Towards Tangibility

Organizations and Designers on the Brink of Sustainability Transition

SUMMARY

Contents

1 Forewords

We live in a time where the planetary crisis forces us to re-evaluate our ways of consuming, producing and living. The huge resource needs and overconsumption give a clear picture of how deeply rooted our operating model, guided by a linear economy, is.

Sustainability is extremely important in the field of design. Responsible design is needed in every sector and in many different stages of the value chain — for how products, spaces and services are designed and used to shape processes and strategies. Design plays an essential role in the systemic promotion of sustainability solutions, because it shapes the ways in which people use resources, live and consume.

The Ornamo sustainablity study focused on aspects of current legislation that affect the sustainable design of the built environment, materials, various consumer goods, digital products and services. The organizations involved in this study are striving for change. We wanted to find out what the transition means in practice at the moment and how it affects design.

This summary outlines the brief backgound of transition and key findings of the Ornamo sustainability study.

2 Sustainability transition: the general picture and current situation

CHALLENGES POSED BY THE SUSTAINABILITY TRANSITION

- The linear economic model increases the use of virgin raw materials and the amount of waste and the value of material is lost.

- Responsible design promotes an ecologically and socially sustainable future and financial benefits for companies when it is integrated into strategy and planning, but its full utilization requires the adoption of a circular economy and systems thinking.

- In rich countries, consumption related emissions are high. A large part of them are generated outside the countries' own borders, causing social inequality and uneven wealth distribution.

- Decoupling economic growth and consumption is necessary in order to reach the ecological sustainability– requires huge structural changes to global production– and consumingsystem.

- In Finland the main sustainablity challenges are the reduction of net carbon sinks and the weak state of nature. Finland also consumes the most materials and energy per capita in EU.

Key support mechanisms for the sustainability transition

The European Commission has adopted a set of proposals for reducing net greenhouse gas emissions by at least 55% by 2030, compared to 1990 levels. Green deal includes proposals related to energy, climate and biodiversity
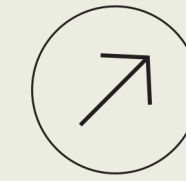
EU STRATEGIES AND LEGISTLATIONS:
- Corporate Sustainability Reporting Directive (CSRD)
- Corporate Responsibility Act
- Biodiversity Strategy
- EU Taxonomy (Sustainable Finance Framework)
- Digital Strategy
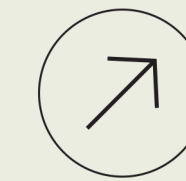
EU LAWS PROMOTING SUSTAINABILITY IN DESIGN AND PLANNING SECTORS:
- Eco-Design Regulation
- Digital Product Passport
- Textile Strategy
- Green claims directive
- Sustainable packaging
- Legislation for the Construction sector
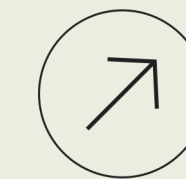
FINLAND'S SUSTAINABILITY GOALS AND PROGRAMS:
- Carbon-Neutral Finland 2035
- Strategic Circular Economy Program: Aims to reduce primary raw material consumption to 2015 levels by 2035, double resource productivity from 2015 levels, and double the circularity rate of materials.
- Biodiversity Strategy: Aims to halt biodiversity loss by 2030 and improve the state of nature by 2035

In planetary design, Earth's ecosystems are considered a key stakeholder in the design process. Responsibility also involves transitioning to regenerative thinking and design, which actively aim to improve and restore Earth's ecosystems. From this perspective, the well-being of nature and humanity takes precedence over the pursuit of substantial economic profits.

Jackson, C. What is planet-centric design? We Create Futures.
Mang, P. & Reed,B. 2020 (2nd ed.). Regenerative Development and Design.

The responsible designer:

- Identifies the environmental impacts of the design process by considering, among other things, materials, manufacturing processes, energy use, recyclability, and reusability throughout the entire lifecycle of the product or service.
- Values and respects cultural diversity.
- Takes into account and includes diverse users in the design process, allowing space for differences.
- Considers the safety of products and services, as well as factors such as the addictive potential of operational models, the right to privacy, and personal security during the design process.
- Enhances the value of new technology for users, customers, and society as a professional.

Ornamo 2023. Ethical Guidelines Presentation.

Photo: Joona Möttö

3 Results: Sustainability transition in organizations

The aim of the qualitative study was to gather information about organizations':

- RDI related to sustainability
- Challenges
- Skills and expertice requirements

Approximately half of the participants were designers and half worked in sustainability roles. Of the interviewees, two-thirds held leader or executive-level positions.
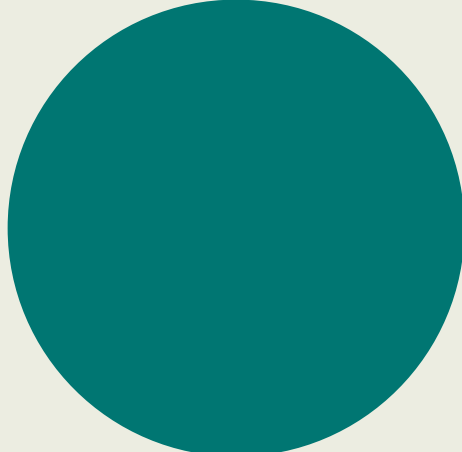
Participants

23
organizations

27
interviewees

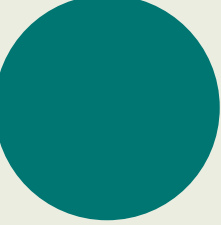
13
large companies

1
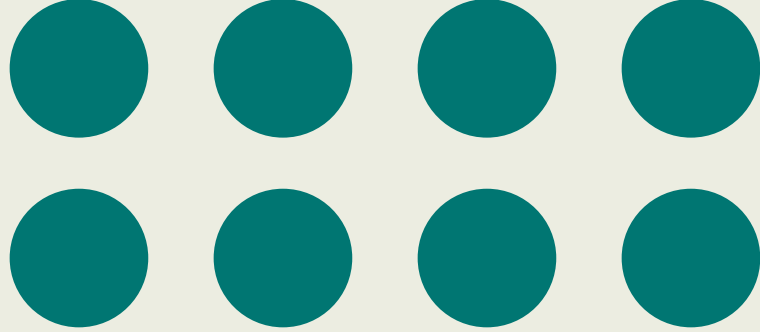medium-sized company
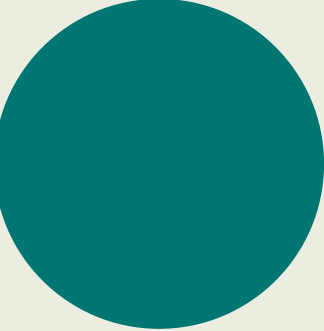
6
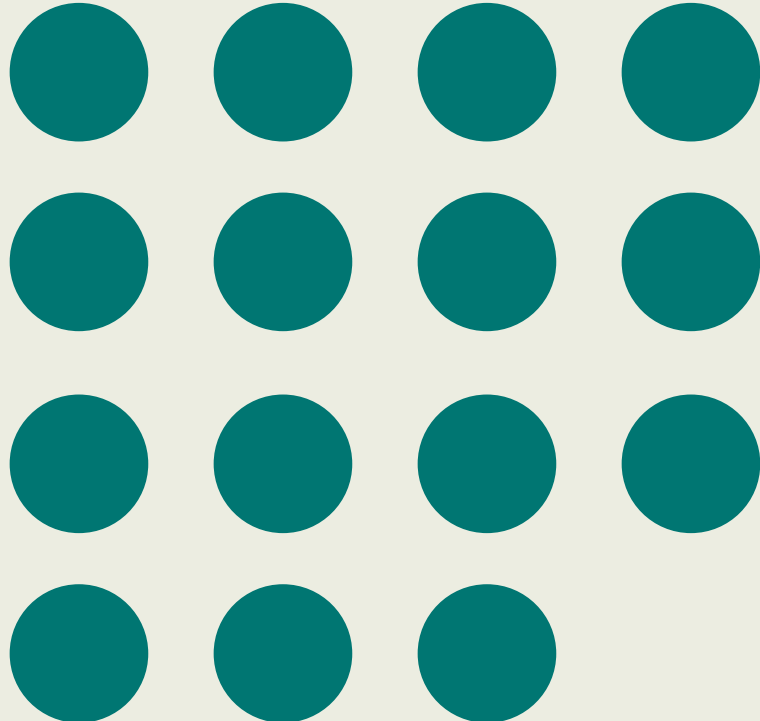small companies

3
microenterprise

BUILT ENVIRONMENT

- Construction
- Interior Design
- Chemical Industry, components
- Public Responsibility Services

CUSTOMER PRODUCTS AND SERVICES

- Design Intensive Industry
- UX/UI

BOTH SECTORS

- Chemical Industry
- ICT
- Trade Sector

The analysis highlighted three main categories: Drivers, Means, Innovation and Development Work, and Challenges. The themes with the highest frequency across these main categories were:

1. Data, measuring, and digitalization
2. Product and material development & sustainable design
3. Regulation
4. Knowledge and skills

These themes are discussed in the final section of this summary.

Sustainability expertise was divided as: General design skills in sustainability work and additional sustainability competences that support the knowledge of a specialist or team focused on responsibility efforts.

Required competences and skills are reported in the section 4.
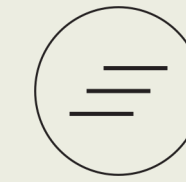
DRIVERS
- Legistlation
- Customers' and byers' requirements
- Investors' pressure
- Personal motive
- Competitiveness and attraction
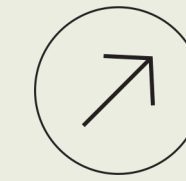
MEANS
- Strategy and business idea
- Collaboration and partnerships
- Data and measuring
- Sustainable design
- Sharing information and educating
- Tools and practices
- Influencing- and lobbyingwork
- Building responsibility culture

RESEARCH, DEVELOPMENT & INNOVATION

Now
- Products, materials and raw materias
- Services

In the future
- Dgitalization, data and AI
- Products, materials and raw materias
- Circular ecnomy solutions
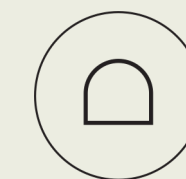
CHALLENGES
- Costs
- Legistlation
- Inaccurate operations or lack of interest
- Data and measuring
- Reuse and recycling
- Knowledge and skills
- Current linear economic model

MOST DISCUSSED THEMES: Data and measuring, product and material development & sustainable design, legistlation and knowledge & expertise

Drivers

- The impact of regulation has increased – it has accelerated operations towards the sustainability transition.

- Supply chains demand verifiably more responsible products and services in line with reporting requirements, influencing competitiveness.

- Sustainability solutions generate long-term savings.

- Responsibility attracts workforce to organizations.

- Reporting is reflected in the designer's work, for example, through information gathering, preparation for requirements, or providing sustainability expertise.

- Personal motivation plays a significant role.

Regulation is a key driver behind the fact that clients, customers, investors, and financiers are demanding more sustainable products and services from companies. The reporting obligations for large companies encourage responsible practices and require more sustainable products and services from partners and subcontractors.

Several respondents had committed to sustainability work early on for personal reasons, which was reflected in their professional choices.

The role of sustainability in business continues to grow, and organizations and individuals familiar with it hold a competitive advantage in competitiveness, employer branding, and the ability to meet future regulatory requirements.

"When our retail partners have to open and create reports in accordance with the directives, it inevitably leads to the need for us to have those answers. Right now, we are continuously developing the practices for how and who will be responsible for each area, and what kind of information we suspect we will be asked for, so that we can be prepared to respond.

"We constantly have people joining us—or at least applying—because of the perception that this is a place where they can focus on these issues and bring them into projects. There are also many clients here who value this work, allowing people to engage in work that aligns with their values.
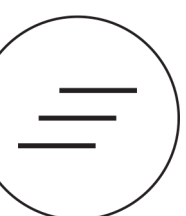
Means

- A responsible business strategy is seen as an important means of value creation for the company and solving global challenges.

- Broad collaboration is necessary to achieve impact. Organizations and designers engage in advocacy work in partnership with various stakeholders to encourage sustainable choices and influence decision-making.

- Sustainability actions within organizations currently follow eco-design regulations and user-centered design principles.

- Designers emphasize moderation. New solutions are only implemented when needed, and efforts are made to preserve what already exists. The principles of sustainable design also apply to digital services.

- When design is integrated into the project at an early stage as part of strategy and research, it enables the achievement of long-term sustainability benefits.

- Change is driven by data and calculations based on scientific knowledge. Numerical data and specific tools guide design and ensure the implementation of responsibility.

- Sustainability goals are put into practice within organizations by informing and training staff as well as companies in the supply chain. A culture of responsibility takes root when staff understand the importance of responsibility in their own roles.

Collaboration enables, for example, cleaner energy, the use of by-products, innovation work, or material development experiments. Additionally, broad industry-wide collaboration is needed to achieve impact and cost-effectiveness in sustainability actions

Several designers emphasized moderation, meaning that, the goal is to preserve existing, or if something new is created, it should be done user-centered and with durability in mind.

" Many things are not possible for just one company to do alone or with a partner. Especially when making larger changes, it requires a bigger lever to make the operations cost-effective and, in turn, meaningful from a responsibility perspective.

" The best product is one that you never really want to throw away or give up on, but rather something you want to use for as long as possible. And when that's the case, you're willing to repair and update it, and so on. Designing such a product with a user-centered approach from the very beginning is, in my opinion, key to the entire sustainability concept

" The basic rule of thumb is to not do things unnecessarily that consume resources, but to create things based on need.

Design can reach various target groups. Nudging and climate experiments are examples of how design is used in the context of sustainability, for instance, to guide consumers and city residents toward more sustainable choices

" We do a lot of climate experiments and climate nudges, which are aimed at city residents, regular people. In this case, our customer is always the city. So, the focus is on the consumer, but we also, for example, organize climate workshops for decision-makers, where we play a role in engaging them, helping them develop solutions that ultimately lead to the renewal of strategies.
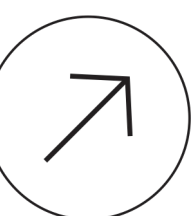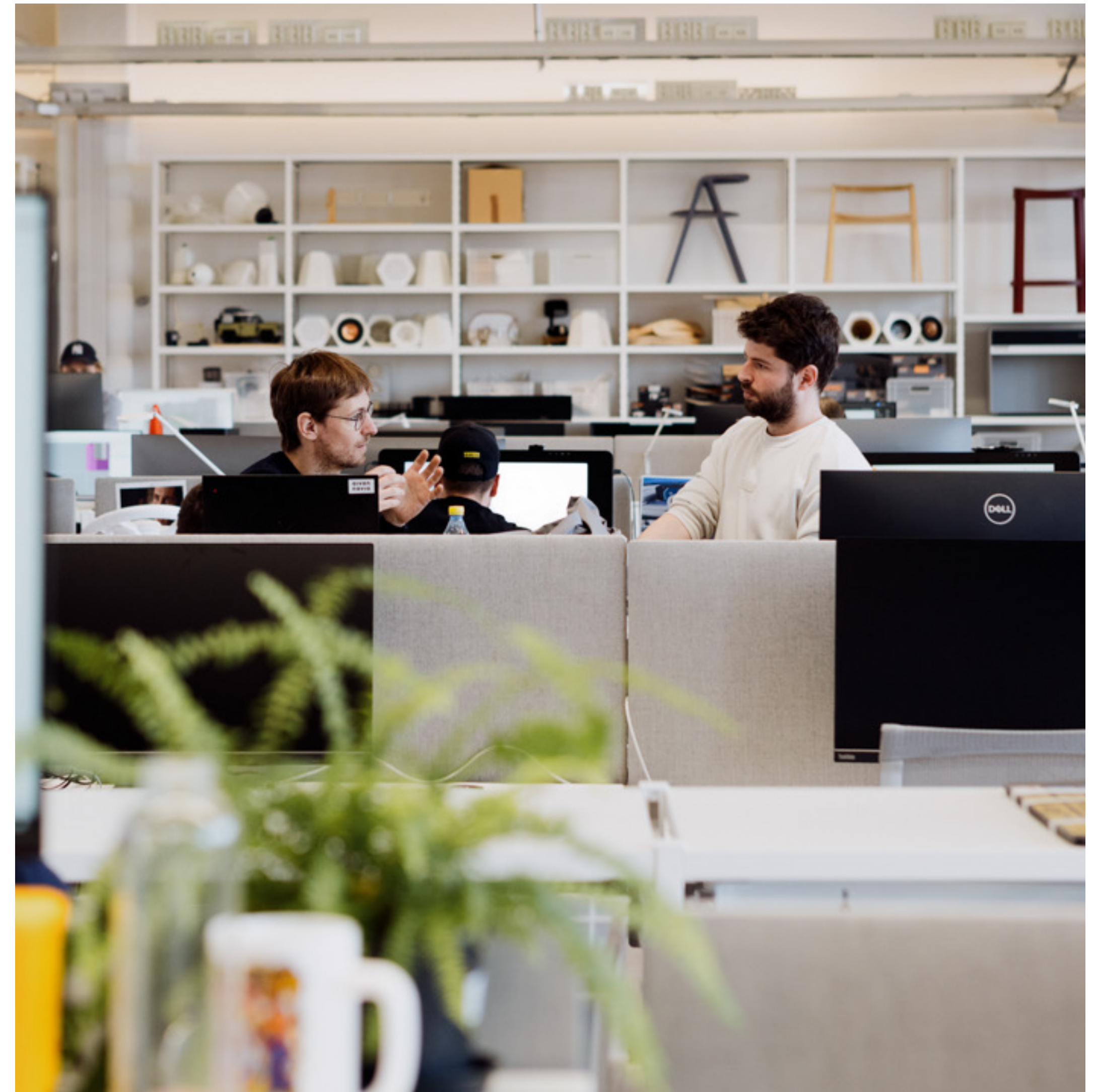
Change is driven by knowledge and scientific foundations. Data, as well as carbon footprint and handprint calculations, are utilized to develop and increase the transparency of operations. Calculators guide design, enable the comparison of alternatives, and help direct actions toward areas with the greatest potential for impact

The strategy's goals are implemented through employee training and communication to ensure everyone understands sustainability and how it applies to their role, embedding a culture of responsibility into the organization. Efforts are made to disseminate information and engage in advocacy targeting customers, consumers, and subcontractors.

" It's difficult to make improvements without measured data and knowing where the biggest areas for improvement are.

" We also educate our suppliers because it is indeed a challenge for smaller companies to keep up with what they need to do. A lot of effort is put into that, but also into how they develop their own responsibility. We can support them to a certain extent, but ultimately, they must take the actions themselves.

Innovation and development work now and in the future

- Development efforts have been prioritized in anticipation of sustainability regulations. Challenges have arisen due to changes in the operating environment, and not all development work has yielded the desired results.

- Innovation and development has been carried out across all phases of a product's lifecycle, from raw materials to recycling, reuse, and services.

- Many companies have developed solutions such as low-carbon materials, industrial symbiosis, and methods to utilize side streams in new products or improve the efficiency of construction sites.

- Artificial intelligence and innovations in digitalization are accelerating the sustainability transition. Opportunities are particularly seen in simplifying sustainability calculations and reporting, analyzing and optimizing materials, and advancements in robotics.

- However, addressing the challenges posed by AI and digitalization, such as increased energy and natural resource consumption, will also require innovations.

Innovation and development work was carried out for nearly all stages of a product's lifecycle:

- Research for low-carbon resources
- New materials development, also regenerative
- Environmentally friendly coatings and adhesives
- Industrial symbiosis –utilization of side streams
- Closed loop production
- Packaging and logistics
- Quality and classic style in design for product longevity
- Reuse, recycling and fixing services
- Product-service models

" Currently, there are innovations where, for example, dual fasteners are used. In the first lifecycle phase, the element is attached using one set of fasteners. Then, when those are removed, the second set remains intact on the product. I think this is a great example of the power of design. It involves only a marginal additional cost during the manufacturing phase of the element, but it enables a second life cycle later on.

Digitalization and artificial intelligence were seen in many organizations as a transformative development path for the future, impacting all industries. Innovations are expected significantly accelerate the sustainability transition and solve global problems. However, several interviewees also expect urgent assistance with their practical work, such as easing sustainability calculations and reporting.

Digitalization is a key opportunity for the sustainability transition, but ICT sector experts stress the need for sustainability. The linear economy model in the digital world leads to cheap production, user dependencies, and overconsumption, resulting in digital "landfills," energy waste, and user distress

" Well, AI will probably sweep over us as well, and it will likely change operations in ways we can't even predict. I could imagine this being quite a central issue that will also define what we do, and of course, it involves data quality management and accuracy in the big picture.

" These landfills need to be fixed. The data is so cheap. The landfill is somewhere in a data center in Indonesia or anywhere else, so it's not visible, it doesn't feel, and it costs nothing, so no one realized it even exists. But there are a lot of digital landfills. They need to be fixed, and innovations could be found to address this. First, minimizing this harm would be the primary innovation focus.

Challenges of the sustainability transition

- The design industry has the capability to create more sustainable solutions, but these are not always incorporated into projects.

- Tighter regulations have increased costs for businesses, taken time, and required rapid system updates.

- Obtaining reliable and transparent data from supply chains, especially global and complex ones, is challenging.

- The competitive landscape, inadequate standards, and differing measurement techniques and protocols hinder data sharing and project comparability.

- Organizations face a significant challenge in processing and adopting the vast amounts of data that are continuously generated.

- There are not enough experts to meet national needs.

- A lack of a comprehensive understanding challenges sustainability efforts.

- Clients of the interviewed organizations take individual actions or try to meet requirements with minimal effort.

- Full implementation of reuse and recycling would require a reorganization of the entire value chain. The economic viability of sustainable solutions remains a challenge for many companies.

- The initial investment in sustainably produced goods is higher, and long-term savings may not be immediately apparent. Convenience and market pressure prevent sustainable choices from being made.

Costs are the biggest challenge in B2B trade, even though it is often understood that responsibility comes at a higher price. Sustainably produced products and services, such as low-carbon concrete, energy solutions, or timber construction, require a significant initial investment. However, investments in sustainability lead to savings in the long run.

Designers have the capability to create sustainable products, such as repairable and upgradable solutions, but decisions are often driven by the client's financial priorities.

Regulations such as CSRD reporting, corporate responsibility laws, the taxonomy, and the deforestation regulation have posed challenges for companies, particularly in terms of data collection, system upgrades, and ensuring the sustainability of the supply chain.

> Designers are already equipped to create products that can be repaired and upgraded. The question is simply whether the client wants such solutions. We can always propose them, and then the client decides to approve or reject them—often based on cost. But the capabilities are there.

> We are still in the early stages when it comes to obtaining this data from manufacturers. Personally, I hope that legislation would require material manufacturers to provide this data, because many of these choices are still largely based on assumptions and general understanding.

> My personal view is that too much emphasis today is placed solely on pragmatic matters, like increasing the amount of recycled plastic in the materials we use. That's great, but if those products are still being pushed forward in a single-use concept, it really doesn't make any difference.

The interviewees highlighted challenges related to clients' and buyers' short-sighted decisions, ineffective sustainability measures, and lack of interest in promoting sustainability. While there is a lot of talk about responsibility, concrete actions remain scarce.

Products' take-back, reuse, and recycling face numerous challenges across different industries. Globally, significant issues include varying regulations, the lack of collection systems, and difficulty finding partners. Additionally, take-back processes are often expensive and labor-intensive.

Designers are calling for a comprehensive shift, with a focus on slower consumption and the production of higher-quality products. Stricter regulations are particularly desired to mitigate the harms of fast fashion and low-cost production.

The amount of information is constantly growing, and its adoption within organizations is challenging. Key issues include the busy daily workload, a lack of suitable and concise information sources, and the costs of supplementary training, which not all organizations are willing to invest in.

There are differences in expertise between industries and countries. The terms circular economy and sustainability are often misunderstood, which makes it difficult to achieve a shared understanding.

"

The terms are still confusing for many. For example, I often come across the misconception that circular economy is the same as recycling, as if they were synonyms. The terms and their meanings get mixed up.

CHALLENGES OF THE SUSTAINABLE TRANSITION

4 Competence and skill requirements

Competence and skill requirements were divided into two areas in the results:

GENERAL SKILL NEEDS OF DESIGNERS

Design thinking (i.a. idea generation, problem-solving, research, visualization, iterative processes, concept development), customer and user centered, attitude, values and motivation, participation and facilitation, collaboration, as well as systems and future thinking.

REQUIRED SKILLS FOR SPECIALISTS FOCUSED ON SUSTAINABILITY

Understanding of sustainable life cycles and value chains, sustainable materials and manufacturing, understanding of systems and complexity, business expertise, basic knowledge of circular economy and sustainable development, interdisciplinary collaboration, utilizing data and assessments, branding and communication, argumentation and negotiation skills, and regulatory knowledge.
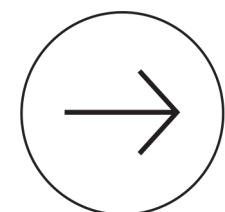
→ The required design and sustainability skills also depend on the designer's job tasks and role. The following pages summarize the skills in more detail.

General design skills in sustainability work

DESIGN THINKING	Designers' fundamental skills, processes, and methods support the systematic development of solutions for the sustainability transition. This means the ability to solve open, complex problems creatively. Designers also use iterative and experimental methods to define the problem and solution simultaneously, narrow down options, and, on the other hand, generate alternatives.
SYSTEMS AND FUTURE THINKING	Designers also have a future-oriented mindset, and systems thinking helps them see the connections and dependencies between different parts of a problem. This way, solutions consider the whole picture, not just individual parts of the problem.
CUSTOM- AND USER- CENTERED	This includes understanding and researching the context of the product or service being designed. At best, it provides a foundation for a sustainable and long-lasting product or service. It helps in making informed decisions and evaluating what is essential, adding value to the organization and the team.
FACILITATION AND CO-CREATION	This skill is essential when solving complex problems and bringing together experts from different fields.
ATTITUDE, VALUES AND MOTIVATION	Attitude involves curiosity, a desire to learn and develop. The work should emphasize a change in mindset that leads to more sustainable and ethically sound solutions. Maintaining motivation is connected to the nature of the sustainability transition, where knowledge is continuously updated, and uncertainties are involved.
DESIGNING BEHAVIOR (DESIGNING SUSTAINABLE LIFESTYLE)	Designing products, services, evaluation tools, and environments that influence people's choices, habits, and behavior in the desired way. Deep user understanding also provides insight as a basis for circular economy business models

Required skills for specialists focused on sustainability

|	
UNDERSTANDING SUSTAINABLE LIFE CYCLE AND VALUE CHAIN	The ability to design the entire life cycle of products and services—from material choices and manufacturing methods to the reuse or recycling of the product, as well as assessing the responsibility of the value chain.
SUSTAINABILITY –ORIENTED MATERIAL AND MANUFACTURING KNOWLEDGE	Understanding materials and their use from the perspective of responsibility. A key expertise for product development teams is also an understanding of new, more environmentally friendly materials and how they can be used in line with circular economy principles.
UNDERSTANDING SYSTEMS AND COMPLEXITY	The ability to evaluate complex systems, which includes resolving conflicting values.
BASIC KNOWLEDGE OF CIRCULAR ECONOMY AND SUSTAINABLE DEVELOPMENT	Theoretical expertise in sustainability and related concepts, enabling effective action in complex transformation processes.
INTERDICIPLINARY COLLABORATION	Solving challenges related to the sustainability transition and life cycle in collaboration with other professionals.
UTILIZING DATA AND MEASUREMENTS	Comparing solution options, modeling, and managing life cycle assessment helps in making sustainable design decisions.
BRANDING, COMMUNICATION, AND BUSINESS KNOWLEDGE	Understanding the impact of a brand's physical presence and it's experiential dimension, and ability to express it through design. Understanding the development of commercial concepts and the role of data in business. Knowledge of allocation of costs and managing the constraints of industrial production.
ARGUMENTATION AND NEGOTIATION SKILLS	Convincing the team and clients of the importance of responsible choices and encouraging them to commit to responsible practices.
REGULATORY KNOWLEDGE	Sustainability legislation is increasingly important across all sectors. It is becoming even more crucial for design teams, as their choices impact the environmental effects, ethical practices, and sustainable development of products and services.

5 Towards sustainability transition

The results of the study reflect, as expected, a broader context that has also been highlighted in other reports and studies in recent years regarding the responsibility work of organizations and designers.

Designers have role in interdisciplinary teams and throughout all stages of the sustainable value chain. Designers are developing new materials and renewing production methods, designing products and services, shaping business models, strategies, marketing, graphic design, packaging design, and contributing to the development of reuse processes that bring raw materials back into primary production.

In addition, the sustainability transition is not occurring solely within a technological framework, but simultaneously, changes must take place in lifestyles and human behavior. User-centered design now focuses on influencing sustainable choices, thus also promoting fair business practices.

In this study, four themes are particularly important for organizations currently, requiring the most expertise within design and planning teams:

• Data, measurement, and digitalization

• Product and material development & sustainable design

• Regulation

• Knowledge and skills
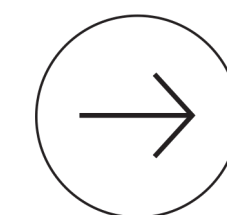
→   In the following these themes are summarized.

Data, Measurement, and Digitalization

- Managing data and life cycle assessment supports decision-making in evaluating the sustainability of products and services.

- Digitalization and AI applications help with optimization and managing complex processes.

- Sustainability issues related to digitalization require new innovations.

It is beneficial for designers to familiarize themselves with life cycle calculations and data analysis so that they can utilize information about the sustainability of products and services in their design work. The designer supports decision-making by presenting cause-and-effect relationships, prioritization, and foresight.

Digitalization and AI applications are expected to be innovations that significantly accelerate the sustainability transition, as well as assist with optimization and managing complex processes. Organizations should develop practices where AI and digitalization applications support the sustainability transition. Designers are part of design teams developing these applications. AI-related skill needs for designers can vary depending on their position and may include, for example, tools and automation such as generative design, AI interactivity, machine learning, as well as AI analytics and predictive models.

Product and Material Development & Sustainable Design

- Design teams play a key role in developing sustainable and resource-efficient products and services, as well as promoting a more sustainable lifestyle.

- Design brings iterative methods to the development work, such as prototyping, experimentation, and continuous improvement.

- The experimental focus of design supports bold thinking and nonlinear solutions.

The unsustainable use of natural resources significantly impacts other critical areas of the planetary crisis. Wise use of resources and materials emphasized in regulations, national strategies, and circular economy initiatives, is essential for all design roles. Resource wisdom perspective should include moderate consumption, biodiversity support, and regenerative practices, aiming for planetary well-being beyond economic metrics. Solutions for adapting to sustainability challenges also require innovation and interdisciplinary collaboration across all fields and sectors of society.

Organizations are vital in transforming production and consumption systems. Integrating material life cycle optimization and regenerative design into strategies can foster innovation. It is essential to actively engage in collaboration and participate in working groups dedicated to advancing the field. Small steps by value chain actors can drive broader sustainable change. Design teams play a key role in advancing resource efficiency, circular economy adoption, and life cycle models. Designers understand user needs and experiences within the context of sustainability, which helps guide the development process of a service or product, as well as its end-result, toward practical benefits and usability.

Regulation

- Responsibility-related regulations will tighten in the future, as the sustainability transition has not progressed through voluntary actions.

- Legislative expertise, along with the management of related data and reporting, plays a key role in organizations.

- Pioneer companies understand the impacts and opportunities of regulation.

Legislative expertise, along with the management of related data and reporting, plays a crucial role in organizational operations. Even those who are not yet subject to reporting obligations should invest in understanding regulations and develop internal processes to ensure compliance. Communicating how an organization can meet supply chain requirements is also essential.
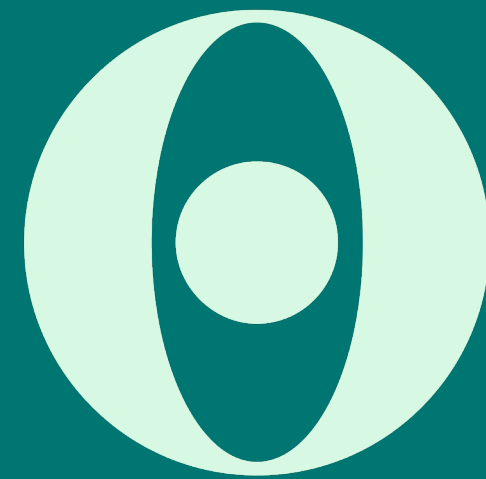
The basics of regulation should be made concrete for design teams so they can consider regulatory requirements from the very beginning of the design process. It is important for design teams to learn how to interpret key regulatory demands and incorporate them into their work.

Knowledge and Skills

- Knowledge and skills are the cornerstones of the sustainability transition.

- Design can be used to illustrate the future and sustainable everyday life.

- User-friendly design aids in visualizing information: it enhances the achievement of sustainability goals and supports decision-making.

- Design thinking serves as a tool for renewing existing structures and introduces new perspectives to interdisciplinary collaboration.

- The design process involves creating critical understanding, organizing information, and establishing important connections between seemingly unrelated elements.

Investing in sustainability knowledge management and integrating expertise across organizational levels fosters a culture of responsibility. This begins with identifying industry and supply chain knowledge needs and providing position-specific sustainability training.

Traditional methods and concepts demand a radical transformation. Design thinking is an effective tool for renewing existing structures and introduces fresh perspectives into interdisciplinary collaboration. The design process involves, during the research and data collection phase, creating critical understanding, organizing and concretizing information, and establishing vital connections between seemingly unrelated elements. Designers should invest in articulating and showcasing their expertise: in how they can bring value to the work required for the sustainability transition.

ORNAMO