Circular Design Guidelines

storaenso

We at Stora Enso believe that renewable, recyclable materials are the way forward for a sustainable future. The Stora Enso Circular Design Guidelines outline our commitment to contribute to a circular bioeconomy through our products and solutions. They focus on circular economy and are complemented by other relevant policies, guidelines, and instructions that Stora Enso complies with (more information can be found for example here).

Core circular design principles

Our core circular design principles are leading us on our way towards a circular future. These principles are the foundation for how we look at circular design across our divisions and functions. We constantly work at integrating these principles into our processes, acknowledging also that this work concerns both us and the full value chains we operate in. With the circular product ecosystems further evolving, the principles are regularly reviewed and updated when needed.

Design for renewable materials

Making the sustainable choice from the start

In the bio-based sector, we are privileged to work with unique renewable and recyclable materials from our forests. On the road to circularity, we explore the growing potential of the bioeconomy and minimise the use of non-renewable materials. In our work with sustainable forest management, we maintain carbon storages, reduce reliance on fossil materials, and thereby combat climate change while building a more sustainable society.

Design out waste

Using less resources for producing a product

Our long-term circular economy commitment is to maximise the value of material streams, to achieve the required functionality with as little raw material input as possible and to work towards zero process waste. This is achieved by emphasising and promoting circular material flows in our value chain and by maximising the net value of waste and residuals while reducing waste to landfills to close to zero, whenever legally, technically and commercially possible and environmentally beneficial.

Design for functionality

Ensuring that products meet customer needs

Customer needs are the starting point for all our products. With in-depth customer understanding and a close relationship with the customer, we are able to design our products to be functional and valuable throughout their lifecycle. Designing products that are also durable for the intended function is also a key principle of our circularity approach. Key to functionality is to consider both the circularity aspects of a product and the circularity aspects that the product enables through its function.

Design for recycled materials

Innovating uses for valuable recycled materials

As recycling of products and materials develops, we are offered a great opportunity to utilise the recycled material in novel ways. Finding new applications and possibilities in designing with reused and recycled materials keeps the value of those materials in the system, reducing waste and the use of virgin materials.

Design for recyclability
Choosing materials for their ability to be recycled

To support the recyclability of a product at its end-of-life, its material components must be designed accordingly from the beginning. Stora Enso, together with its partners, explores ways to choose and combine materials for separation in available recycling processes. Designing for recyclability involves the wider value chain, meaning that we look into partnership and collaboration as a means to contribute to future collection, sorting, and recycling infrastructure, technology, and awareness.

Design for circularity of the full value chain
Driving circularity together with our partners

Transforming to circularity does not happen overnight or in isolation. Stora Enso works with its partners to create circular solutions throughout our value chains. This means working with partners, customers and other stakeholders to identify possibilities for circular material flows and maximising the net value of materials. Designing for the circularity of the full value chain means designing for higher connectivity of data, devices, and partners, often enabled by digital solutions.

Design for circular business models
Building a circular value logic

Circular design includes opportunities for new circular business models – designing the business model, not solely the product, based on the intended function. Where business models build on value capture, circular business models aim to optimise the value logic throughout the lifecycle. Typical circular business models include circular sourcing, novel products from side streams and a broad range of service business models: leasing, take-back system, product-as-a-service and solutions and services that enable longer lifecycles, for instance repair or recycling services. As with value chain circularity, digitalisation also plays the role of a key enabler in circular business models.

Further circular design aspects

In addition to our core circular design principles, there are also many other relevant circularity aspects. These may be more relevant to certain products and solutions than others – and these may play a key role in the future development of circular economy in our value chains.

Design for upgrading, modularity and compatibility
Envisioning the future needs of customers and product systems

Designing for products to be updated during use both extends their lives and saves users' resources. Modularity, on the other hand, allows for products and their parts to be used in different product systems over time. For example, construction is becoming more circular as modular building solutions enable multiple uses for building elements during their lifecycle. Finally, by designing our products for compatibility with other products and systems, we prepare for our customers' changing needs and ensure that materials hold their value.

Design for long life use of products
Extending product lives

To design for a product's longer life starts with understanding how it will be used and what functions it could serve at different use phases. By envisioning the ways in which a product can be used, which needs its users may face, and what requirements these uses pose on the product, we can design longer and longer life uses for our products.

Design for reuse, repair, refurbishment, remanufacturing
Enabling product maintenance and longer use time

Circular design may also be used to plan how products can either be reused as they are or maintained for extended use. Where relevant given the function of the product, we are also challenging ourselves to analyse the potential for reuse, repair, refurbishment and remanufacturing. The goal is for our customers to continuously benefit from the high value of bio-based materials with ease. In addition to our commitment to explore these possibilities within the biological loop, these final principles are already integral in how Stora Enso handles the longevity and sustainability of our facilities.