractors, architects, consultants, product providers and end customers rarely come together early enough in the building planning phase.

The Nordic Circularity Piloting Program (NCPP) was launched in November 2024 to take this work into real building projects, supported by Nordic Innovation, and to gather the Nordic industry behind a shared, value chain-wide piloting effort. Between November 2024 and June 2026, NCPP brought together technical building solution manufacturers, property owners, contractors, dismantlers and consultants in eight pilots across Sweden, Finland and Norway, to test how circularity in technical building solutions can work in real buildings.

This report presents the insights and learnings from these pilots, and translates it into insights, opportunities and recommendations for the wider industry. It is written for industry operators exploring circularity for technical building solutions: manufacturers considering take-back and refurbishment offerings, property owners weighing reuse against replacement, contractors and consultants building new service capabilities, dismantlers and startups growing their business, as well as policy makers shaping the conditions for the market to scale.

Unless otherwise highlighted with brackets, the information in this report is drawn from the Nordic Circularity Piloting Program's documentation, including the program's application document, project status reports, pilot clinics, site visits, the two review sessions in March 2026, the final pilot survey of April 2026 and the final seminar on 22 April 2026.

"The need for a circular transition in the building industry is urgent. These pilots show how to move from just talking to actually doing, demonstrating some much-needed good examples, leading the way towards a circular building sector."

– Ulla Janson, Senior Lecturer, Installation and Air Conditioning Engineering, Lund University, steering group Member of the NCPP

1.2 Program structure

The program was structured in three phases, designed to raise the Nordic building industry's awareness and engagement in circularity, enable new partnerships for piloting new solutions, and finally execute multiple real-life pilots and gather action-oriented learnings from them. The phases one and three were open to the wider Nordic building industry, while phase two was dedicated to the selected pilot teams.

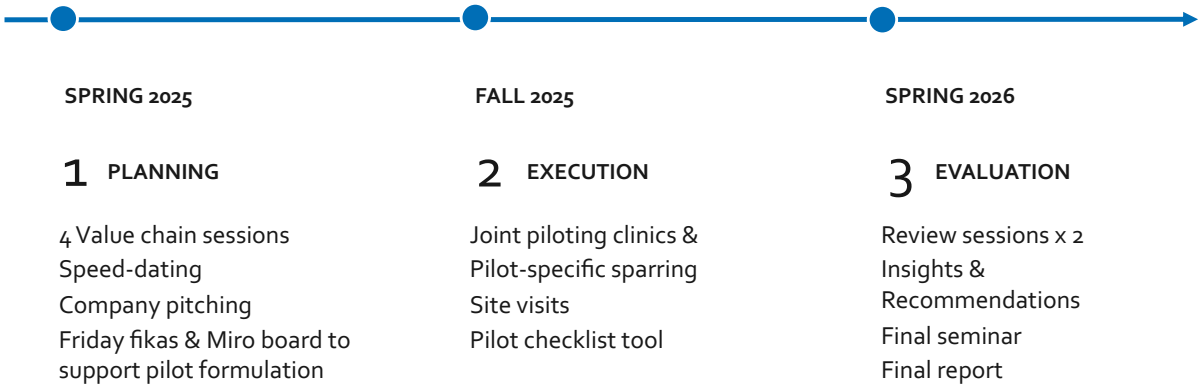

Figure 2: Timeline and phases of the Program

The planning phase (Spring 2025) focused on stakeholder engagement, hosting four Value chain sessions and 75 one-to-one matchmaking meetings in Stockholm, Helsinki, Oslo and Copenhagen, gathering over 250 participants from 130+ companies. The sessions enabled the forming of pilot groups, based on which the program's steering group selected the eight pilots for execution.

Picture: Value Chain Session 3 in Oslo, 2025

The execution (Fall 2025) involved eight pilot teams conducting circular solution trials in real building projects across Sweden, Finland and Norway, covering five major technical building solution product categories. The teams were supported by Joint piloting clinics, dedicated sparring sessions, site visits in Finland, Sweden and Norway, and the Circular pilot checklist.

Picture: Site Visit in Stockholm, 2025

The evaluation phase (Spring 2026) shifted focus to industry-wide learnings through two public review sessions, a final pilot survey and a final program event on April 22, 2026. The event synthesised the insights leading to this final report, along with industry and policy input.

1.3 Core partners and steering group

The Nordic Circularity Piloting Program was delivered by a Nordic partner consortium that covered the full technical building solution value chain, from manufacturers to end customers, including a contractor, a technical consultant, a reverse logistics provider, and a circularity network. The consortium was supported by a Nordic steering group of independent experts that guided the program from start to end.

Core partners

Combient Pure (FI) gathered the core partners and led the program. Combient Pure is a climate and circular solution development team within the Finnish-Swedish Combient Network of 37 large Nordic enterprises. It has worked with circularity in technical building solutions since 2022 and ran the predecessor Circularity Development Program with Vasakronan, ASSA ABLOY, KONE and

Swegon in 2023–2024. In NCPP, Combient Pure operated as program leader, orchestrating and facilitating the full program, including project management, industry-wide workshops, matchmaking, pilot support and communications.

Cradlenet (SE) is one of Sweden's leading business networks for circular transition. Together with its 140 member organisations, Cradlenet works to ensure that Sweden is circular by 2040. In NCPP, Cradlenet led the policy work of the program and contributed to communications, dissemination and workshop facilitation.

ASSA ABLOY (SE/FI) is the global leader in access solutions: locks, doors, gates and entrance automation. Its Finnish subsidiary, Abloy, has more than 100 years of experience in high-security locking solutions and is based in Joensuu.
Pilots*: Reused access system (Sweden, with Certego); Refurbishing access solutions (Finland, with the City of Tampere and Tampereen Tilapalvelut Oy).*

Demontera (SE) is a Swedish circular dismantling company specialised in selective dismantling, reuse inventories, warehousing and resale of building components, keeping material in circulation rather than turning it into waste.
Pilot*: Disassembling HVAC systems for reuse and refurbishment (Sweden, with Swegon, Lindab, Skanska Sweden and Vasakronan).*

KONE (FI, NO) is a global leader in the elevator and escalator industry, supporting the full lifecycle of buildings, from new equipment to maintenance and modernization, making people's journeys safe, convenient and reliable with smart and sustainable People Flow® solutions.
Pilot*: Elevator modernization (Norway, with CapMan Real Estate and Insenti).*

Multiconsult (NO) is a multidisciplinary engineering consultancy that provides technical advisory services to building clients, drawing on experience from circular research projects such as Green HVAC.
Pilot*: The reuse tool for electrical equipment (Norway, with Norwegian Property/NPRO and Trondheim Municipality).*

nolla_E (FI) is a Finnish technology company founded in 2014 that helps real estate achieve the best possible yield by finding profitable energy efficiency solutions.
Pilot*: Enhancing circular economy of HVAC systems (Finland and Sweden, with Kotkan Julkiset Kiinteistöt Oy and Skanska Sweden).*

Skanska Sweden (SE) is one of the Nordics' largest construction and project development companies, acting as main contractor in major new build and renovation projects.
Pilots: *Disassembling HVAC systems for reuse and refurbishment (Sweden, with Swegon, Lindab, Demontera and Vasakronan); Enhancing circular economy of HVAC systems (Sweden, with nolla_E).*

Swegon (SE/NO) is a Nordic HVAC equipment manufacturer specialised in indoor climate solutions.
Pilot*: Disassembling HVAC systems for reuse and refurbishment (Sweden, with Lindab, Skanska Sweden, Demontera and Vasakronan).*

Vasakronan (SE) is one of Sweden's largest property companies and a front-runner in circular property management, with a target of 100% circular use of materials by 2030.
Pilot*: Disassembling HVAC systems for reuse and refurbishment (Sweden, with Swegon, Lindab, Skanska Sweden and Demontera).*

The consortium of core partners ensured that the pilots were not designed in isolation but tested

across the full value chain. Next to the core partners, the program invited also other building sector companies to join the piloting, expanding to finally include 21 companies in the 8 pilot groups from across the Nordics.

Steering group

The program's steering group brought together Nordic experts in sustainable buildings and circularity, who supported the program from its earliest scoping discussions to the final dissemination of results. The steering group decided on the eight pilots that entered the execution phase, balancing product category coverage, geographical spread, and circular and sustainability ambitions. The group also provided feedback and probing questions in the pilot review sessions.

The steering group members were:

- **Antti Ruuska**, CEO, Green Building Council Finland (FI)
- **Ditte Lysgaard Vind**, Chief Innovation and Science Officer, Bloxhub (DK)
- **Elin Bergman**, Vice Chairman and Circular Impact Officer, Cradlenet (SE)
- **Erlend Seilskjær**, CTO, FutureBuilt (NO)
- **Marika Määttä,** Head of Combient Pure, Combient (FI)
- **Ulla Janson,** Senior Lecturer in Installation and Air Conditioning Engineering, Faculty of Engineering, Lund University (SE)

1.4 Impact

The Nordic Circularity Piloting Program delivered measurable impact on three levels: it built a Nordic ecosystem around circularity in technical building solutions, it enabled the execution of eight pilots between 21 companies, and it generated concrete insights from the pilots to support other companies in initiating circular solutions.

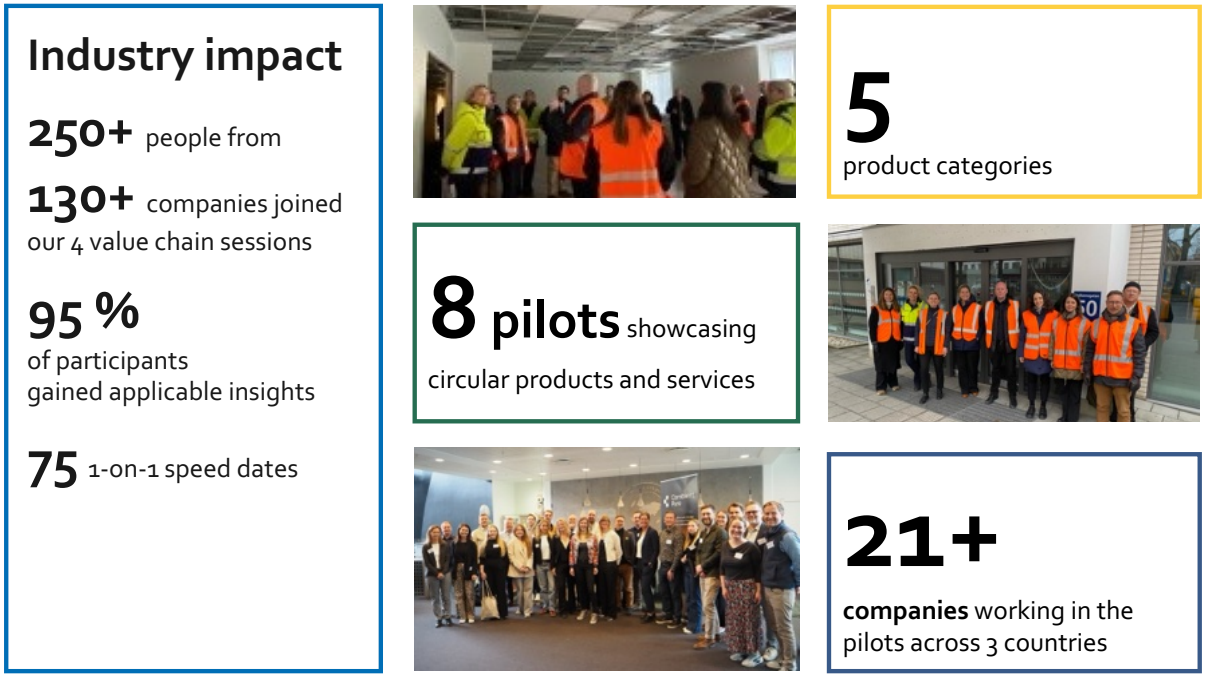

Figure 3: Key figures of the Program

1. The Nordic ecosystem for circular technical building solutions was strengthened

The program has gathered a broad Nordic community around circularity in technical building solutions. During spring 2025, four Value chain sessions in Nordic capital cities engaged **over 130 companies** and **more than 250 participants**, clarifying what circularity means in HVAC, elevators, access systems, sanitary equipment and electrical systems. These sessions also hosted **75 one-to-one matchmaking meetings** between value chain actors, providing participants with a wide view of available solutions and creating the conditions for the pilots to take shape. Seven additional "Friday fika" sessions were organised, giving companies further opportunities to engage with potential pilot partners.

The ecosystem was strengthened further by the 21 companies participating in the pilot teams, who shared their experiences and brought the results into the public conversation, generating significant media visibility [17]. Together, this built awareness across industry actors and confidence in the scaling potential of circular solutions.

2. The technical feasibility of circularity was proved through eight pilots
The program enabled the execution of **eight pilots**, engaging **21 companies** across **three countries** (Sweden, Finland, Norway) and covering **five major technical installation product categories**: HVAC, elevators, sanitary equipment, access systems and electrical systems. Each pilot involved two to five companies from the construction value chain, and 7 out of 8 teams tested solutions in real buildings during the autumn 2025 to early 2026 piloting period. Chapter 2 describes each pilot more thoroughly.

3. The learnings from the pilots will accelerate the scaling of circular solutions
The pilots demonstrated that circularity in technical building solutions is technically and operationally ready to scale. The final survey across the pilot teams confirmed this: over 92% considered their pilot successful, 85% confirmed technical and operational feasibility, 78% saw clear customer demand, and 85% are likely or very likely to scale the piloted solution in new projects. [5]

The pilots also clarified the needed new operating models and roles as well as the circular flow options for the technical building solutions value chain. The solutions can circulate in **three flow types**, each with different opportunities and bottlenecks:

- **Producer-led flow.** Manufacturers take products or parts of products back, refurbish and re-warrant them, and resell the products through their channels.
- **Flow within a property owner's portfolio.** Owners reuse products or parts of products across their own buildings, supported by consultants and service providers, and potentially manufacturers.
- **Flows between different property owners.** Dedicated platforms, reuse startups and/or service providers move the products or parts of products between owners.

The next Chapter (2) will dive deeper into each pilot, chapter 3 explores the business opportunities in the circular flow types further, and chapter 4 sets out the policy conditions needed to scale the solutions.

2

Piloted circular solutions

This chapter presents the eight pilots of the program across Sweden, Finland and Norway, covering five major technical building solution product categories. The pilots demonstrated how circularity can work in real buildings. The information in this chapter builds on the Nordic Circularity Piloting Program's pilot clinics, site visits, review sessions, pilot results survey and the final seminar on 22 April 2026.

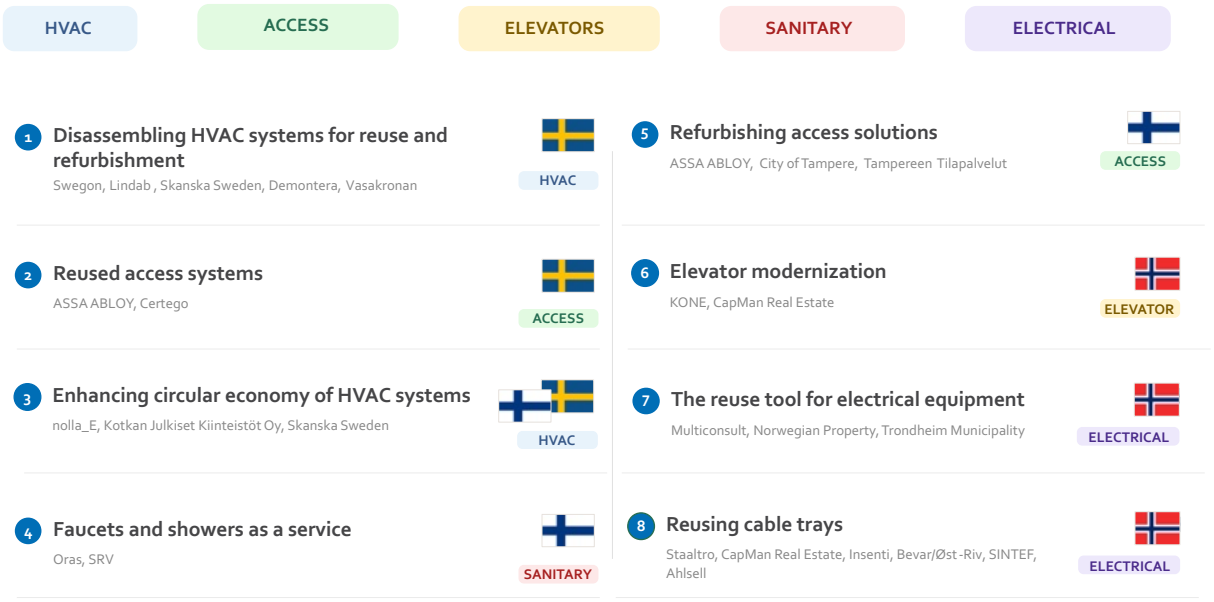

Figure 4: Circular pilots of the Program

Pilot 1

Disassembling HVAC systems for reuse and refurbishment

Partners: Swegon, Lindab, Skanska Sweden, Demontera, Vasakronan
Country: Sweden

What was piloted

Swegon and Lindab already operated take-back schemes for installed HVAC products, but the challenge was the inflow: too many products are scrapped at end-of-use rather than sent back to the manufacturer. With Skanska Sweden, Demontera and Vasakronan, the pilot tested the full take-back process for diffusers, air handling units (AHUs) and ducts: inventory, dismantling, packaging, logistics to the manufacturers, refurbishment, and follow-up on carbon savings.

Challenges and how they were tackled

- **Asbestos findings cancelled the first site.** At Tegelbruket in Stockholm, planning and inventory were completed, but dismantling was cancelled due to risk of asbestos. Galleria Boulevard in Kristianstad served as a second site, and learnings were gathered from both.
- **Timing and project conditions, not technology, were the bottleneck.** Early-stage planning and project readiness mattered more than technical capability.
- **Inventory quality suffered without HVAC installation expertise.** The fix: involve installation-competent people in the inventory from day one.
- **Generic dismantling instructions may lead to products being damaged during dismantling.** The fix: image-based, product-specific dismantling instructions.
- **Misaligned incentives across the value chain.** Clear benefits existed for buying reused HVAC products, but few incentives existed to send them back. The team modelled the take-back loop and the resale loop as two separate business models, so costs and revenues can be allocated where they fall.

Picture: Reuse of HVAC equipment, Stockholm 2025

Key learnings

- Reused HVAC products can deliver up to **95% lower climate impact** than new equivalents when refurbished and re-warranted by the manufacturer
- **Dismantling for reuse is not necessarily slower than demolition**: Air handling units added time is close to zero, diffusers a few minutes per product, and ducts a few minutes per section for both careful dismantling and packaging.
- Embed reuse requirements **before procurement**, prioritise high-impact products, and treat reuse inventories as part of the legally required materials inventory.
- **Sequencing matters**: ceilings and cable trays should be dismantled before HVAC.
- **Use contracts** that specify dismantling instructions, packaging, traceability and risk allocation.

Solution scaling probability: 4.5 / 5

Swegon is prepared to scale volumes and expand the offering to new markets and Lindab is planning to widen the offering to more product groups. The scaling depends also on external conditions of real estate owners setting clearer reuse targets and contractors more willing to use circular approaches.

"Our pilot showed that dismantling for reuse does not necessarily add much time. Yet it remains one of the biggest barriers, especially for smaller projects. To scale, we need aligned incentives across the value chain so that circular solutions become the natural choice."
— Caroline Jacobsson, Circularity Director, Swegon

"We see strong potential for scaling reuse within HVAC, especially when reuse is integrated early in project planning. The pilot confirmed that manufacturers can play a key role by ensuring quality, refurbishment and traceability, but scaling circular flows further will depend on improved access to reliable data on material availability in the existing building stock."
— Cecilia Cederek, Sustainability Specialist North Europe, Lindab

Picture: Dismantling HVAC equipment at Galleria Boulevard by Boulevardfastigheter, Kristianstad, 2026

Pilot 2

Reused access systems

Partners: ASSA ABLOY Openings Solutions Sweden (manufacturer), Certego (distributor and installation company)
Country: Sweden

What was piloted

ASSA ABLOY Opening Solutions Sweden operates several refurbishment processes. One example is its electromechanical access product families. Together with Certego, one of its distributors, a pilot was launched to improve the distribution flow and end-customer value proposition for refurbished products. The objective was to scale the volume of circular products sold. The team mapped the current flow from manufacturer to distributor to end customers, visited the refurbishment centre and designed an improved future-state flow. Based on the findings, they built a structured method to determine which products are suitable for refurbishment.

Challenges and how they were tackled

- **Low inflow of products into the selected product group.** The pilot was limited to a single product family with an existing refurbishment process. In future projects additional product categories will be included.
- **The distribution route to the end customer is based on linear sales principles.** Existing sales channels are designed to prioritize new products, rendering refurbished products remain in stock. The team has identified key stakeholders at both companies to support the operationalisation of a new flow.
- **Two business cases were identified.** One between the manufacturer and the distributor, and another between the distributor and the end customer. Each requires separate operational design and logic.

Key learnings

- **The technical refurbishment process is effective,** and there is a clear customer demand for circular products.
- **Refurbished products require a dedicated route to market.** Existing channels are designed for new products. A future model could include a standing quota of refurbished units within distributor orders.
- **The end-customer value proposition needs to be clearly defined.** Pricing, warranty, availability and the experience of "buying refurbished" must be explicitly articulated.
- **Scaling is more dependent on inflow than output.** Expanding sourcing to include additional product types or older products are realistic routes.

Solution scaling probability: 4.0 / 5
ASSA ABLOY and Certego will keep collaborating to expand refurbishment into more product categories. Scaling will require clear customer demand, a stronger business case, and an agreed, updated distribution flow across the value chain.

"We have learned a lot about both supplier and customer requirements. Distribution is the challenge. Our goal now is to keep cooperating with ASSA ABLOY and start selling and distributing refurbished products."
— Björn Persson, Head of Internal Control and Sustainability Certego

Pilot 3

Enhancing circular economy of HVAC systems

Partners: nolla_E (energy and circularity enabler), Kotkan Julkiset Kiinteistöt Oy (property owner), Skanska Sweden (contractor)
Countries: Finland and Sweden

What was piloted?

nolla_E and partners piloted reuse of existing air handling units in two real energy-renovation projects: Kotka Concert Hall in Finland and a central Uppsala block in Sweden. In Kotka, an air handling unit inside the Concert Hall was dismantled, modified for higher energy efficiency and relocated within the same building, as part of a wider energy-renovation that used nolla_E's software to find the optimal combination of measures for EU taxonomy-aligned performance. In Uppsala, the same approach was applied across a central city block. The second case prepared an AHU dismantled from a Skanska site in Stockholm for reuse in a different owner's building in Uppsala to demonstrate cross-portfolio reuse, but the transaction ultimately could not be closed as a workable dismantling price could not be agreed. nolla_E quantified energy efficiency, CO_2 impact and economics across the cases.

Challenges and how they were tackled

- **Product compatibility on site.** In Kotka, a selected unit had its service doors on the wrong side. The team found replacement equipment and added automatic compatibility checks to nolla_E's software so future plans flag mismatches in design.
- **Space, sequencing and on-site conditions.** Moving large modules required tight working spaces and enlarged structural openings, adding a few weeks. The team redesigned installation solutions during the project and accepted that early reuse projects need more flexibility in planning.
- **Pricing of dismantling work in the cross-portfolio case.** In Stockholm / Uppsala case the dismantling contractor could not set a workable price under the conditions, and that part of the pilot had to be terminated. nolla_E is now building the matchmaking and timing logic that cross-portfolio reuse requires, including a platform for reused HVAC equipment.

Key learnings

- **Reuse can be both climate- and cost-positive**. In Kotka, the wider energy project achieved a 64% CO_2 reduction with a 20% return on investment at energy project level, and 26% for the reuse case. The Uppsala block, in calculations, reached EU taxonomy-aligned performance with a similar 20% return without reuse and 28% with reuse.
- **Software-supported planning is decisive**: simulation plus compatibility checks turn reuse from opportunistic to repeatable.
- **Every actor needs to be incentivised with a clear "why"**. When each party sees a concrete benefit for themselves, from cost savings to new revenue or lower risk, circular solutions are easier to adopt.
- **Mindset and access to reusable equipment are still bottlenecks**; urban-mining audits would help close the gap.

Solution scaling probability: 4.5 / 5

nolla_E has similar projects in execution and is commercialising its reuse services, including HVAC material audits and a platform to match supply and demand. Kotkan Julkiset Kiinteistöt Oy plans to reuse machines and equipment whenever possible.


Picture: Site visit at the pilot site in Kotka 2025 & Kotka Concert Hall / Kotka, Finland

"In all our projects of this type, energy efficiency has improved and CO_2 emissions have reduced, and reuse has delivered a cost saving, not a cost premium. The key is that everyone in the project has a clear reason to do it."
— Nikolas Salomaa, Founder and CEO, nolla_E

Pilot 4

Faucets and showers as a service

Partners: Oras (manufacturer), SRV (construction company / lifecycle service provider)
Country: Finland

What was piloted?

Oras and SRV piloted a product-as-a-service model for faucets and showers in a public learning centre in Kirkkonummi. Oras delivers the products, installation and lifecycle maintenance, repair and refurbishment as a service to SRV's lifecycle project. When a unit breaks or reaches end-of-life on site, it is swapped as needed from a "circular stock", and the original is sent back to the factory for repair and reintroduction. With this solution, faucets are immediately usable after replacement, minimizing time spent on on-site troubleshooting and user disruption. It also saves materials, since the entire faucet does not need to be discarded or recycled due to a single faulty part. Connected sensor and IoT capabilities enable usage data, alerts and predictive maintenance, including water-flushing routines that prevent microbial growth during long school holidays.

Challenges and how they were tackled

- **Designing a business model that works commercially for every actor.** Immediate benefits go to the installer and end customer, while Oras carries the cost of organising take-back, refurbishment and logistics. The team treated the operational and business model as the core of the pilot, invested most of the time in planning, and worked out how Oras can be compensated for coordination.
- **Reverse logistics.** The team mapped and tested the reverse flow in real conditions.
- **Risk of cannibalising stakeholder sales revenue.** When faucets and showers are delivered as a service with focus on repairs, traditional income from replacement sales is reduced for the whole industry chain of manufacturer, wholesaler and installer. The team flagged this as a scaling consideration and is working on how to bring installers into the model as service partners rather than displaced parties.

Picture: Public learning centre in Kirkkonummi, Finland

Key learnings

- **Product-as-a-service works as a circular operating model** for faucets and showers, keeping products in productive use for longer.
- The model **simplifies responsibility on site**: a single operational point of contact at Oras replaces multi-party warranty handovers between developer, maintenance company, installer and manufacturer.
- **The value proposition lands particularly well with lifecycle-contract property owners** that must keep buildings operational year-round.
- **Plan the operational model carefully; execution is the easy part**.
- **Connected products are an enabler, not a feature**. Regulatory or financial drivers will accelerate adoption.

Solution scaling probability: 3.5 / 5

Oras will finalise the pilot within six months and decide on commercial expansion to additional sites. There are two priorities before scaling: designing the logistic chain at full operational scale and ensuring the business case is profitable for all stakeholders.

"Invest most of the time to plan and discuss the operational model and processes; execution is the easy part. The pilot is successful because we eventually found a way to make it tangible and cost efficient for both parties, and the next step is to make the business case solid."
— Juhani Lempinen, Group Product Manager, Oras

"The pilot implementation has been successful and shows promising results in improving service efficiency and transparency. However, further use is needed to validate outcomes and clarify actual costs."
— Marek Daszyński, Project Director, Lifecycle Projects, SRV

Pilot 5

Refurbishing access solutions

Partners: ABLOY (manufacturer), City of Tampere, Tampereen Tilapalvelut Oy (property owner / facility services)
Country: Finland

What was piloted?

The City of Tampere is replacing an old school in the Tammela district, with a new one planned for 2028, under zoning regulation promoting material reuse. The pilot tested whether dismantled Abloy locking solutions from the old school could be refurbished at the factory and reinstalled in the new building. The team carried out a full on-site inventory, disassembled selected units, tested several factory refurbishment methods (surface treatment as the main candidate), and produced a first cost comparison between a refurbished unit and a new product.

Challenges and how they were tackled

- **Locking solution for the new school not yet decided.** The team responded by treating the pilot as a structured learning case and lining up a second, larger project as the next test ground.
- **Product compatibility across generations.** Some older product generations were not compatible with current spare parts or standards, so planned part replacements could not be done. Most of the products remained functional, and surface re-treatment was applied instead. While replacing wear components was not possible for all products included in this pilot, it is feasible for most product types.
- **CE marking and compliance.** There is no clear guidance today on how factory refurbishment affects CE marking. The team flagged this as a precondition for scaling and is engaging with the wider industry initiative on the topic.


Picture: Tammela School, Tampere

Key learnings

- **Factory refurbishment is technically feasible and integrates into existing production**: surface treatment delivers high coating quality and good durability with no additional investment.
- **Cross-stakeholder collaboration was the success factor**, keeping the pilot moving when the decision on the future reuse became uncertain.
- **Start with a good inventory** and verify regulatory and technical requirements before any refurbishment.
- **The cost case is promising but not yet conclusive**, and the main blocker is market demand, not technology.
- **Zoning regulations for material reuse are a driver.** In Tammela, local zoning rules requiring material reuse were a prerequisite for the pilot, making it natural to explore refurbishment instead of defaulting to new products.

Solution scaling probability: 5 / 5

Abloy plans to scale the refurbishment process through a larger building project and a wider industry initiative on business models, refurbishment and CE marking for access solutions.

Picture: Abloy factory, Joensuu

"Surface treatment proved technically feasible and easy to integrate into our existing processes, with high coating quality and good durability. The pilot was successful as a learning project, but compliance, product compatibility and market demand still need to be solved before refurbishment can become a scalable business.
— Heli Tolvanen, Product Sustainability Manager, Abloy Oy

Pilot 6

Elevator modernization

Partners: KONE (manufacturer), CapMan Real Estate (property owner), Insenti (project / construction lead)
Country: Norway

What was piloted?

CapMan Real Estate is fully renovating an 18-floor office building of approximately 21,000 m² in central Oslo, targeting BREEAM Excellent (v6.1) and Energy Class A. The building's five elevators date from 2003. The original plan was a full replacement. KONE proposed partial modernization, retaining shafts and major load-bearing steel structures and replacing only outdated or inefficient components. The pilot focused on the design stage, as the implementation of the pilot will happen earliest in fall 2026. The pilot tested whether partial modernization could deliver the same performance and certification requirements as full replacement at a significantly lower embodied-carbon and material footprint. Old drives were planned to be dismantled for potential refurbishment study and second-life use in other KONE projects.

Challenges and how they were tackled

- **Developing shared confidence in partial modernization across stakeholder groups.** The approach was still new at this scale. The team developed a thorough value proposition and complemented it with an independent second-opinion review that confirmed the original results.
- **Highly site-specific CO_2 data.** Calculations required significant manual work. The team's response is to standardise and automate the calculation process for future projects.
- **Timing of the modernization-versus-replacement analysis.** The decision must happen very early, before renovation specifications are locked in.

Picture: Site visit at the pilot site, Oslo 2026

Key learnings

- **Partial modernization saves around 60% of embodied emissions** versus full replacement, roughly **112 tonnes CO_2** on this project.
- **More than 60% of heavy steel components were retained**.
- **End-user experience is preserved**: fully renovated car interior, new doors and signalisation, and an increase in elevator speed by 20-25% for around 1,100 occupants at peak.
- **Energy efficiency upgrade is included**, with more efficient drives and a destination control system reducing operational emissions on top of the embodied savings.
- **Stakeholder alignment is essential**, and an independently validated value proposition is an effective way to build it.

Solution scaling probability: 5 / 5

The pilot is on track for installation during fall 2026 to 2027, and KONE plans to scale partial modernization as a standard offering for buildings of comparable age and configuration.

Picture: Site visit at the pilot site, Oslo 2026

"We took an analytical approach to what we can actually retain in the elevator and still keep performance and user experience at the same level. With partial modernization we save 60 to 70% of embodied carbon and the elevator still looks and feels like new."
— Mari Lemberg, Senior Manager, Circularity and Sustainability, Global Modernization, KONE

Pilot 7

The reuse tool for electrical equipment

Partners: Multiconsult (engineering consultant, tool developer), Norwegian Property/NPRO (property owner), Trondheim Municipality
Country: Norway

What was piloted?

Multiconsult developed and validated a reuse tool for electrical equipment, a structured methodology to systematically assess and visualise the reuse potential of electrical components in a building. The tool supports early-phase decisions, detailed reuse inventories during design, and final reuse documentation. It helps designers, property owners and decision makers identify components with high reuse value, for example lighting fixtures, distribution boards and cable management. It was tested in two real cases, one private and one public: NPRO's commercial building at Snarøyveien 30 and Trondheim Municipality's Tonstad School. The work was carried out with Multiconsult's electrical engineers and the property owners' teams.

Challenges and how they were tackled

- **Data quality and consistency.** Two lighting fixtures with the same description could have very different embodied emissions. The team anchored the tool in reliable public data for cost and emissions, and defined clear input fields and assessment criteria.
- **Data availability about the existing building.** The tool was designed to work with partial data in the early phase, and to be enriched progressively as the project moves forward.
- **Avoiding misuse.** The tool is designed for use by experienced electrical engineers with project-specific judgement, supporting decisions rather than replacing them.

Picture: Electrical equipment at pilot site, Norway 2026

Key learnings

- **Electrical equipment is a serious circular opportunity**: reuse of selected components can deliver embodied-carbon savings, material reuse and cost savings, particularly when reuse is decided early enough to influence design. In one of the pilot sites, the reuse tool identified potential savings of 123 tonnes of CO_2 and approximately 23 million NOK from reusing electrical components, with the highest potential in low-voltage equipment such as cable trays, distribution boards and lighting fixtures.
- **Early-phase use is where the tool supports the most.**
- **Standardised assessment is what makes scaling possible**.
- **Cross-sector validation matters**: testing with a private property owner and a public client confirmed applicability across building types.
- **Reuse needs a structural pull**: clearer regulatory drivers, financial incentives and standardised documentation.

Solution scaling probability: 4.5 / 5

Over the next 12 to 24 months, Multiconsult will refine and broaden the reuse tool, expand it to additional component categories (including HVAC), and integrate it into the firm's design processes.

"From the reuse tool you can get concrete numbers from a simple site visit and see where the potential lies. Used in early design, reuse becomes much easier and lowers the installation cost. The tool addresses a real need in the industry."
— Håvard Meinseth, Sustainable Electrical Advisor and Tool Developer, Multiconsult

Pilot 8

Reusing cable trays

Partners: Staaltro (reuse operator and seller), CapMan Real Estate (property owner of donor building), Insenti (project lead), Bevar/Øst-Riv (demolition and dismantling contractor), SINTEF (LCA), Ahlsell (wholesaler partner)
Country: Norway

What was piloted

Staaltro, a Norwegian reuse startup focused on circular steel products, piloted a full dismantling-to-distribution flow for steel cable trays in a real Oslo rehabilitation project. The pilot tested five concrete objectives: an effective deconstruction method; documentation of time and effort for careful dismantling vs. demolition; assessment of how many trays are fit for reuse; a quality assessment document registrable in EFObasen (Norwegian electrical-industry product database); and the remaining lifecycle of a reused tray. 145 metres of cable trays were dismantled.

Challenges and how they were tackled

- **Timing and project access.** Staaltro joined mid-execution rather than during planning, which limited the scope. Staaltro is now developing standard tender clauses that property owners can insert into demolition contracts to make early reuse engagement the default.
- **Material condition assessed too late.** Visible corrosion in the humid garage environment, combined with assessment happening after dismantling, meant the trays could not be safely resold. The team chose to continue the pilot as a process and documentation case. By Q3 2026, Staaltro will have a standardised on-site condition assessment protocol anchored in the SINTEF LCA data, giving a go or no-go decision before dismantling.
- **Dismantling economics.** A one-person method with a dedicated work frame proved more efficient than a two-person setup, and the resulting time-and-cost data was used to define a market-acceptable price point with partners.

Key learnings

- **The CO_2 case is exceptionally strong**: SINTEF's LCA shows reusing cable trays delivers a **93% reduction in lifecycle emissions** vs. new (from 19.2 to 1.3 kg CO_2e per unit, assuming at least 50 years of remaining lifespan), and **99% in the production phase alone**. For the 145 metres in this pilot, that would have been about **868 kg CO_2e** saved over a building lifetime, had material conditions allowed reuse.
- **Cable trays are an ideal first product category** for reuse: design has barely changed in 40 years, old units can be combined with new, and the European standard makes them transferable across markets.
- **Quality assessment must happen before dismantling, not after**, the single most important process change identified by the pilot.
- **Early property-owner commitment is decisive**: when reuse is in the project brief, the rest of the value chain follows.

Solution scaling probability: 5 / 5

Staaltro is planning to conduct a first full-cycle case for cable trays during 2026. From 2027 the same approach will extend to sprinkler pipes and ventilation components.

"A meeting with CapMan and a presentation at NCPP led to this pilot. CapMan gave us a real building to prove reuse on, and that was the pivotal point. It got the ball rolling, opened doors to other customers, and showed what it means to have someone take a chance on you. Cable trays are just the start. We're continuing the reuse journey, with the goal of completing full-cycle cases this year."
— Fredrikke Rusten, CEO,Staaltro

Picture: Dismantling of cable trays, Oslo 2025

3

The future of circularity in technical building solutions

The eight pilots made visible that the **technical side of circularity in technical building solutions works**: products can be dismantled, refurbished, reused and re-warranted. Also customer demand exists. The climate benefits are clear. In the future, the industry may not move in one single direction, but rather develop solutions according to **three circular flow types** for technical building solutions, alongside the still-dominant linear flow of products that ends in recycling or waste.

Each new flow type opens different business opportunities for different parts of the value chain, and the flow type often matters more than the product category for an industry operator: it shapes **who leads and pays for the work, who carries the risk, and where the new business value lies**. This chapter first presents what the pilots collectively explored about scaling, then introduces the three flows and the business opportunities they create, and finally defines the structural challenges which still need to be addressed by the value chain as a whole.

Figure 5: The three new flows for circulating technical building solutions and how the pilots represent them.

3.1 Pilots prove scaling potential for circular solutions

A final survey of all eight pilot teams in April 2026 (n=14, all eight pilots represented) gave a clear, quantified picture of where the pilots landed and how ready and willing the participating companies are to scale the piloted solutions.

The headline result is that **the pilots delivered, and the companies are ready to move**:

- **92%** of respondents rated their pilot successful or very successful.
- **85%** confirmed that the piloted solution was technically feasible in real-life conditions.
- **78%** said the pilot demonstrated clear customer demand.
- **85%** are likely or very likely to start scaling the piloted solution in new projects.

Together, these four numbers close the question of whether circularity in technical building solutions is technically viable. **The pilots moved the conversation past feasibility and into commercial readiness**.

Beyond technical feasibility, the pilots also delivered measurable climate impact. Five of the eight pilots reported quantified CO_2 savings, and the magnitudes are notable: between 60% and 99% reductions compared to linear, new-product alternatives, depending on the product category and circular strategy applied. The three pilots that did not quantify CO_2 (Pilots 2, 4 and 5) focused by design on business models, service offerings and process feasibility rather than per-project carbon accounting. The numbers are not directly comparable across pilots, but together they confirm that circular technical building solutions deliver climate benefits in the same order of magnitude as the largest decarbonisation levers available to the building sector today.

PILOT	CO_2 savings
1. Disassembling HVAC for reuse and refurbishment	Up to 95% lower vs. new
3. Enhancing circular economy of HVAC	64% reduction in Kotka project
6. Elevator modernization	~60% / 112 tonnes vs. full replacement
7. Reuse tool for electrical equipment	~123 tonnes in one case
8. Reusing cable trays	93% lifecycle / 99% production phase

Figure 6:CO_2 savings reported by the pilots

The final survey also identified three success factors that stood out across all eight pilots:

- Early integration of circularity into project planning and procurement.
- Existing people, skills and organisational culture supporting the new way of working.
- Strong collaboration and commitment between pilot partners.

The picture is consistent: the technical foundations are in place, and the climate impact is significant. What still needs to fall into place sits outside the individual pilot team, in the wider value chain. Establishing a circular market at scale requires market-led initiatives as well as strong policy frameworks. This report will address these in the upcoming sections and in Chapter 4.

3.2 Three flows, three sets of next moves

Each of the three flow types opens a different set of business opportunities for different parts of the value chain, and each comes with a different set of next moves for an industry operator.

Producer-led flow

How it works. The manufacturer collects installed products back, refurbishes them in their own facilities or with trusted partners, and reintroduces them to the market with full warranty and guarantees. The producer retains technical control and brand responsibility across multiple life cycles. The original product may return to the first customer, but more often is resold to a different one.

Product volume potential. Highest of the three flows. Producers, at least in theory, know where their installed base is and how to retrieve it. The bottleneck today is not technical execution of reuse, but **inflow**: getting enough installed products back through incentivised, well-organised value chain action.

Business opportunities by role:

- **Manufacturers** lead the loop from end to end. They manage take-back, refurbishment, re-warranting, and resale, gaining multi-life revenue stream from their installed base. The business case and logistics need to be designed separately for the inflow of used products and the outflow of refurbished ones.
  Next move. Scope a focused product family with good prerequisites (volume, complexity, spare-part availability, climate impact). Build the inflow channel with property owners and contractors, and the outflow channel with distributors and end customers. Price the dismantling effort into the resale rather than carry it on the demolition project alone.
- **Installers** become service partners by supporting both dismantling and reinstallation of refurbished products. This was a missing role in several pilots, but it is essential at scale.
  Next move. Offer dismantling-for-reuse as an explicit service line, with image-based instructions and traceability.
- **Service providers** can build new offerings around take-back logistics, dismantling, quality assurance, warranties and impact calculation.
  Next move. Develop a standard service catalogue for take-back projects and price it transparently across the value chain.
- **Distributors** can develop dedicated routes to market for refurbished products: standing quotas of refurbished units in distributor orders, separate webshop or shop channels, and integrated warranty handling.
  Next move. Agree a refurbished-product quota and route with one manufacturer partner, on a defined product family.
- **Property owners and construction companies** are the route to the installed base. Without their engagement, no products flow back.
  Next move. Sign up to a take-back scheme with one or two manufacturer partners and embed it in the next renovation or replacement project.

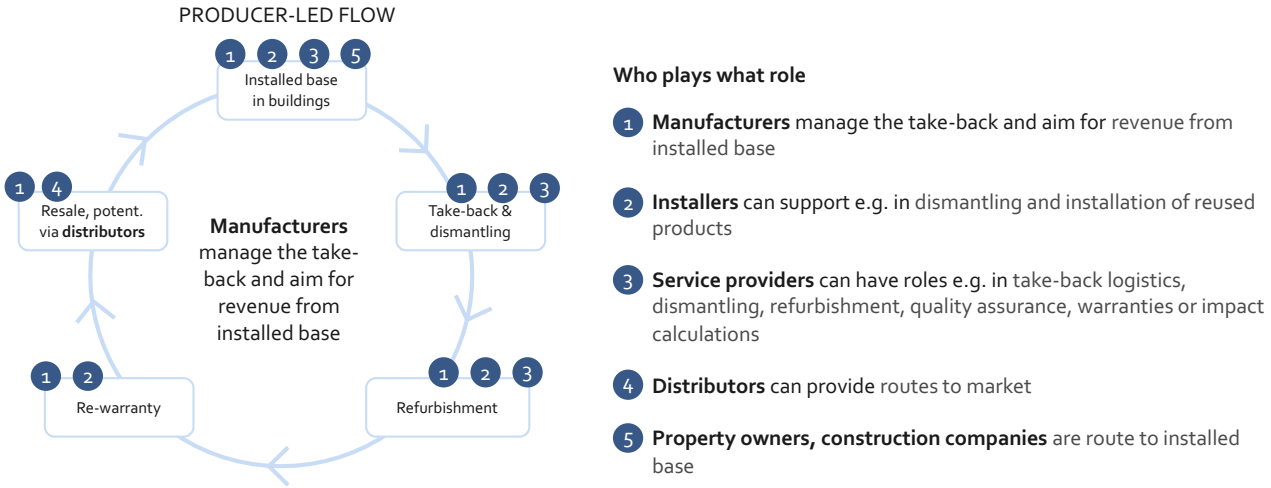

Figure 7: Producer-led flow

Flows within a single property owner's portfolio

How it works. A property owner reuses technical building solutions within their own portfolio of buildings: components are dismantled from one site and reinstalled in another building owned by the same organisation. Decision-making is internal, which simplifies governance and makes circular value visible directly in the portfolio's climate and cost KPIs. In practice, property owners rely on external service providers (consultants, sustainability advisors, product specialists) to identify the reuse potential and quantify the impact.

Product volume potential. Limited to the owner's portfolio, but for large public and private real estate owners that volume is significant. The key future question is which tools and processes make reuse a repeatable portfolio-level practice, including portfolio-wide material audits ("urban mining"), software-supported compatibility checks, and design teams that treat reuse as a default option.

Business opportunities by role:

- **Property owners** lead the loop. Their portfolio becomes a circular asset base: lifecycle costs come down, embodied emissions go down, and reuse becomes visible directly in portfolio-level KPIs.
  Next move. Insert reuse-first into the early planning phase of the next renovation project, supported by a portfolio-wide material audit.
- **Service providers**, including software and data providers, identify the reuse potential, perform product audits, quantify impact, offer storage services, and design the technical solutions.
  Next move. Develop a productised reuse-potential assessment and build the matchmaking and compatibility logic that lets reuse decisions sit on top of existing building information.
- **Manufacturers** can provide refurbishment services, certify reused units from their own brand and define the quality standards that make reuse trustworthy.
  Next move. Define a brand-certification path for reused units.
- **Installers** support pre-demolition inventory audits, dismantling, reinstallation of reused products within the portfolio.
  Next move. Offer pre-demolition inventory audits, dismantling and reinstallation (as a packaged) services for portfolio-level reuse projects.

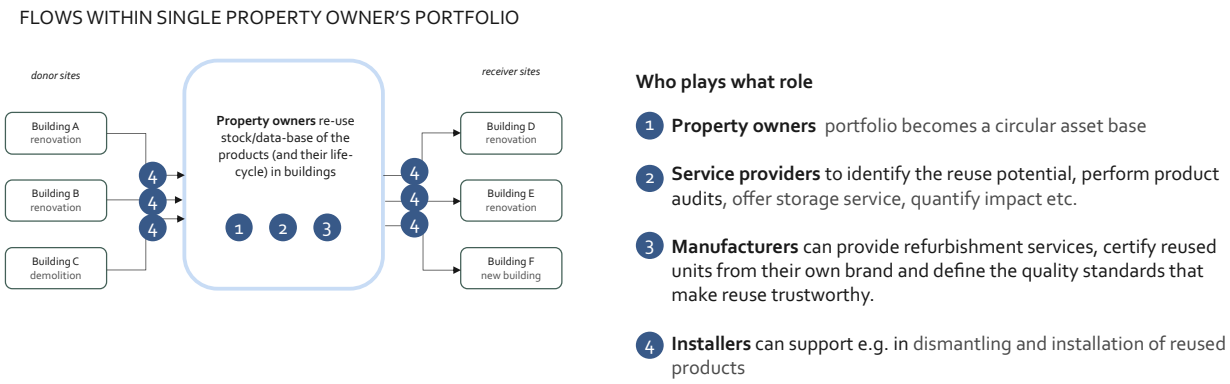

Figure 8: Flows within single property owner's portfolio

Flows between different property owners

How it works. Technical building solutions move from one owner's building to another's, typically through dismantlers, reuse startups, wholesalers and digital platforms. This is the flow with the largest theoretical product volume of the three: the whole Nordic building stock becomes the donor base. It is also the flow that requires the most new coordination: trust, transparency, quality assurance, and matching supply with demand at scale.

Product volume potential. High in theory, but realised volume depends on a functioning marketplace. The key future question is how to match supply and demand at scale, where product location and condition data is one essential element to enable the set up of a platform/marketplace. Also refurbishment activities, re-warranties, and contractual defaults that allow reuse are in key to get products back.

Business opportunities by role:

- **Service providers (including reuse startups, consultants and dismantlers)** build the missing infrastructure between donor and receiving buildings: dismantling, condition assessment, documentation, quality assurance, classification, matchmaking and distribution.
  Next move. Secure early access to donor buildings through standard tender clauses, and anchor the offering in a recognised quality classification.
  Next move. Open a defined product category to reused units alongside new ones, with a clear classification and price point.
- **Manufacturers** can certify reused units from their own brand, supply refurbishment services to service providers and wholesalers, and define the quality standards that make reuse trustworthy.
  Next move. Define a brand-certification path for reused units.
- **Property owners (donors and receivers)** are the supply and demand side of the marketplace. The flow only works if owners are willing to make their installed base available for resale and to procure reused products into their next projects.
  Next move. Sign up as a donor or a receiver in one upcoming project, with a standard contract that defines responsibilities, timing and pricing.
- **Wholesalers and distributors** integrate reused products into mainstream channels, with recognised classifications and pricing that competes with new.

- **Public clients and procurement leads** are decisive: their procurement volume is large enough to create the demand that makes the rest of the model economically viable. **Next move.** Include reuse requirements or reuse quotas in the next procurement tender.

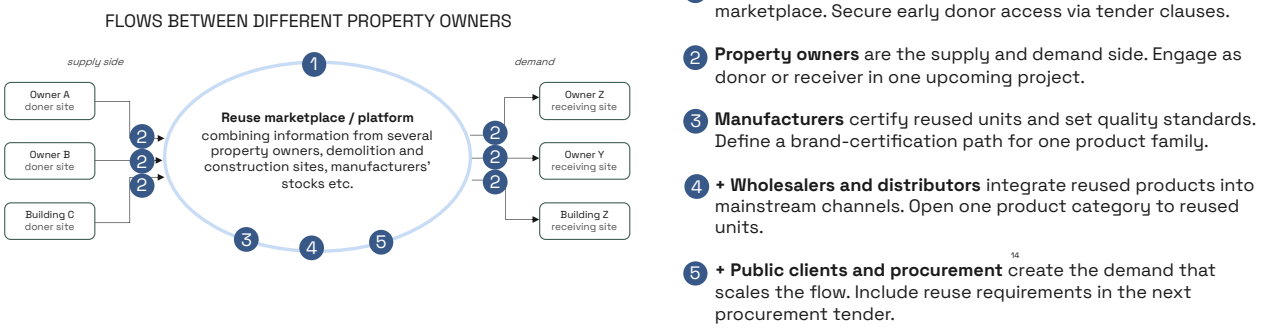

Figure 9: Flows between different property owners

The three flows are **not mutually exclusive**. The producer-led flow and the between-owners flow can complement each other (manufacturers certifying units that reuse providers resell) or compete (manufacturer take-back and independent reuse providers chasing the same inflow). For the Nordic industry, this is healthy: it creates multiple routes to scale and multiple entry points for new business.

It is not a coincidence that the majority of NCPP pilots fall in the producer-led flow. Combient Pure's previous Circularity development program identified manufacturers as central to making circular solutions move at all, and manufacturers were strongly represented among the core partners. They already have many of the elemental ingredients in place: deep product knowledge, repair and refurbishment capability, and brand and warranty control.

3.3 What is still needed to scale circular technical building solutions

The pilots proved that circularity in technical building solutions works in practice. To turn pilots into repeated processes and projects, structural challenges still need to be addressed by the value chain as a whole. The final survey to the piloting companies pointed to a few unresolved problems for scaling:

- **Stakeholder readiness** is uneven and some stakeholders are open to new ideas but not yet committed at scale. The commitment still depends on individual people and relationships rather than being standard practice.
- **The business case** is not yet solid. Reuse adds new types of work and costs compared to a linear approach, and the value chain has not yet found a way for every actor to reach a comparable margin. Buying new is still the easy and cost-effective way to go for the industry.
- **Contracts and ownership models** are not designed for circular flows, so every project negotiates dismantling effort, warranty and second-life questions from the start. Commercial incentives do not reward the actors who carry the extra effort for circularity.
- Reused products without **recognised classification** remain invisible to procurement systems, wholesalers and insurance regimes.

- **The infrastructure** for take-back, quality assurance and matchmaking between supply and demand is still missing or fragmented across the Nordic region.

These challenges slow down the shift from pilots into repeatable practice. The industry itself can take action on some of them, particularly around contracting, dismantling practices and value chain incentives within commercial relationships. Others, like the recognised classification of reused products and missing infrastructure and cross-border consistency, depend on a Nordic policy environment that makes circular practice the default rather than the exception. Chapter 4 sets out policy input that the program directs to the Nordic Council of Ministers, addressing these conditions.

4

Policy input

Nordic companies operate in a policy landscape still mainly designed for a linear market. That landscape is changing fast. Since the EU Circular Economy Action Plan in 2020, circular economy policy has moved at a constant pace, with the aim of making Europe the most circular region in the world by 2030. The upcoming Circular Economy Act is expected to shift the market for secondary resources significantly. [6]

EU policy applies directly to Denmark, Finland and Sweden, and reaches Iceland and Norway through the European Economic Area. The individual states play an important role in implementing and monitoring EU policy. Timely and harmonised implementation in the Nordic region is key for Nordic companies to stay competitive on a circular market.

The Nordic Council of Ministers is the intergovernmental body delivering the Prime Ministers' vision that the Nordic region will become the most sustainable and integrated region in the world by 2030. One of its goals is for the Nordic Region to be a leading player in the transition to climate neutrality and climate resilience. Another goal is to promote a circular economy in the Nordic countries. [7]

Yet, as has become evident during NCPP, there are barriers slowing the implementation of circular practices in the Nordics, such as misaligned incentives across the value chain, unclear regulatory status for refurbished products, missing infrastructure for take-back and quality assurance, and a market where new is still cheaper than reused. These barriers cannot be fully solved by individual companies or value chains. They require policy action.

The following policy input is directed at the Nordic Council of Ministers. It can be acted on by issuing recommendations to member states, setting up joint working groups for Nordic harmonisation, joint funding of projects and pilots, and by developing joint Nordic positions for EU legislative processes.

These measures would remove obstacles for scaling and strengthen the competitiveness of Nordic companies providing circular solutions for technical installations. They have been framed based on real-life insights from Nordic companies in the program, building on the learnings and needs accumulating from the circular pilot projects.

Picture: The Future of Circularity of Technical Building Solutions, April 22, 2026

A. Enable a Nordic circular market for technical building solutions

Some aspects of technical building solutions make them particularly suitable for circulation, and make a Nordic circular market for them particularly compelling. A dedicated joint Nordic initiative for circulating technical building solutions would address both.

From a product perspective, technical solutions typically have a standardised design, making them compatible across different buildings. Components such as control units, batteries and motors have high value per unit of volume and are comparably easy to transport, making it economically viable to move them between sites for refurbishment, remanufacturing or redeployment.

From a company perspective, individual national markets may not provide enough volume to scale a circular business in this category. Harmonising legislation and infrastructure across the Nordic region would give companies a large enough market to invest in scaling circular solutions, and strengthen their competitiveness beyond Nordic borders.

From a government perspective, a Nordic circular market for technical building solutions increases resilience and secures access to valuable resources on a volatile global market. Technical building solutions contain strategic raw materials, including rare earth elements in heat pump compressors and motors, copper in electrical infrastructure, and lithium in building-integrated battery systems, that are currently lost to general demolition waste streams at near-zero recovery rates. [11] An integrated Nordic circular market for technical installations could support the Nordic EU member states in laying the groundwork for Digital Product Passports and meeting binding obligations across a broad range of EU legislation, including the Critical Raw Materials Act, the Waste Framework Directive, the Battery Regulation, the European Climate Law, the Effort Sharing Regulation, and the forthcoming Circular Economy Act. [12]

Input: The Nordic Council of Ministers could launch a dedicated joint Nordic initiative for further investigating barriers, opportunities and implementing needed solutions for establishing a Nordic circular market for technical building solutions.

B. Make circular requirements mandatory in public procurement

Procurement behaviour changes slowly. A Cradlenet survey shows that only 14% of Swedish municipalities often include circular requirements in procurement. [8] At scale, change happens when something becomes mandatory.

Without a demand-side requirement, reused products and materials compete on price against new ones in a market where the true cost of virgin materials is not reflected. Mandatory circular requirements in public procurement create demand at the volume needed for companies to develop circular products, services and solutions. They also have a mainstreaming effect across the value chain: when circularity is required from the procurement stage, redesigning business models and offerings becomes the natural response, not only for public sector contracts but across the market. Being one of the most resource intensive sectors, construction – including technical installations – could be a prioritised procurement category.

Input: The Nordic Council of Ministers could issue a recommendation to member governments to introduce mandatory circular criteria in public procurement for construction, including technical installations.

C. Set binding circularity targets for technical solutions in building codes

This would make circular solutions the default rather than the exception in technical installation projects, and establish a predictable framework for circular business models to scale within. A complementary measure could be to also include mandatory systematic material audits of existing building portfolios to proactively map reuse potential before renovation or demolition is planned. Such measures are within the jurisdiction of each state and could be developed and aligned throughout the Nordics. The *FutureBuilt Circular - criteria for circular buildings* could be a guiding framework for establishing criteria, methods and timelines for these targets. [13]

Input: The Nordic Council of Ministers could coordinate the development of harmonised Nordic criteria, methods and timelines for circularity targets in building codes.

D. Use economic incentives to make circular technical building solutions competitive

Current infrastructure, markets and price signals are still optimised for a linear take-make-waste economy. The circular infrastructure is fragmented and often supports only the costliest and least efficient strategies, such as material and energy recycling, while the greatest value is captured earlier in the loop through repair, refurbishment, remanufacturing and reuse. At the same time, natural resource prices rarely reflect environmental externalities, while labour is heavily taxed in the Nordics. Because circular practices are more labour-intensive than linear ones, this combination of cheap virgin resources and expensive labour creates structurally higher costs for circular business models, including those for technical building equipment.

Targeted economic incentives, such as subsidies, favourable loan criteria or a tax shift from labour to resource use could help correct this imbalance. This could improve the competitiveness of circular solutions, support Nordic companies and help meet EU obligations under the Waste Framework Directive, the Critical Raw Materials Act and Ecodesign for Sustainable Products Regulation [12],

while aligning with emerging initiatives like the *Nordic Roadmap for Circular Financing 2026-2030* [10].

Input: The Nordic Council of Ministers could commission a joint Nordic study of the most effective financial and fiscal instruments for supporting circular economy in technical building equipment, and develop coordinated recommendations to member governments for their implementation.

E. Set climate-aligned lifecycle GWP thresholds for technical building installations

Well-intended rules for increasing energy performance in buildings has led to the suboptimised consequence that older installations often are replaced with new ones even if they are much less energy efficient considering the whole lifecycle. A recast Energy Performance of Buildings Directive (EPBD) has been introduced by the EU that member states need to transpose to national law by May 2026. This recast introduces lifecycle global warming potential (GWP) thresholds for new buildings, including technical installations. [14] Nordic countries could ensure that national thresholds under the new EPBD are promptly implemented and that they are in line with EU climate targets and the 1,5°C target of the Paris Agreement. This would set a new standard promoting circular technical installations as well as delivering on the Nordic Prime Ministers' vision 2030.

Input: The Nordic Council of Ministers could issue a recommendation to all Nordic governments to ensure that national building regulations set lifecycle GWP thresholds for technical installations that are in line with EU climate targets and the 1.5°C target of the Paris Agreement.

F. Remove CE marking barriers for refurbished and remanufactured products

Current CE marking requirements make refurbishment economically unviable for many technical installation categories due to comprehensive assessment procedures. Legal barriers also exist, since it is sometimes unclear if the original manufacturer or the remanufacturer has legal responsibility for CE compliance under EU regulation. Simplified compliance would remove a structural regulatory barrier for the reuse market. CE marking requirements are set on the EU level, whereas monitoring bodies, so called Notified Bodies, in each member state ensure compliance. [15]

Input: The Nordic Council of Ministers could develop a joint position towards the EU for simplifying and clarifying conformity assessment procedures, and issue interim national guidance to reduce the legal uncertainty that currently discourages investment in refurbishment.

G. Develop Chromium VI field testing standards to unlock reuse of ventilation ducts

Chromium VI is a highly carcinogenic substance that may occur in older ventilation ducts and other installations, due to the historical use of surface treatments of galvanized and stainless steel. The risk for exposure occurs when the substance is released during cleaning and cutting processes. As a precaution, ducts manufactured before 2006 are currently destroyed rather than reused when taken out of use. [16] Without accessible testing, the precautionary default to destruction prevails even where the substance may not be present. Standardised rapid field-testing protocols, integrated into pre-demolition audit requirements, would enable reliable on-site confirmation of Cr6+ status and release significant volumes into circular reuse streams.

Input: The Nordic Council of Ministers could initiate and fund a joint Nordic project for developing and evaluating rapid field-testing methods and standards for Cr6+, to safely unlock circular reuse of ventilation ducts and other affected technical installations.

These policy inputs have been co-developed with representatives from the companies that piloted circular solutions in the program. They reflect the hands-on insights and practical expertise of individuals directly involved in the pilots, and do not necessarily represent the official position of their organisations.

Summary: Scaling Circular Technical Building Solutions in the Nordics

Nordic companies are ready to scale circular solutions for technical building equipment, but they are held back by a policy landscape still designed for a linear market. Barriers include misaligned incentives across the value chain, unclear regulatory status for refurbished products and missing take-back infrastructure. These obstacles require coordinated policy action.

Based on real-life insights from companies in the Nordic Circular Pilot Program (NCPP), we ask the **Nordic Council of Ministers** to act on the following recommendations. Together, they would strengthen the competitiveness of Nordic companies and help member states meet binding EU obligations (including the Critical Raw Materials Act, Waste Framework Directive, EPBD, and the upcoming Circular Economy Act):

A. Launch a dedicated joint Nordic initiative to further investigate the barriers and opportunities and to implement the needed solutions to establish a Nordic circular market for technical building solutions.

B. Recommend that member governments introduce mandatory circular criteria in public procurement for construction, including technical installations.

C. Coordinate the development of harmonised Nordic criteria, methods and timelines for circularity targets in building codes.

D. Commission a joint Nordic study on the most effective financial and fiscal instruments for supporting circular technical building solutions and develop coordinated recommendations to member governments.

E. Recommend that national building regulations set lifecycle GWP thresholds for technical installations aligned with EU climate targets and the 1.5°C Paris target, as part of EPBD implementation.

F. Develop a joint Nordic position towards the EU to simplify and clarify the conformity assessment procedures of CE marking for refurbished/remanufactured products, and issue interim national guidance.

G. Initiate and fund a joint Nordic project to develop rapid field-testing standards for Chromium VI, unlocking reuse of ventilation ducts and other affected installations.

We invite the Nordic Council of Ministers to forward these inputs to the relevant Nordic working groups for operationalisation: through recommendations to member states, joint working groups for Nordic harmonisation, joint funding of pilots, and joint Nordic positions in EU legislative processes.

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