



PRESENTING

Circular Economy Initiatives and Challenges

Examples aligned with ISO standard for Circular economy: 59010



- The following ISO standards for CE were recently released (in 2024)
- 59004:2024 Circular economy – Vocabulary, principles, and guidance for implementation
 - 59010:2024 Guidance on the transition of business models and value networks
 - 59020:2024 Measuring and assessing circularity performance



8 pillars in ISO 59010	Relation to the 10Rs	Examples
1. Functional approach	<i>Redesign, repurpose</i>	Sandvik, IKEA, VOLVO, SCANIA
2. Circular eco-design	<i>Redesign, refuse, reduce</i>	VOLVO, SCANIA
3. Resource management	<i>Recycle, reduce, reuse</i>	IKEA, Sandvik, Tetra Pak
4. The extensions of the life cycle	<i>Repair, reuse</i>	IKEA, Sandvik, Tetra Pak, Astra Zeneca
5. Responsible use	<i>Reduce, Reuse, repair</i>	ALFA LAVAL, Tetra Pek
6. Reverse Logistics	<i>Refurbishment, Remanufacture</i>	SANDVIK, VOLVO
7. Industrial symbioses	<i>Recover, recycle</i>	Tetra Pak
8. New life of products and materials	<i>Reduce, Redesign</i>	Sandvik, Volvo, IKEA



Practical examples – Introducing CE in Strategy and Vision



Examples of SACC members that has introduced Circular Economy in their Strategy/Vision

- IKEA: Achieving zero waste by 2030 and ensuring all our operational waste is reused or recycled while utilising circular solutions in our business providing circular services to our customers
- Astra Zeneca: Incorporate the principles of circular economy into the design of all our processes and products, from initial research and development through to production.
- Sandvik: Our purpose is to make the shift and advance the world through engineering. We have a unique contribution to make in helping to create net zero, circular and regenerative world

Practical examples 1 & 2 Functional approach and Circular Design



New Eco-design Sustainable Steel, Net Zero (pillar 2)

- Electric trucks/cars. Emissions tank to wheel are 100% reduction of CO₂. Batteries are not recyclable in Australia! Wacol is introducing a new production line for Electrical vehicles at Wacol (Brisbane)
- VOLVO Group International has collaborated with Swedish industry (steel maker SSAB/ABB etc) and was the first in the world to produce a fossil-fuel-free steel vehicle in Sweden. This was done through the help of harnessing completely new technology creating fossil-free electricity through Hydrogen to produce the steel. This eliminates up to 90% of the CO₂ emitted when producing steel.



PAAS (Product as a Service) pillar 1

- **Scania** has a Truck Rental service in Sweden, it is possible to rent your truck instead of buying a truck.
- **Sunfleet**, is a car-sharing service operated by Volvo Cars since 1998. It has a subscriber base of around 50,000 people, and its services have facilitated over 250,000 transactions in over 50 cities across Sweden. It provides on-demand access to cars and services through an intuitive mobile app.

Switching to digital business cards (pillar 2)

Around 100 billion business cards are produced every year, with 90% ending up in the bin. SJ Group (SMEC) introduced Digital Business Card in 2023. This saves trees and reduces the use of energy, water, chemicals, and pollution.

A simple step in the right direction,
Everyone can do it!



Practical examples: pillar 3, 4, 5

Astra Zeneca: Circular Food (pillar 5, 7)

Enabling zero waste from soya beverages: The production of soya beverages typically achieves a 60% protein yield – turning 1kg of soya beans into 7L, tetra pack has increased that to 12L.

Upcycling the food side stream – from beer and barley to a functional beverage: 40 million tons of brewers' grain end up as animal feed or landfill. Tetra Pak is upcycling this to use in the food industry. Next-generation plant-based drinks!
Reducing waste and creating a better food waste system.

IKEA: Reduce food waste (pillar 3)

IKEA recycles food waste and coffee grounds. Using Food Waste Watcher initiative uses AI cameras at food disposal areas to allow tracking of food waste. Since it was introduced in March 2021 15% of food waste has been reduced across Australia's stores.

IKEA: Love it Longer (pillar 4): Alongside their services to reuse and recycle, IKEA encourages their customers to Love their products for longer to reduce the impact on the climate. To do that IKEA has a modular product range and sells different components separately. Individual parts and spare parts can be repaired or replaced, single pillow inserts, get extra shelves, etc to allow keeping the furniture loved longer, rather than be replaced with new items.



Alfa Laval: Responsible use: Water for Zero Liquid Discharge (ZLD) (pillar 5)

Fermented beverages, like for example beer, demand substantial quantities of high-quality water to maintain product safety and consistency. Treating incoming water is essential to meet stringent specifications for both ingredient and production water. Processes like ion exchange softening and reverse osmosis, however, produce saline wastewater that poses environmental discharge challenges. Zero Liquid Discharge (ZLD) technology is a crucial solution for recovering valuable water from waste streams and minimizing waste volume. Implementing ZLD can significantly reduce water use in food production, shrink the water footprint, and enhance the sustainability of products, especially in water-scarce regions.

ABB: Eliminate food waste during manufacturing process (pillar 4)

ABB Active Voltage Conditioning (AVC) technology protects industrial and large commercial operations in environments where an unstable network or utility voltage affects productivity. Minimises unwanted downtime and eliminates food waste occurring at these incidents. **Payback** is achieved within several months of commissioning.

ABB also takes an active part in electrifying Australia and rolling out Electrical Vehicle Charging stations to charge Evs.



Water recovery



Energy efficiency



Payback time/Cost savings

Practical example (Pillar 3, 4, 5): The circular economy of batteries



Astra Zeneca: Resource efficiency during manufacturing, responsible use: Pillar 3 & 5

Maximise waste through reuse or repurposing of waste materials. In their manufacturing plant, all PE granulate waste is sent to third party for reuse.

Seeks to minimize the amount of materials required and waste generated in production and business operations. In Sydney, they have reduced their water use in operation by 65% by reducing and recycling water where possible.

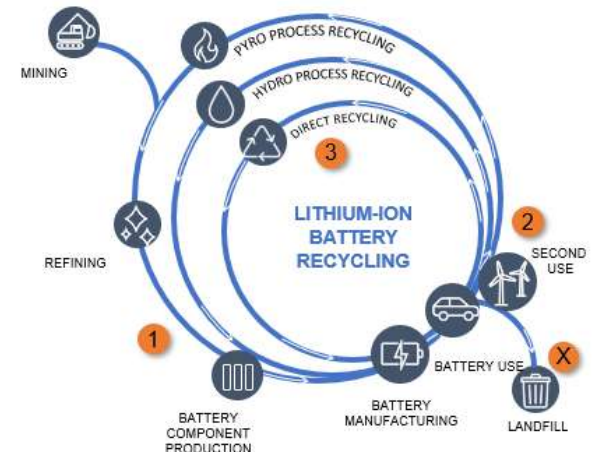
Regenerate nature by planning and ensuring the long-term survival of 2090 million trees by 2030.



Volvo Trucks/Sandvik: EV Battery Recycling VOLVO (Pillar 3)

Both companies are looking at the process of transitioning over to Electrical Vehicles. The process they are both pursuing is to 1) Include recycled content in new battery manufacturing, 2) reuse EV batteries (second use) at its 3) end of life (which can prolong their life length via second usage to ensure that recycling reprocessing opportunities are available by the end of that second lift.

Picture sources from Sandvik's presentation.



Tetra Pak: Certified Recycled Polymers(CRF) (recycled content): Pillar 3 & 5

Launched the first cap for beverage cartons with CRF in 2022, In 2023 Lactalis Group sold organic ambient liquid cream in Tetra Brik® (France)

Swiss dairy market introduced the first carton package containing CRF



Practical Examples: pillar 5 & 6



Tetra Pak: Renovating Machinery to extend lifespan (pillar 5,6)

In the Tetra Pak Certified Renovated Equipment Initiative, they refurbish equipment and remarket it. Providing existing and new clients with more options. 2021-23 successfully renovated and remarketed around 150 filling machines and 240 distribution equipment. This equated to 15% of sales in this category!

Tetra Pak currently have four refurbishment centers worldwide, and offers services such as restoring missing parts, installing upgrade kits to avoid obsolescence, and removing corrosion and rust, to allow the equipment to be kept in use for longer. In 2023, 133 certified renovated pieces of equipment were delivered compared to 106 in 2022.

Maintenance Units: Services Business Process: 'Maintenance Units' is a globally established concept that simplifies the handling of parts and maintenance and improves the customers' operations by increasing uptime and reliability. Providing high-quality refurbished units ensures an efficient maintenance event by saving time and reducing complexity. When a customer buys a refurbished unit, the old one is sent to one of their workshops to be dismantled and cleaned.

During the refurbishment process, old and new parts are put into a refurbished maintenance unit which is then sold to another customer. The reuse rate of the parts is, on average, 50%.



SANDVIK: Digitalizing/End of Life Equipment, (pillar 5/6)

Sandvik is digitalizing its buyback program process to make it easier, quicker, and more transparent to recycle carbide material..

Sandvik offers an end-of-life equipment recycling program for its customers.

So far 94% circularity has been achieved from our local end-of-life equipment recycling program. One important aspect of this program is that Sandvik also recycles competitor equipment as trade-ins (in addition to their equipment) from the program.

Recycled materials are Steel, Tyres, Batteries, and Glass.

Reverse logistics VOLVO (pillar 4/5/6)

Calculate and plan transport (including CO² measured) so that backloading (i.e. reverse logistics) can be used.

Example VOLVO trucks (trucks one way and salt bags the other way back)

Enabling second-hand use by remanufacturing and refurbishment of engines, packaging (wood pallets) until at the end of life it gets composted/mulched

Practical examples: Pillar 7 & 8



Tetra Pak: Upcycling, SaveBOARD (pillar 7)

Last year Australia's first food and beverage carton recycling facility, saveBOARD opened in New South Wales. This is a significant milestone and will recycle both TetraPaks cartons as well as coffee cups. This facility will remanufacture the entire carton into low-carbon construction materials for homes and offices, without using any additional water, adhesives, or chemicals, making it a truly sustainable product.



IKEA: Furniture Buy-Back Service at IKEA (pillar 8)

Customers have the unique opportunity to return their eligible pre-loved IKEA products to the Buy-back service. In return, customers are offered an IKEA Refund card of up to 50% of the returned product's original value. Products returned through the Buy-back service are resold in our As-is area in-store or online or donated to community projects for those in need. The As-is section is located before the checkouts in every IKEA Australia store. Through this service, over 65,000 IKEA products have been given a second

What second-hand IKEA furniture does IKEA Buy-back?



Sandvik: Remanufacture (pillar 8)

Recycling program for all rock tools (free service) to ensure worn-out tools are not going to waste.

- Reduce CO2 emissions when recycling as much as 64% compared to virgin material mined.
- We use ~75% less energy when heating our drill bits with local extraction.
- We will ship 93% less weight to our facility in Austria



VOLVO TRUCK: Remanufacturing (pillar 8)

Old engines and clutches are sent overseas to be refurbished or remanufactured and reused back in new trucks. VOLVO is looking into relocating remanufacturing/refurbishment to Australia (Melbourne)



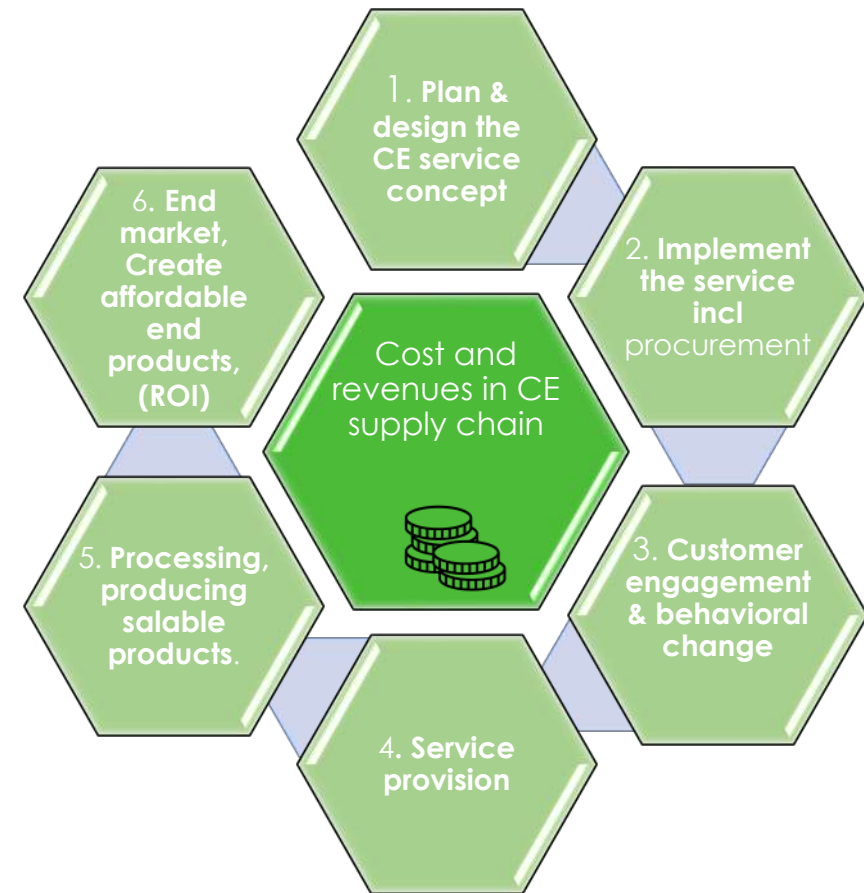
Key hurdles and barriers

- Financial hurdles, it costs to invest in new products, new design, R&D
- Regulatory: Not enough drivers to change (stricter regulations, financial incentives)
- Not enough collaboration, hard to identify industrial symbiosis, networking with like-minded to enable and create partnerships.
- Confusion on what is CE and Sustainability (messaging) Uncertainty about where to start, Time is money!



CE business model equals a shift to long-term financial gains

- Community context to provide incentives to create **WIN-WIN** solutions along the supply chain
- **Business to innovate and Evaluate CE opportunities** and define the scope to achieve long-term financially viable results
- **Measure** and **Review** outcomes according to set targets (KPIs) and a governance framework that identify success/failure
- **Collaboration** can be a key enabler (seek partnerships, network with likeminded)





Circular Economy principles are cross-functional – collaboration is key

Circular economy is a systematic shift that designs out all unnecessary waste, and keep all other waste generated recirculated back at its highest value at all times until it, at the very end the waste that occurs is recycled back into the system again.

1. Circular Economy is **cross-functional**; all systems are **designed** to create a circular system from the start (design phase), this will effectively drive change and prevent linear systems from being designed/ constructed.
2. Collaborate across disciplines (digital, technology, energy, water etc)
3. Behavioral change is required on an everyday basis, can be triggered by human-centered incentives/programs as well as new policies and frameworks to drive change at the business level - make it easy for a business to do the right things)
4. Business models must be adapted so that the (economic, social, and environmental) value of **CE activities are quantified**
5. Copy and paste from existing examples



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