

DANISH CIRCULAR INDUSTRIAL DESIGN

Crafting Circularity

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FOREWORD

Design is in the midst of a time of change. It can be felt in the profession, in education and in companies, where the demands for change are growing rapidly. It is no longer just about shaping products and services, but about rethinking design throughout the entire value chain – from idea and development to production, use, repair and recycling. In short: the designer has moved from being a shaper to a co-developer of entire systems.

In Denmark, we are meanwhile facing a paradox. We have one of the world's strongest design traditions and unique competencies within industrial design, but according to the Circularity Gap Report Denmark (2023), our economy is only 4% circular, which is among the lowest in Europe. At the same time, EU regulations, resource scarcity and businesses are pushing for more circular, robust and responsible solutions. Denmark has a special design position, but we have not yet managed to translate it into the circular practice of the future.

"In Denmark, there is a great opportunity to restart our historical Danish design heritage with a renewed focus on circularity, responsibility and, naturally, quality."

– Julie Hjort, COO, DDC

With this publication we want to set the stage for the circular transition within Danish industrial design. Here you will gain insights into:

- why we need to redefine industrial design in a circular context as a position of strength for Denmark
- why the connection between design education and business needs to be strengthened
- and which seven agendas the Danish Alliance for Circular Industrial Design (DACI) points to as central landmarks for a new Danish and circular design future.

These agendas are shaped in close dialogue with the members of the alliance – designers, companies, researchers and decision-makers – and are based on interviews, practical insights and concrete experiences from the field.

DEFINITION OF THE TERMS

Here we use the term industrial design in a broad sense: From furniture, interiors and textiles to electronics, medical equipment, means of transport, kitchen equipment and other products that are mass-produced and used in industrial and commercial contexts. A width that also reflects the complexity of the field: circular economy is as much about systems, materials, technology and regulation as it is about human needs, behaviour and aesthetics.

Our mission is not to provide the final answers. Quite the contrary. This publication asks more questions than it answers.
We must begin with curiosity, with courage and with the recognition that design has both been a co-creator of the problem and therefore, at the same time, can become a central part of the solution(s).

A circular future requires everyone to be involved: companies, education, consumers, politicians – and designers. Designers should not be able to do everything or bear all the responsibility alone. But the designer's practice and approach can help open up new paths, ask the right questions, challenge established systems and create concrete alternatives in a time where change is no longer a choice but a necessity.

Crafting Circularity is the beginning of a joint effort. A project that, through communication, activities and the establishment of the DACI alliance, has set the direction for a long-term initiative. This publication is a first step: a collection of problem areas, opportunities and curiosities that can guide us further. Throughout the publication, you will encounter quotes from the members of the alliance (DACI) to make the voices of both the designer, the company and other actors in the landscape visible.

We will write the next chapter together. Because even small initiatives can change something – and big changes often start in the smallest and most dedicated communities.

Enjoy the read.

Best regards,

Therese Balslev
Co-lead & strategic designer
Products & Materials
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On behalf of the partner group behind the Crafting Circularity project:
Aalborg University, Design School Kolding & The Royal Danish Academy.

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If we are to be circular, we must be united about it – and design has the ability to bring together the different disciplines around a common agenda.



Linda Nhu Laursen
Associate Professor, PhD &
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DANMARK AS A PIONEER COUNTRY?

Danish design is often considered to have a unique position in the world. What makes Danish design special is that several different things work together at the same time to create recognizable and long-lasting designs. Danish design is often based on user needs with a deep understanding of the people who will use the product and the situations in which it will function. Whether it is a ticket vending machine or a deposit system, good Danish design is about solving real problems with well-thought-out solutions that combine function, user needs and aesthetics.



A QUESTION OF METHODOLOGY, NOT JUST MATERIALITY

When we talk about Danish design, many people think of stainless steel and oak materials that can age beautifully and last for generations. But the strength of Danish design does not only lie in the materiality. It lies in the methodology: a design understanding inspired by, among other things, Japanese principles of taking your time and making an effort, combined with Danish thrift thinking and a love of the indestructible.

The design process is complex and iterative. The concept starts with the user, but at the same time, production, economics, logistics and material selection must be matched and choices made and rejected must be balanced. This requires an ability to keep many tracks running at the same time – a holistic balance that has become a core Danish competence within conceptual design thinking.



TIMELESS ELEMENTS IN A MODERN CONTEXT

The fundamental elements of Danish design are timeless: openness, honesty, human scale and a focus on quality of life. There is an intuitive understanding of quality in the culture – an aesthetic tradition of durability and a love of logic and practicality. Danish designers have a zeal for orderliness, which is also reflected in the approach to waste sorting and resource management. It is this 'aesthetics for lifespan extension' that makes the difference: Beautiful things last longer because we cherish them.

“It’s not just “form follows function”. Form and function are equal.
When function also follows form, the lifespan of a design is extended”

–
Pil Bredahl
Self-employed designer

DANMARK’S UNIQUE POSITION
As a small country, Denmark has structural advantages that make us an ideal testbed for circular solutions. In many places, trust-based collaboration is practiced, in some places without heavy contracts and where NDAs are not necessarily involved. In Denmark, flat hierarchies and a culture of association are present in several places, which can make it easier to have influence and create change.

But there are also limitations. Denmark is too small to master all competencies, and there may be a lack of sophistication in certain areas. And although Denmark tends to be less afraid of failure than some other countries, this risk aversion can still hold us back.

THE POTENTIAL: CONNECTING THE WASTE STREAMS
Yet, Denmark is in a unique position to become the design nation that truly connects material flows and waste streams. There is much evidence that we have the skills to integrate circular material flows without having to compromise too much on functionality. We need to think “before and after” already in the design process. We need to think about where the residual materials will go and who to collaborate with.

This is where Danish industrial design can help make a difference - by showing that circular design is not only possible, but that it can help create better products.

“One of the things we have been good at in Denmark is making production methods meaningful through design. This is where the icons are created.”

–
Linda Nhu Laursen
Associate Professor, PhD & Research Leader in design, Aalborg University

INDUSTRIAL DESIGN IN A CIRCULAR ECONOMY

Industrial design is about shaping products that are produced on a larger scale and used in many people's everyday lives; from furniture, electronics and kitchen equipment to pumps, machines and technical components in industry. Common to these widely different categories is that they must be mass-produced, and that the designer works in the tension between craftsmanship, technology and industrial production processes.

"Danish industry is operating – they produce and keep the wheels turning. But sustainability is an innovation agenda, and it takes courage to dare to innovate."

- Peter Byrial Jensen, PhD, Product Lifecycle & Circular Business Models

An industrial designer is often involved from the first sketches to the prototype that can later be produced on a certain scale and function in practice. This requires the ability to think in iterations, test ideas and understand both function, aesthetics, materials and the production forms that can bring the design to life. The designer navigates complex trade-offs between form, function, user needs, economics and production technical realities.

In the circular transition, the designer is given an expanded role. Here, design is not just about creating a product, but about thinking in systems, life cycles and long-term value creation. Consideration must be given to how materials can be kept in circulation, how products can be disassembled, repaired and upgraded and what services and collaborations will support their lifespan. The industrial designer thus becomes an important link between technology, business, user needs and circular strategy – someone who can translate abstract goals into concrete solutions.

Regardless of whether a lifestyle product or an industrial tool is being developed, the task is therefore the same: to create solutions that both work today and can continue to create value tomorrow.

Circular design is not an add-on – it is a given if you want to create very good design.



Peter Byrial Jensen
PhD, Product Lifecycle & Circular Business Models

THE VISION FOR CIRCULAR INDUSTRIAL DESIGN

At the Danish Design Center, we believe that the time is ripe to relaunch our proud Danish design tradition, but with new and more contemporary features that take into account the serious impact that planetary boundaries have on how we consume and use materials and resources.

The historical golden age of Danish design saw the light in the post-war period as a response to the poor living conditions with a strong intention to lift people from poor conditions to increased prosperity. This was done with a new interpretation of functionalism that showed that beautiful and durable Danish design could be accessible to the broad middle class.

Today, the designer's response must necessarily be different. Here, the creative constraint is rather to explore how the designer, with care, quality and creativity, can encourage more responsible consumption and design products and solutions that enable a more attractive and sustainable lifestyle.

Relaunching industrial design today does not come by itself. Therefore, work is being done to support a new vision where:

— The Danish design industry is united behind a strong and common direction and ambitious vision for industrial Danish design.

— The Danish design community leans into new collaborations, joint interdisciplinary exchanges of knowledge and experience. The industry can help create good frameworks for new thinking, innovation and courage that utilize the breadth and interdisciplinarity of the design profession to the fullest.

— Design actors proactively involve themselves in interdisciplinary environments with industry, authorities, educational institutions and experts in order to become active co-creators of new solutions.

— That we in Denmark manage to concretely and appealingly make visible the central roles that industrial design plays as a necessary position of strength for Danish business and for sustainable transformation, which inspires even more people to engage in industrial design.

Good Danish industrial design has always been about combining function, aesthetics and material quality – and daring to think in new ways. It is the dream of doing something better that is in our DNA as designers.



Christina Halskov
Halskov Design Studio

DESIGN IS THE KEY TO THE EU'S FUTURE – AND DENMARK SHOULD LEAD THE WAY

Denmark needs a contemporary design policy, as our unique design tradition can be part of the solution to pulling Europe in a direction that offers to be part of a solution to the EU's three strategic challenges.

Denmark has just taken over the EU presidency. This comes at a time when Europe is facing a strategic trilemma: We must strengthen our competitiveness, implement the green transition and at the same time ensure resilience in a geopolitically unstable world.

The challenge is not to aim for one of the goals – but to realise them all at the same time. Historically, the EU and its member states have tended to focus on one goal at a time. Growth after the financial crisis, climate after the Paris Agreement and most recently security in the wake of the war in Ukraine and the presidential election in the USA. But today, the complexity of our challenges demands something different.

At the Danish Design Center, we believe – like the European Council – that the solution lies in investments in innovation and in the ability of companies to develop attractive, resource-conscious products and solutions that reduce our dependence on global supply chains. But how do we ensure a European business community that can take on this task? The answer lies in our Danish design heritage.

In Denmark, we have a unique design tradition. We are recognized for our ability to design with the user at the center, consideration, quality, ethics and a special sense of materials and craftsmanship, which back in the 1950s put Danish design and Denmark on the world map. But since the 50s, the design profession has developed significantly. Design today is not only about products –

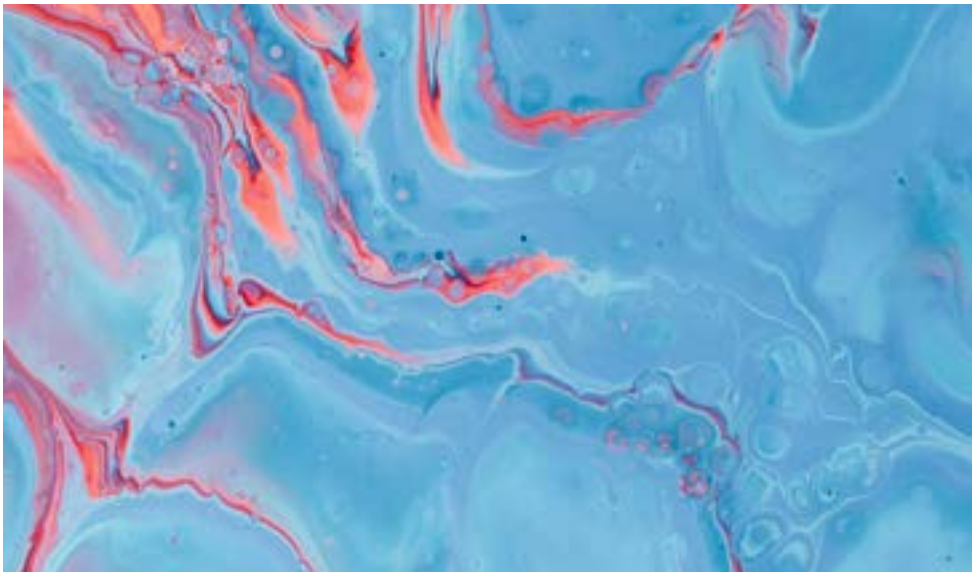


Photo: Pawel Czerwinski

but also about services and processes that drive development in the right direction.

Today, design is just as much about creating system changes as it is about shaping products. One example is Fredericia Municipality in Denmark, which, with the help of design methods, has developed a partnership where wastewater, energy and infrastructure are considered together – and where the water in the city is used more resource-efficiently and circularly. The solution is not just technical. It is designed across domains and needs.

Design also plays an important role in the development of services – digital products, public authorities and shared urban spaces that meet human needs. Service designers have contributed to the development of responsible, intuitive, digital platforms such as sundhed.dk and MitID and apps for services such as Clever and Pleo. Denmark's position as one of the world's most digitalized countries is precisely due to well-designed solutions that are based on what makes sense to people – and this strengthens users' ability and confidence to use them.

Design is about turning industrial production from a linear business model, where used materials are discarded, to a circular model, where products are designed to be resource-efficient and climate-neutral. One example is the Danish company a:gain, which designs and produces building materials from consumer and demolition waste, industrial production residues and discarded production. When up to 80 percent of a product's environmental footprint is determined already in the design phase, it becomes clear how much of a difference design can make. The earlier designers are included in the process, the greater the value it creates – for the business as well as for the climate.

When design creates value, it is very much related to how it is used. Are design decisions made at management level? Are design thinking and methods integrated into the business strategy? Are designers part of the development team? Or is design just the finishing touch that makes everything look a little nicer? The more strategically design is used, the greater the value it provides, shows the new national business survey Design Delivers 2025, in which 600 Danish companies having more than 10 employees participated.

The survey was carried out by Megafon for the Confederation of Danish Industry and the Danish Design Center.

The figures from the survey speak for themselves. 9 out of 10 companies that use design experience that design strengthens their competitiveness, 8 out of 10 companies experience that design strengthens their ability to find new solutions and business models – and even increases their financial bottom line. Two out of three companies experience that design helps them to improve resource efficiency.

But far too many Danish companies miss out on the added value that design can create. Two out of five companies do not use design at all or only use design to refine the product's expression. The majority of companies, which are so-called non-users, consider design irrelevant – despite the fact that they demand exactly the skills that design contributes: development of products, services, customer insight and digital solutions.

In Denmark, we are proud of our design heritage and our internationally recognized designers. But unfortunately, our reputation and global influence rest on prehistoric design policies and on the furniture classics we introduced in the post-war period. If we want to maintain and expand Denmark's position as one of the world's leading design nations, we need a contemporary design policy that promotes the use of design in both business and public systems.

Our latest design policy came out in 2007 – the same year the first iPhone was launched. In the meantime, many countries such as Finland, Ireland and Singapore have developed ambitious, up-to-date design policies – many even with Denmark as a role model. It is time for us to take the lead again.

It is obvious that Denmark should use the EU presidency to put design on the agenda – and to formulate a new, future-oriented national design policy. We do not believe that design will solve all our problems, but we know that design gives us the ability to think holistically, problem-solving and with people's needs at the centre.

Every decision, every investment and every political reform should be measured by whether it brings us closer to all three goals in the EU trilemma. Design has precisely these qualities – it just requires that we use them. A design policy is an important step towards taking advantage of that potential.

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Photo: Fanette Guilloud

APPEAL TO POLITICIANS AND BUSINESS: YOUNG DESIGNERS CAN DO MORE THAN YOU THINK

Our design education programs are once again undergoing reforms to make them more business-oriented. But do our politicians even know what we are teaching? And how much does the Danish business community actually needs those skills?

Design is in a time of transition. This is clearly felt both in the design profession and in the design education programs, which have met significant demands for change in recent years. At Aalborg University (AAU), Kolding School of Design (DSKD) and the Royal Danish Academy (DKA), the latest graduate reform, which aims to bring graduates closer to the business world, gave rise to reflection. Because as is often the case with political reforms, even with the best intentions, someone has forgotten to ask the design education programs themselves what they are actually doing to build good bridges between the new talent pool and their future workplaces. For example, it has escaped political attention that at all three institutions (and other similar ones) companies are involved to a very high degree in various internships, education and alumni programs within industrial design – here understood as a broad range of product categories that are mass-produced and are part of industrial and commercial contexts, i.e. both interior design, fashion, furniture, textiles, ceramics and glass, but also industrial design such as electronics, medical equipment, white goods, means of transport, kitchen equipment and so on.

During all semesters of the Master's degree in Industrial Design at Aalborg University,



Photo: Alex Shuper

students collaborate with companies – the few who do not start their own businesses. Within various types of industrial design at the Kolding School of Design and the Royal Danish Academy, external partners are associated with the vast majority of courses, which are intensified during the course of the education. Understanding and linking production, the market, the user and the planet is the prerequisite for the design education.

A great deal is already being done by educational institutions to develop education in interaction with the needs of society, including businesses. Yet it seems that politicians are less aware of what is actually being taught and how it can benefit businesses. And perhaps that is precisely why there are recurring political ideas about what our graduates can do – but also, to a greater extent, what they cannot do. Therefore, with this paper, we would like to take the opportunityto tell you what our education is about and why.

From a previous focus on designing useful and aesthetic objects, the sustainable and circular transition has fundamentally changed the role and practice of the designer. Today, design education is still about materials and design, after all, we are making physical products. But it is also about understanding complex systems and navigating the intersection of technology, ethics and politics, thereby contributing to the green transition of society.

Designers must operate in a complex world where production and markets are often globally distributed and still defined by an old paradigm: mass production and linear consumption. At the same time, there are increasing demands that everything must be sustainable – both in material selection, production methods and life cycle. Circularity is part of the solution, but it requires re-design. No company can any longer dream of managing the entire value chain alone. Therefore, designers must be able to think in terms of collaborations, systems and long-term strategies.

Denmark has a special position of strength in this development. We have a tradition of products with a long lifespan and emotional attachment. Design of products that can be updated, repaired, reused and promote a sustainable transition. The students gain a thorough understanding of technical and economic conditions that have an impact on the lifespan of products as well as the properties and applications of discarded materials. In addition, they gain insight into consumers' dreams and needs and the role of design in new circular and sustainable business models. They gain an understanding of how design is part of political and legal requirements and new cultural narratives. These are all elements of the education programs' efforts to provide students with strategic competencies that can help companies and organizations in their transition work.

The competency profile of the graduates is necessarily very different from that of their employers, many of whom we have trained ourselves before there was such a thing as green transition, sustainability and circular economy.

That is precisely why, in our opinion, there is a need more than ever for business and education to have close and good cooperation. It is based on these thoughts that in the past ten years, the inclusion of real-life issues from private and public companies has been greatly increased when we teach design. And it is also based on these experiences that we want to invite both companies and political decision-makers more closely into the engine room of our education programs as part of the graduate reform. With the dream that in the future, our students will have a much greater opportunity to demonstrate that they can apply everything they have learned – because our companies and decision-makers will have a much greater understanding of the talented and competent young people we send into the design profession of the future.

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Photo: Fanette Guilloud

ARTICLE

WHAT DOES DANISH INDUSTRIAL DESIGN HAVE TO DO WITH CIRCULAR ECONOMY?

Circularity as a creative constraint for the design of the future.

Here you can meet three Danish companies, each of which shows how circular ambitions are translated into practice through material strategies, design decisions and the compromises that shape industrial design.

Circular economy is often referred to as a systemic shift, but in practice the change also occurs in the concrete: in the materials, in the choices companies make early in the design and development process, and in the principles that shape how products are created, used and live on.

When companies use materials strategically as guiding design principles – and not just as resources – circularity can function as an active and innovation-driven backbone. A backbone that affects the entire company – from design processes, production approaches to business models and relationships with users and customers. Material strategies can therefore function as concrete guidelines that makes it possible to translate circular ambitions into practice. Experience also shows that circularity is rarely particularly easy to implement. Even clear and simple material strategies unfold in complex systems where considerations of function, aesthetics, economy, regulation and user behavior must constantly be balanced. It is precisely in this field of tension that industrial design takes on a central role as a link between idea, material, production and use.

This raises a very central question: How can a country that is world-renowned for long-lasting design become a more active driving force in the circular transition through concrete material strategies?

Bang & Olufsen, oasicare and Søuld illustrate here how industrial design can be used actively to translate circularity from ambition into action - and why the path to that end is rarely linear, but always shaped by choices, opt-outs and compromises.

BANG & OLUFSEN: EVERYTHING SHOULD BE SEPARABLE

Bang & Olufsen is a Danish manufacturer of audio and video solutions with roots that go back to 1925. For a century, the company has united technology, aesthetics and craftsmanship in products that are created to last – both functionally, culturally and emotionally. Today, when the company has just marked its 100th anniversary, circularity has become an integral part of product development.

At Bang & Olufsen, Mads Kogsgaard Hansen, Head of Product Circularity, works to embed circular principles early in the design process across the company's areas of expertise. One key approach is to design products that can be easily and intuitively disassembled:



Photo: Chanhee Lee



Photo: Marcus Lenk

"We always start product development with a clear ambition that the product we design should be easy and intuitive to disassemble. The modular approach we use supports several different circular and value-creating elements such as service-ability, upgradeability, customization and reusability, which together with user interaction play a central role in extending the product's lifespan," says Mads Kogsgaard Hansen.

When disassembly and modularity are considered from the start, it opens up the possibility of repairing, upgrading and replacing individual components rather than entire products. This places high demands on design, material selection and collaboration across the organization - but at the same time it also creates completely new opportunities for the company:

"Modularity can do a huge amount for us. Instead of replacing an entire product, you can replace a single part. The same design choices can also help us prepare our products for a life after the first one. Modularity and serviceability also give us opportunities to offer attractive products on the secondary market of the future," Mads continues.

As part of Bang & Olufsen's circular strategy, they are also working to strengthen the emotional relationship between user and product.

“If we can get people to invest emotionally in our products, they are not quite so easy to replace. This increases the likelihood that they will repair instead of discard,” says Mads.

Putting modularity and replaceable components into practice is a complex task. For the company, it is also an investment - especially when you consider how much development time is spent. In general, it is much easier and cheaper to make a product that cannot be disassembled. As a user, you also pay for this and it can be seen as a long-term investment in many ways.

“We want to make slowness exclusive. It should not be seen as a compromise, but as a choice where you buy fewer things of higher quality and expect them to last longer”, Mads adds.

The long lifespan is therefore embedded in the design. Hardware and software are separated, so that physical components can be replaced. At the same time, the software can be updated continuously, so that the headphones keep up with technological developments.

OASICARE: MATERIAL OPTIMIZATION IN COMPLEX SYSTEMS

oasicare is a Danish medtech company that develops solutions to improve women’s health and quality of life. The company works with the prevention of ruptures during vaginal birth and designs products that are produced in large quantities and at the same time must meet strict medical requirements.

The strict requirements limit the company’s freedom to choose which circular strategies can be integrated into the products.

At oasicare, material optimization has become a central circular approach, as they have assessed that this is where they can make the biggest difference. The ambition is to work purposefully to reduce material consumption.

”When we design, we must use as few materials and as little of that material as possible. If we can remove just two centimeters, we will do it. On a million products, it has a big impact,” says Ditte Marie Fog Ibsen, Co-founder and CEO at oasicare.

The strategy may sound simple at first glance, but in practice it branches far into both development and production systems. Small design changes have a major impact on tools, processes and quality assurance, and require close collaboration across disciplines:

“This places great demands on the collaboration between product development and production to ensure that the requirements can be met,” explains Ditte Marie.

The example from oasicare shows how circularity is not only about recycling, but also about precision, responsibility and value creation over time - even in highly regulated and complex systems.

SØULD: NATURAL MATERIALS AS CORE

Søuld is a Danish materials manufacturer founded in 2010 that develops acoustically friendly building materials from eelgrass – a local and renewable sea plant with deep roots in Danish cultural history.

For over a decade, the company has collaborated with ecologists, manufacturers and designers to reactivate and further develop a more than 400-year-old material tradition known from the roofs of Læsø.

Søuld’s products are based on the natural material eelgrass and the product recipe is designed with full circularity as a focal

point. This makes the materials easier to recycle and supports an aesthetic where change and patina are part of the expression itself:

"At Søuld, we take our starting point from natural materials and all product designs are driven by a mindset where the products have an afterlife. One of the most beautiful things about natural materials is that they develop patina over time, and that things can be imperfect and have traces of time. Patina is beautiful – it shows that something is alive," says Tobias Øhrstrøm, Co-founder of Søuld.

The material strategy shapes both product development, aesthetics and business model. Søuld's products are used in both private and commercial buildings and combine acoustic, thermal and indoor climate properties with a sensory and tactile quality.

Here, the material becomes not just a resource, but an asset that connects circularity with architecture, well-being and biodiversity.

WHEN CIRCULAR PRINCIPLES MEET REALITY

The three company examples show how material strategies can function as a concrete and action-oriented entry into the circular economy. At the same time, they make it clear that circularity is rarely simple in practice. Even clear principles unfold in complex systems where design, production, business and use are closely linked.

This is precisely where industrial design can play a crucial role. The vast majority of companies that want to integrate circular initiatives into their products and business models will encounter complexity on their way.

In the three companies, circular strategies such as design for separation, material optimization and the choice of mono-materials and their natural changes over time are not considered obstacles. On the contrary, they are seen as consciously chosen creative constraints that hold the companies to the responsibility they have chosen to take and that are of decisive importance for the many decisions made in the development and production processes.

Design-driven approaches can act as a catalyst for the creative bottlenecks. Through iterative processes, interdisciplinary collaboration and ongoing testing, it becomes possible to translate circular ambitions into concrete solutions. Not as ready-made answers, but as a continuous design-driven movement towards more responsible and robust ways of creating value - even when the complexity is great.

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Photo: Søuld

ARTICLE

INDUSTRIAL DESIGNER: *I LEARNED TO SPEAK THE LANGUAGE OF INDUSTRY*

Young designers often face headwinds when trying to work sustainably. Industrial designer Matilda Blomgren Munk has experienced the barriers herself – and found the strategies to bring circular design into industry.

If you try to take a Bluetooth speaker apart, you will find that not all models are designed for repair. This is exactly what Matilda Blomgren Munk wanted to do during her bachelor's studies at Lund University of Technology. Here, in collaboration with Bang & Olufsen, she developed a Bluetooth speaker that could be taken apart, repaired and reused – with a replaceable outer shell, software that is easy to update and materials sourced from end-of-life products.

This set a direction for her further career: to find out how sustainability can become a real part of the industry. Later, she therefore took a master's degree in Design for the Planet from Kolding School of Design and gained a more strategic approach to working with sustainability.

MONEY TRUMPS THE PLANET

But already in her first job in the grocery industry, Matilda Blomgren Munk's dream of transforming the industry was challenged. The task was to make thousands of packages more recyclable and adapt them to new EU regulations. But the high price of the sustainable choice became a stumbling block.

"My role was basically all about circular design. But several times I was faced with the choice of choosing more recyclable packaging that cost ten times as much as the tax on a non-recyclable solution. It's hard to argue for – especially in an industry where every penny counts," she says.
The experience taught her that solutions

only make a difference when they make economic sense, and so she changed her strategy.

"I started to focus on finding the good economic arguments – that is, the cases where it actually made sense to change. In other words, I learned to speak the language of the industry. In most companies, money and growth come first, and sustainability often ends up as 'the last sprinkle' in a busy day of firefighting."
Matilda Blomgren Munk discovered that the good arguments for sustainability lay in the company's oppotunity to save money on materials – or to operate without certain products.

"It is important to remember to ask the question: Do we really need it? The most sustainable solutions, for example, often come from minimizing material consumption – or not producing something at all. There are various resources and tools that can help substantiate the right arguments."
Among other things, Matilda Blomgren

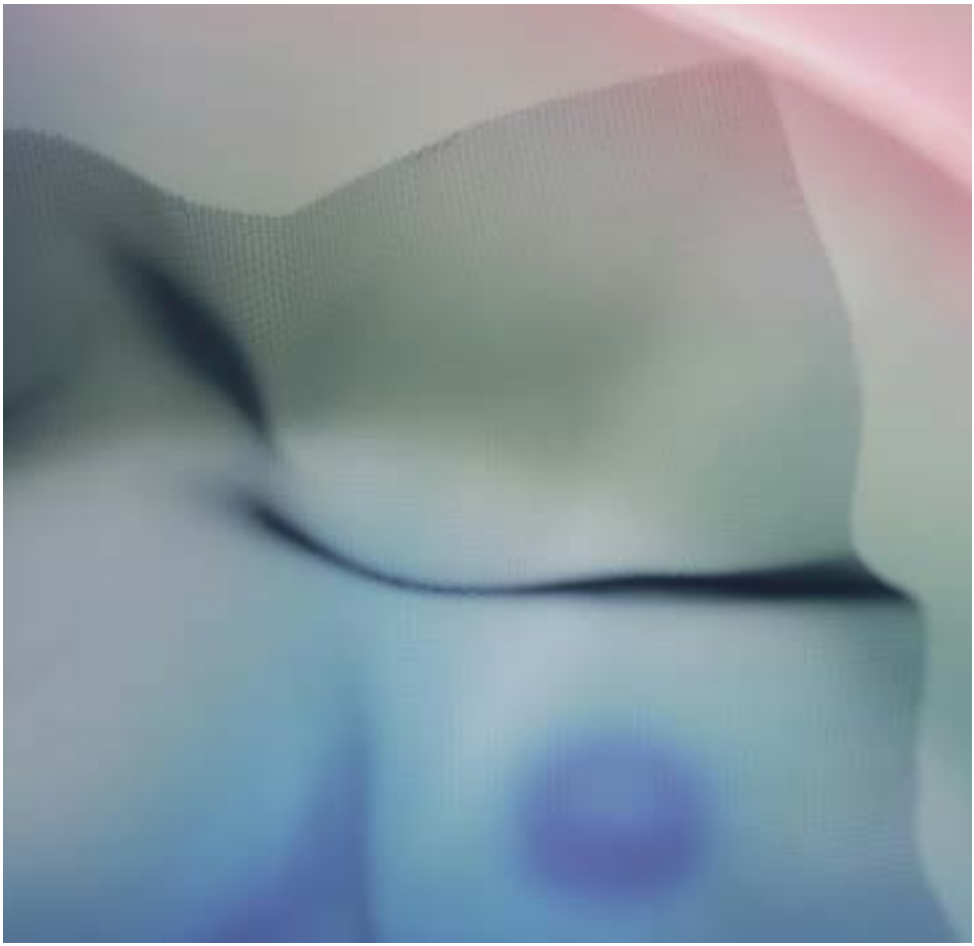


Photo: Fanette Guilloud

Munk has benefited from data from LCA (Life Cycle Assessment) software to compare figures for what is most sustainable.

TAKE THE MANDATE – IT MAKES A DIFFERENCE

Today, Matilda Blomgren Munk works as an industrial designer at the technology company Jabra, where her job is to design the shells of products. Even though she is just one part of a larger production, she can see that it makes a difference when she asks questions about the processes.

"In large companies, it can sometimes feel like designers are just a small cog in a big machine, which makes it difficult to drive ambitions for more circular design alone. Still, I think it is important to continue to be a spokesperson for sustainability, and constantly ask the question: What will be the most sustainable?"

It is precisely this persistence that makes a difference in her work, she explains, because even though it can sometimes feel like a small effort in the grand scheme of things, it has concrete consequences for how projects develop.

"It ensures that the sustainability issue is not forgotten in discussions, and it often adds an important perspective when comparing two different solutions. "I also find that the earlier I bring it up in a process, the greater the influence it has on the end result."

But it's not enough to just ask questions – it matters who you ask them to, Matilda Blomgren Munk has learned:

"Another strategy I often use in my work is to build good relationships with all stakeholders. People are happy to help those who meet them with kindness and respect, and therefore it becomes much easier to get your way when you have them on your side. In addition, I often use visual communication to make it easy for stakeholders to understand how we can work more sustainably."

EU RULES CREATE CHANGE

If you ask Matilda Blomgren Munk what it takes for circular design to really take off, the answer is clear: "Companies need more economic incentives. Many designers are ready to take on the challenge – we just need the framework on our side."

And she is optimistic about the future:

"I believe and hope that we will see more new companies that have circular economy as a foundation, where we designers become a natural part of the process. With the green EU regulations that are on the way, I expect that sustainability will naturally become a larger and more important part of product development."

WRITTEN BY

Marianne Baggesen Hilger
& Rebecca Cywan
DDC - Danish Design Center



Photo: Marlen Stahlhuth

ONEPAGER

TOGETHER WE SHAPE THE FUTURE OF DANISH CIRCULAR INDUSTRIAL DESIGN

The Danish Alliance for Circular Industrial Design (DACI) was founded with the aim of developing and promoting Danish circular industrial design. The members of the alliance are gathered across sectors and organizations, representing a wide range of knowledge, experiences and competencies, and who jointly see the need to support the circular design agenda in Denmark.

The alliance aims to identify and launch initiatives that can help define, communicate and challenge the practice of Danish circular industrial design. What the members of the alliance have in common is that they all have an interest in promoting and supporting the circular agenda.

“I hope the alliance can be a place where we also dare to disagree. Otherwise it will just be hot air.”

- Andreas Clemmensen,
Danish Chamber of Commerce

Through seven selected agendas, the alliance focuses on what it takes to design with a sustainable and circular approach within industrial design. These agendas aim to frame the foundation for this field, including problem areas and highlighting potentials and solutions for future design practice. We believe that today we work too fragmentedly, and will need to come together around a common direction in order to move forward and thus create the long-term connections to be able to create progress.

With the alliance, we strengthen and elevate the design industry by meeting around a common direction for industrial design in Denmark.
The agendas should not be seen as being set up in a prioritized order. They are all relevant if we want to take the circular transformation of Danish industrial design seriously. This also means that the agendas will and must be considered to be cross-fertilized, and that they will inevitably overlap due to the complexity of the field.

Nothing can stand alone, but for the sake of understanding, we have chosen to identify these areas, as we believe that actions can better arise if we make these focus areas concrete and convert curiosities into actions and initiatives, which can of course look in many ways.



Photo: Zetong Li

THE SEVEN AGENDAS – THE FOUNDATION FOR DANISH CIRCULAR INDUSTRIAL DESIGN

The following seven agendas define and outline the direction for Danish circular industrial design.

1.
THE DESIGN PRACTICE OF THE FUTURE
How do we ensure that the design practice of the future has the right toolbox and approach to designing life-extending systems for products and services?

2.
AESTHETICS FOR LIFESPAN EXTENSION
How can we work to challenge current perceptions and approaches to what good aesthetics are - both from a design perspective, a business perspective as well as from a consumer perspective?

3.
THE DANISH DESIGN CULTURE
How do we strengthen Danish design culture as a foundation for future circular innovation?

4.
ETHICS, USER BEHAVIOR AND SOCIAL INCLUSION
How can we work to ensure that circularity does not become exclusively an elitist agenda for the few, but rather an inclusive movement that many can see themselves in?

5.
CIRCULAR DESIGN LOGIC
How can design processes, business models and consumption patterns work to incorporate circular strategies early on that can help ensure the extension of the lifespan of products and materials?

6.
MATERIALS AS CIRCULAR CO-CREATORS
How can we work to transform the relationship with materials from passive raw materials to active design partners, where material selection can become a creative and strategic discipline?

7.
SYSTEMIC TRANSFORMATION AND ECONOMIC REALISM
How can designers act as systemic catalysts that create economically viable circular solutions across value chains, regulation and market dynamics?

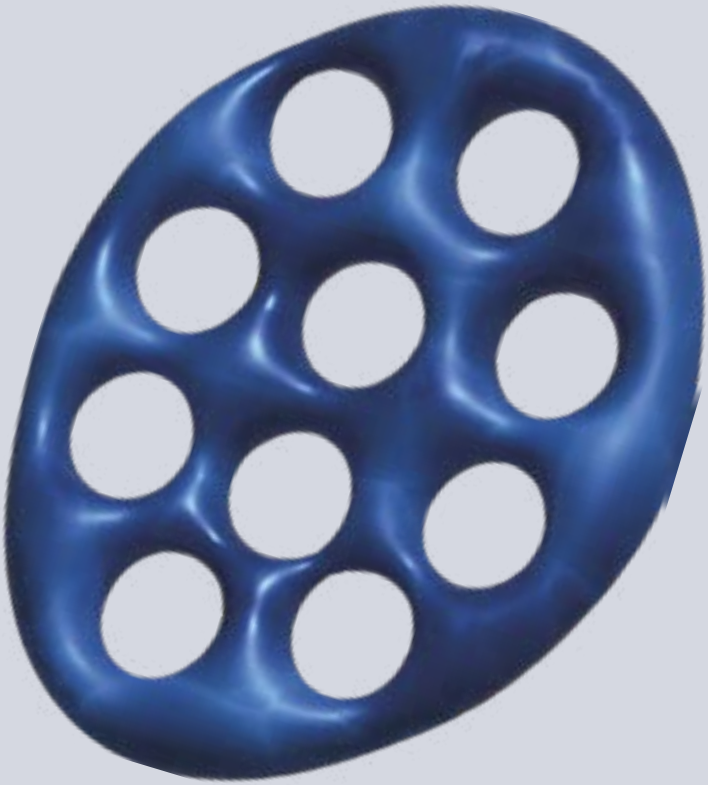


Photo: Fanette Guilloud

01

THE DESIGN PRACTICE OF THE FUTURE

How do we ensure that the design practice of the future has the right toolbox and approach to designing life-extending systems for products and services?



Designers have helped shape the world as it is today, and therefore the profession also bears a responsibility to rethink its own role in the circular transition. If design is to contribute to a sustainable future, it requires new and rediscovered competencies that extend far beyond design, including the ability to understand and design resilient systems, collaborate across disciplines, and design for continuity rather than immediacy.

"Young designers are often in closer touch with their own vulnerability – and it can actually be a gift if they learn to use it constructively."

– Christina Halskov, Halskov Design Studio

The designer can be considered a navigator and connector in the circular transformation. One who makes possibilities visible, connects actors and translates complexity into concrete actions, tests and tactile prototypes.

But it takes courage to experiment, to work with limitations as creative challenges and to rethink what quality and aesthetics mean in a world of scarce resources.

"The students are much better than they think. They bring new knowledge and energy – and we must give them the courage to hold on to it when they meet the industry."

– Peter Byrial Jensen,PhD, Product Lifecycle & Circular Business Models

The design skills of the future are not about making the same thing a little greener, but about designing for contexts rather than objects and for continuity rather than consumption.

WE ARE CURIOUS ABOUT

1. How can we develop design competencies that embrace the entire life cycle – from ideation, production and business model to product life and regeneration?

2. How can designers use complex challenges as creative drivers rather than limitations?

3. How can we redefine concepts such as aesthetics, quality and durability so that they support circular values rather than linear habits?

02

AESTHETICS FOR LIFESPAN EXTENSION

How can we work to challenge the current perceptions and approaches to what good aesthetics are - both from a design perspective, a business perspective as well as from a consumer perspective?



Design as a practice and field exists in a reality where speed, renewal and frequent replacement are often basic conditions. Aesthetics are often experienced as an individual experience through senses, emotions and what we find beautiful. But at the same time it is influenced by culture, social dynamics and trends that are constantly shaping, changing and varying over time. We therefore have to ask ourselves what aesthetics and quality really mean in an era where materials and products are expected to be flawless, uniform and preferably without any traces of use.

"We have a social construct of perfection. That's what we need to move on from – and because it's a social construct, we can change it."

– Linda Nhu Laursen, Research Leader, AAU

In step with industrialization and mass production of goods, a tendency has emerged in the Western world towards a narrow perspective and perception of what good and proper aesthetics are. Designers and companies have adopted an uncompromizing approach to design and thus contributed to being co-creators of a culturally based and uncompromising concept of aesthetics - a typical static perfection and condition that is associated with stability, immutability and maintaining constant novelty value, and may have contributed to accustoming (consumers) to have special expectations of aesthetics. In this unchanging perfection, there is typically not much room for materials and products to change over time - for example, to be allowed to age and acquire changes and help challenge what is commonly perceived as aesthetic perfection.

"We must learn to make compromises in design – including aesthetics – if we want a future on this planet."

– Ditte Marie Fog Ibsen, oasicare

Working actively to challenge the cultural anchoring of the concept of aesthetics is a prerequisite for being able to help expand our perception, and thereby also gain concrete inspiration and knowledge for more circular practices from other parts of the world. Designers and companies can help challenge users' perceptions of aesthetics and perfection by providing concrete images and making it concrete how materials and products can develop and change through different life stages and thus resist rapid trends.

"When working with natural materials, things can be imperfect. Patina is beautiful – it shows that something is alive."

– Tobias Øhrstrøm, Søuld

The aesthetics of the future should not only be about expanding the perfect but about learning to see the beauty in change – in the traces of use, in the journey of materials, and in the time that can establish itself as value and storytelling.

WE ARE CURIOUS ABOUT

1. How can designers and companies work more actively with variations, changes, organic elements in materials and see these as strengths rather than weaknesses?

2. How can circular strategies be actively used to challenge and explore consumers' perceptions and experiences of aesthetics and quality?

03

THE DANISH DESIGN CULTURE

How do we strengthen the Danish design culture as a foundation for the circular solutions of the future?



In Denmark, we have traditionally been good at having a close bond between design, production and craftsmanship. However, in line with, among other things, industrialization, globalization and outsourcing of skills, materials and craftsmanship, this bond has been loosened in many places, and more production has moved out of the country. This can mean the loss of valuable knowledge about materials, manufacturing and use. At the same time, there is a risk that the Danish design tradition will be reduced to aesthetics rather than a culture founded on responsibility, reason and quality.

"Good Danish industrial design has always been about uniting function, aesthetics and material quality – and about daring to think in new ways. It is the dream of doing something better that is in our DNA as designers."

– Christina Halskov, Halskov Design Studio

In times influenced by standardization, linear production chains, and consumption patterns, the field of design could benefit from rediscovering its human and artisanal roots, which are based on an understanding of the life, durability, and change of materials over time.

The Danish design heritage can contribute to a new circular practice. Denmark's design values, such as durability, functionality, simplicity, and thoughtfulness, are not nostalgic ideals, but can be seen as fundamental principles for responsible development.

"I don't see Danish design only as materials – it's a methodology and an understanding of how to approach a task. That approach can be applied directly in working with sustainability."

– Peter Byrial, PhD, Product Lifecycle & Circular Business Models

The Danish design culture is not a past that we must preserve, but can be a future tool that can be beneficially nurtured and activated further.
Our strength lies not in creating more, but in creating better product solutions and usage systems that are worth using, preserving and passing on.

WE ARE CURIOUS ABOUT

1. How can we re-establish a responsible interaction between design and production – what happens when we bring designers, craftspeople and industry closer together around local production, material understanding and long-term durability?

2. How can we rebuild and support respect for materials so that products are not just designed for use, but for example to age gracefully, be repaired, inherited and reused without losing their value?

3. How can we draw on Danish social movements such as the cooperative idea and the flat Danish collaborative culture and use principles such as trust, community and interdisciplinarity as a driving force for a new design practice?

4. What can we learn from the craft and design culture of the past, and how can we use this knowledge to shape the circular practice of the future?

04

ETHICS, USER BEHAVIOR & SOCIAL INCLUSION

How can we work to ensure that circularity does not become exclusively an elitist agenda for the few, but rather an inclusive movement that many can see themselves in?



The circular transition poses a dilemma: What if acting sustainably still requires time, money and resources that not everyone has? Repair, reuse and maintenance often depend on resources and motivation – and not everyone has equal access to them. At the same time, sustainability can quickly become a status symbol, where solutions for the community end up being too expensive, too complex or too far from everyday life.

In a reality characterized by increasing inequality, pressure on biodiversity and resource scarcity, we as a design field must revisit our ethical responsibility: Who are we really designing for, and who do we risk overlooking?

"For me, the social perspective is extremely important... We have to be very careful that sustainability doesn't become elitist."

– Marie-Louise Rosholm, studio MLR

Circular design can become a tool for participation rather than exclusion. The goal is not only to create products that are environmentally responsible, but also socially and economically accessible.

To succeed, we need to explore new ways to invite the user in as an active part of the cycle – for example, as a repairer, part user, reseller or even co-creator.

Ethics in design is about rethinking the way we consume and creating products that are based on consideration, durability and relationships rather than dependency.

Circularity is not just about materials and systems, but also about people, behavior and consumption. When we design with ethics as a compass and inclusion as a driving force, solutions can be created that enable more people to take part in a sustainable future – not only as users but potentially as co-creators of it.

WE ARE CURIOUS ABOUT

1. How can circular solutions be designed so that they are experienced as relevant and realistic regardless of background, finances or life situation?

2. How can design be used as a catalyst for community and participation rather than ownership and status?

3. How can we create products and services that invite responsibility without making the responsibility burdensome and paralyzing?

05

CIRCULAR DESIGN LOGIC

How can design processes, business models and consumption patterns work to incorporate circular strategies early on that can help ensure the extension of the lifespan of products and materials?



Far too many products are used for a shorter time than their value and potential dictate. At the same time, resource scarcity is pressuring us to extend the lifespan of the materials we have already extracted. Despite technical knowledge and craftsmanship skills, the current economy often stands in the way of implementing circular practices that reward upselling rather than maintenance. The vast majority of business models, legislation and consumer culture still rest on a linear "take–make–waste" logic, where repair, service and recycling are often secondary rather than central.

But the potential is enormous. Extending lifespans can create new business opportunities, strengthen the relationship between companies and customers, and activate local production and craftsmanship skills. For consumers, this can mean financial gain, greater ownership and a deeper connection to products that are allowed to live longer, which helps create incentives for, among other things, new innovative service solutions at companies.

"We don't just design with something – we design for something. We design for service, for upgrading, for repair, for second life – and lastly for recycling."

– Mads Kogsgaard Hansen, B&O

Circular design logic is therefore not only about extending lifespan but about rethinking the entire value chain – from how we design and produce, to how we consume and value over time.

When circular strategies become a natural part of the design process, we can truly change how we create value – not just for the market, but for people and materials over time.

WE ARE CURIOUS ABOUT

1. How can companies begin to integrate circular strategies into their business models – and what can be learned from starting small?

2. How can we ensure that the circular economy is about real value creation rather than just recycling materials?

3. How can modularity, repairability and long-term durability become drivers of innovation rather than barriers? And what happens when circular principles become the basis of the design logic, where lifespan and service are considered from the start?

06

MATERIALS AS CIRCULAR CO-CREATORS

How can we work to transform the relationship with materials from passive raw materials to active design partners, where material selection can become a creative and strategic discipline?



Every day we surround ourselves with materials, and we depend on them to make our daily lives work. Everything starts with materials, and they can become part of complex product systems or, in the worst case, end up as waste in e.g. an incinerator. But in step with digitalization and industrialization, there is an increasing tendency for many to lose respect, understanding and empathy for materials and their capabilities. Materials can be perceived as passive raw materials, where primarily static perfection is valued, while change is often seen as "mistakes" instead of patina.

"If you choose the wrong material from the start, you have already lost."

– Tobias Øhrstrøm, Søuld

Often, not enough focus is placed on the product life that the properties and potential of materials suggest. Millennia-old materials are used for disposable products and materials with long-life potential are discarded without thought – often because it may be more convenient or cheaper. There is great potential in asking more questions about the capabilities and value of materials and working more strategically and long-term with the use phase(s) of products in order to make the right material choices and create the right supporting activities for the products during their lifetime. Companies and designers can work on how they can consider and take into account the origin, relevance, function and future life of materials, and ensure that this can be defended from both a resource-related and ethical perspective. This requires a fundamental understanding of the characteristics of materials, their time horizons as well as their (local) potentials.

"Denmark could be the design nation that connected the waste streams. It's really complex - but we have the trust and courage to test things."

– Rikke Ullersted,
Designer & impact entrepreneur

In order to succeed with the circular transition, designers, companies and consumers will need to strengthen the Danish collective understanding of materials and their embedded value in order to best ensure long-lasting solutions and systems.

WE ARE CURIOUS ABOUT

1. How can we work experimentally and design-driven to transform the relationship with materials from passive raw materials to active design partners, where material selection becomes part of the creative and strategic development and production discipline?

2. How can we learn to see materials more as resources that can have value in all phases of their lives, where designers must learn to master the art of working with the natural strengths of materials as creative potentials rather than limitations?

3. What happens when circular principles become the basis of the design logic – where lifespan and service are considered from the start?

07

SYSTEMIC TRANSFORMATION & ECONOMIC REALISM

How can designers act as systemic catalysts that create economically viable circular solutions across value chains, regulation and market dynamics?



The circular transition requires more than good intentions. It requires rethinking the entire system around design, production and consumption. Today, it can be difficult to run a circular business in an economy that still rewards and demands linearity. Designers, companies and decision-makers are at a crossroads where action is often delayed by complexity, and where it can be difficult to know how to take the next step.

"Circular economy has become a buzzword. But for me, it's about responsibility – knowing what your choices mean."

– Lykke Margot Ricard, SDU

This landscape is complex because the activation of circular strategies often requires systemic changes across business models, legislation and user choices and behaviour. Without this holistic approach, the circular economy tends to remain an ideal rather than a practice. The question is therefore not just how we design better products, but how we create the frameworks and systems where value creation is measured by long-term durability rather than short-term consumption.

"It is expensive to adapt - but it is even more expensive not to do so."

– Andreas Hastrup Clemmensen, Danish Chamber of Commerce

The design field has a special ability to connect actors and interdisciplinarity, create overview in complexity, and translate visions into action and visual solutions. Design can therefore be a catalyst for the economic and structural change needed to make circular solutions viable.

"Long service life requires, among other things, that repair is considered in the design phase and that manufacturers provide spare parts and training in repair."

– Birthe Tofting, VOLA

Systemic transformation is not just about designing products for closed loops, but about designing new conditions for change. To be successful in this, it requires, among other things, the courage to work in the midst of complexity, the courage to experiment and the consideration of economic realism, collaboration and rethinking of value creation as part of the design task.

WE ARE CURIOUS ABOUT

1. How can designers contribute as systemic change agents, creating economically realistic solutions through insight into value chains, material flows and collaborations across disciplines and sectors?

2. How can we make circular economy a competitive advantage rather than a limitation, where regulation, transparency and take-back become natural parts of the design process?

3. How can we break the trend of silent waiting between consumers, companies and politicians and create a common space for experimentation and action?

4. What happens when circular principles become the basis of the design logic – where lifespan and service are considered from the beginning?

OUTRO

How do we move forward as a nation from here? And how do we strengthen circular industrial design in Denmark in a way that both honors our design heritage and meets future demands?

This publication has not provided the final answers, but has worked to open up some of the questions, perspectives and opportunities that can help us orient ourselves in a time when change is both necessary and inevitable.

The purpose of the publication has been to create a common starting point: a nuanced picture of both the issues and the scope of opportunities that characterize the circular transition. We have wanted to show the complexity without making it unmanageable. We have wanted to open our eyes to the strategic, cultural and practical approaches that can bring us closer to a more responsible and future-proof design landscape.

The work does not stop here. The publication is just a way to ask the curious questions – not an ending full of answers. The Danish Alliance for Circular Industrial Design (DACI) continues, and the coming years will offer new initiatives, working communities and experiments, where both companies, education, designers and other actors can step more actively into the change.

We hope that the publication has inspired commitment and curiosity, and that even more people will sign on to the work to develop, test and realise concrete circular solutions. We are open to new partnerships, ideas and alliances – large and small – because we know that change is created together.

Finally, we would like to extend a big thank you to everyone who has contributed to this publication: the designers, researchers, companies and members of the alliance who have shared their experiences, perspectives and courage.
Your voices have been crucial in creating the foundation on which we now stand together.

Dear reader, thank you for reading along, and thank you for helping to shape the future that we are all moving into.

Best regards,
DDC – Danish Design Center

On behalf of the partner group behind the Crafting Circularity project:
Aalborg University, Design School Kolding & The Royal Danish Academy.

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