



Circular machine building in practice

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Lessons from three companies on circular machinery design

Circular machine building is gaining momentum. More and more companies are looking for machinery that both performs strongly and reduces environmental impact. In Living Lab project Circular Machine Building, three companies looked for suitable circular strategies for their product, company and market. This article presents the key technology insights, so you can consider what you can apply to your own machinery.

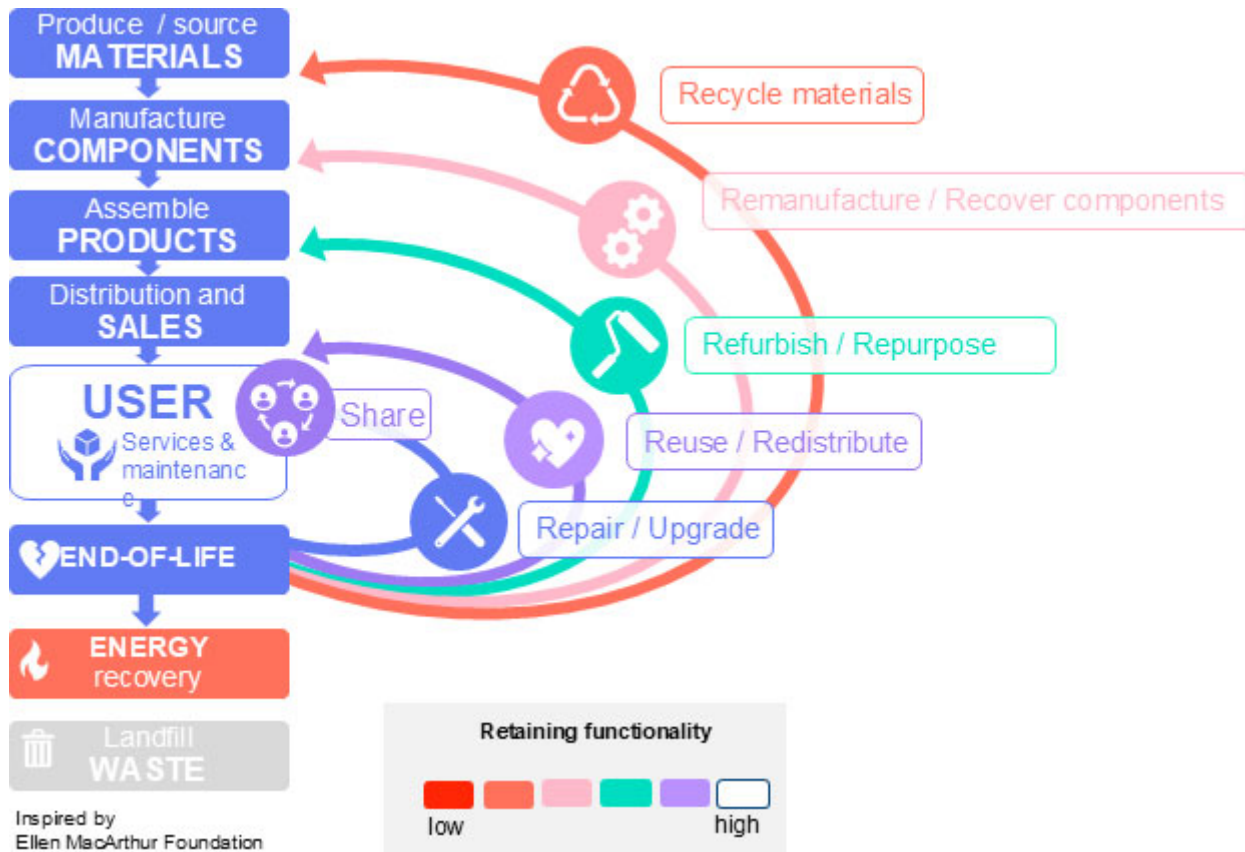
Why circular strategies matter

There is a lot of potential in machine building for preserving the technical and functional value of machinery. Circularity helps you reduce environmental impact and strengthen your revenue model by keeping machines productive for as long as possible.

Three ways to retain value:

1. **More and better use of machines:** more output through leasing, sharing and optimal use

2. **Extending life:** keeping machines operational with services such as maintenance, repair and upgrades
3. **Extending rotation:** putting end-of-life machines back on the market through reuse and remanufacturing



Overview of circular strategies for machinery: the closer to the centre the circle, the more added value is retained.

Three circular case studies from the Living Lab project

In Living Lab project Circular Machine Building, we analysed machinery designed by 3D Tools, CYAGO and Eliet. Each company explored circular strategies appropriate to its market, technology and growth stage.

1. 3D Tools: modular design combined with a buy-back model



The Gravifill machine from 3D Tools: a semi-automatic filling machine with a modular design for efficient use, easy maintenance and reuse.

3D Tools designs and builds customised machinery and launched the Gravifill, a semi-automatic filling machine. From the start, the focus was on modularity. Fewer variants reduce assembly time, simplify maintenance and enable reuse. The company also considered the environmental impact when choosing materials and treatment processes.

3D Tools now offers a formal buy-back service and sells machines to its customers that have been put back into working order. To gain insight into usage and services, the company equipped some customer machines with cloud-based data logging. This data helps to develop data-driven advice, estimate machine loads and assess condition before repurchase.

Circular strategies at 3D Tools:

- Reuse and remanufacturing thanks to modular design and buy-back
- Exploring efficient use of machinery by means of data

2. CYAGO: surveying customers before scaling up technology



Ronair machine from CYAGO used for drying bottles and based on energy-efficient fan technology instead of compressed air.

CYAGO specialises in drying and blowing solutions, with tailor-made systems for various applications. The use of fans means that these solutions consume less energy than compressed air-based systems. Due to the company's focus on customised engineering, achieving economies of scale in reusing the entire machine is still difficult. However, the machines share many components, providing opportunities for maintenance and repair.

CYAGO is now working to gain a better understanding of customers' activities so they can detect circular needs before extra technology is added. At the same time, the team is exploring modularity to support the reuse of components and adaptations at customers.

Circular strategies at CYAGO:

- Exploring repairs in the short term
- Reviewing remanufacturing potential on the longer term

3. Eliet: leveraging rental to create circular value



Jetzer, a new type of lawn machine developed by Eliet and offered to garden contractors through a rental model.

Eliet builds machinery for green space management and developed the Jetzer, a new lawn care machine. The company opted for rental to reach garden contractors. A rental system means fewer machines can deliver more functionality and enables market entry with strong circular potential.

Because Eliet designs robust machines, little modification is needed to the machines themselves. A digital platform supports the entire rental process. At a later stage, sensors and remote monitoring can be added. Eliet is already exploring these possibilities for servicing branch chippers, including through embedded diagnostic software and connectivity for data exchange. This allows the

company to support end users directly and keep machinery operational for longer.

Circular strategies at Eliet:

- Shared use via rental
- Maintenance and repair supported by digital tools

What machine builders can learn from these case studies

Although each case is unique, all three companies show that circular potential is always linked to new or improved services. With buy-back, rental, usage advice or maintenance support, machine builders are shifting towards a combination of product sales and services that both keep machines alive longer and generate additional revenue.

Important insights for machine builders:

- Start from customer needs: collect feedback through surveys, visits and follow-up
- Standardise your offering where possible: this increases scalability and circular potential
- Use modular design: set measurable design goals
- Address lifetime issues at the root cause: consider all life phases during design
- Collect the right usage data: essential for efficient repair, reuse and remanufacturing
- Start small with data and software: start with a proof-of-concept on one machine
- Validate solutions with stakeholders: choose the simplest solution that works
- Roll out new technology step by step: start with the function with the greatest potential

Ready to start circular machine building yourself?

The cases of 3D Tools, CYAGO and Eliet show that circular principles create added value for both customers and companies. At the same time, they make it clear that additional circularity requires closer cooperation with users and strong support services. With clear priorities and targeted improvements, circular machine building becomes feasible for any manufacturer.

As a machine builder, do you want to extend the life of your products and explore circular strategies?

Contact [Pieter Beyl](#) or [Thomas Vandenhaute](#) to discuss your next steps.

More information about the project: [Circular Machine Building | Designregio Kortrijk](#).

Read more on Sirris.be

- [Circular machine building: digital solutions for machine maintenance](#)
- [Remanufacturing of energy-consuming products: a smart idea?](#)
- [Circular innovation in practice: Sundo and OptimaT join forces with the SMOTspot](#)

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