

THE CIRCULARITY GAP REPORT

Danish Industry leaders provide recommendations for a circular manufacturing industry

A NATIONAL BENCHMARK FOR CIRCULAR ECONOMY IN DENMARK

In 2023 Denmark launched its first Circularity Gap Report and was, for the first time, able to set a national benchmark for circularity, revealing these three main findings:

Denmark is only four percent circular. Well below the global average. This means that the vast majority of material inputs to the Danish economy comes from virgin sources. It is striking that Denmark's material consumption is more than three times higher than the estimated 'sustainable' level.



MATERIAL FOOTPRINT

**24,5 tonnes
per person**

EU average is 17,1 tonnes per person



CARBON FOOTPRINT

**11 tonnes
per person**

EU average is 9,5 tonnes per person



CIRCULARITY METRIC

4%

Global average is 7,2%

CIRCULAR STRATEGIES CAN DRAMATICALLY REDUCE THE DANISH MATERIAL FOOTPRINT

Circular strategies can dramatically reduce the Danish material footprint. The report explores five 'what-if' scenarios with key levers to boost circularity. Together, they can transform the economy and increase the Circularity Metric from 4% to 7,6%. The material footprint could be reduced by 39%, while the carbon footprint could decrease by 42%. The five scenarios are: 1) Build a Circular Built Environment, 2) Embrace a Circular Lifestyle, 3) Rethink Transport & Mobility, 4) Nurture a Circular Food System, and 5) Advance Circular Manufacturing.

Advancing Circular Manufacturing

This report zooms in on the fifth scenario; the future of the manufacturing industry and provides concrete recommendations from industry leaders to boost the circular transition in the Danish manufacturing industry.

Across the different scenarios in the report, the manufacturing industry plays a dominant role in regards to how products are both sourced, designed, produced, and travel through the products' life-cycle (from repair, reuse to disassembly, remanufacturing, and recycling). This spans across sectors such as plastics, electronics, wind, food, textiles, and furnitures. Therefore, the manufacturing industry has been singled out for this report by the Danish Circularity Gap Alliance. Two other similar industry reports are produced by the Alliance: one focusing on the constructions sector, and one focusing on textiles and furnitures.

Behind the report:

The Circularity Gap Report is produced by the Dutch organization "Circle Economy" in close collaboration with an alliance of six Danish organizations: IDA - the Engineers Association, DI - Danish Industry, DTU - The Technical University of Denmark, DDC - The Danish Design Center, Danish Technological Institute, and Lifestyle and Design Cluster. The report is financed by The Danish Industry Fund.

Read the Circularity Gap Report

This is a very short recap of the Circularity Gap Report for Denmark. Read the full report to understand the methodology behind the report, to get a more granulated introduction to Denmark's material use, and to dive into the five circular scenarios: www.circularity-gap.world/denmark

ROUNDTABLE FOR A CIRCULAR MANUFACTURING INDUSTRY

Translating report findings to concrete industry actions

The Circularity Gap Report was produced with the goal to accelerate the shift to a circular economy in Denmark. So, it has been crucial for the alliance behind the report to actively inspire concrete and practical action and collaborations for a more circular economy in the Danish industry.

Therefore, the alliance behind the report conducted three sector-specific workshops, that invited frontrunners from the industry, to provide concrete and practice-based recommendations for a circular economy that mobilizes many more companies to explore new circular business models, and initiate circular partner-ships.

The three workshops have targeted the following three industries:

1) the construction sector, 2) textiles and furniture and 3) manufacturing.

Roundtable for circular manufacturing industry

20 Danish frontrunners, from Danish companies, joined a roundtable for a circular manufacturing industry, on February 28th in Odense, Denmark. The list of participants represented a diverse group of companies working across energy, wind, building materials, plastics, heating, and metal. All of them have in common that they are company leaders who have, for some years now, been committed to transitioning their companies in a circular direction. They carry knowledge, expertise, and hard earned experience that is tremendously valuable to new companies who are setting out on new journeys for a circular transition.

Learning from practice

The recommendations targeted at the manufacturing industry, in this report, is a concentrate of the exchanges from these 20 business leaders. It is important to emphasize that this report is not a representative, statistical compilation of sector recommendations. It is based on personal and practical experiences from an open and trustful dialogue with frontrunners in the field. It does not aim to be comprehensive, but instead to call for, and inspire companies to take action in the circular transition, by addressing industry barriers with concrete recommendations.

CASE

Aage Vestergaard Larsen

Aage Vestergaard Larsen's sustainable and circular product is 100% recycled plastic granules. The plastic granules serve as the industry's raw material for the production of plastic products. The granules are primarily supplied to the Danish and Swedish plastic industries, which then use the recycled plastic as an alternative to virgin plastic. Our focus has always been, and still is, to produce a 100% recycled plastic raw material (granules) for the European plastic industry, in a quality that can replace virgin/new plastic.

Recently, we have developed a technology that enables the recycling of household-sorted plastic waste into such high-quality that it is approved for cosmetics and hygiene purposes.



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“It is of course ‘a bit funny’ that we, as a company, have been sustainable, and circular since we started our journey, back in 1972 - those two words just weren’t there! When it comes to taking care of our world, and putting circularity first, it’s really quite simple - you can ALWAYS do better - you either develop your business, or you phase it out.”

Gitte Buk Larsen, Creative director at Aage Vestergaard Larsen A/S

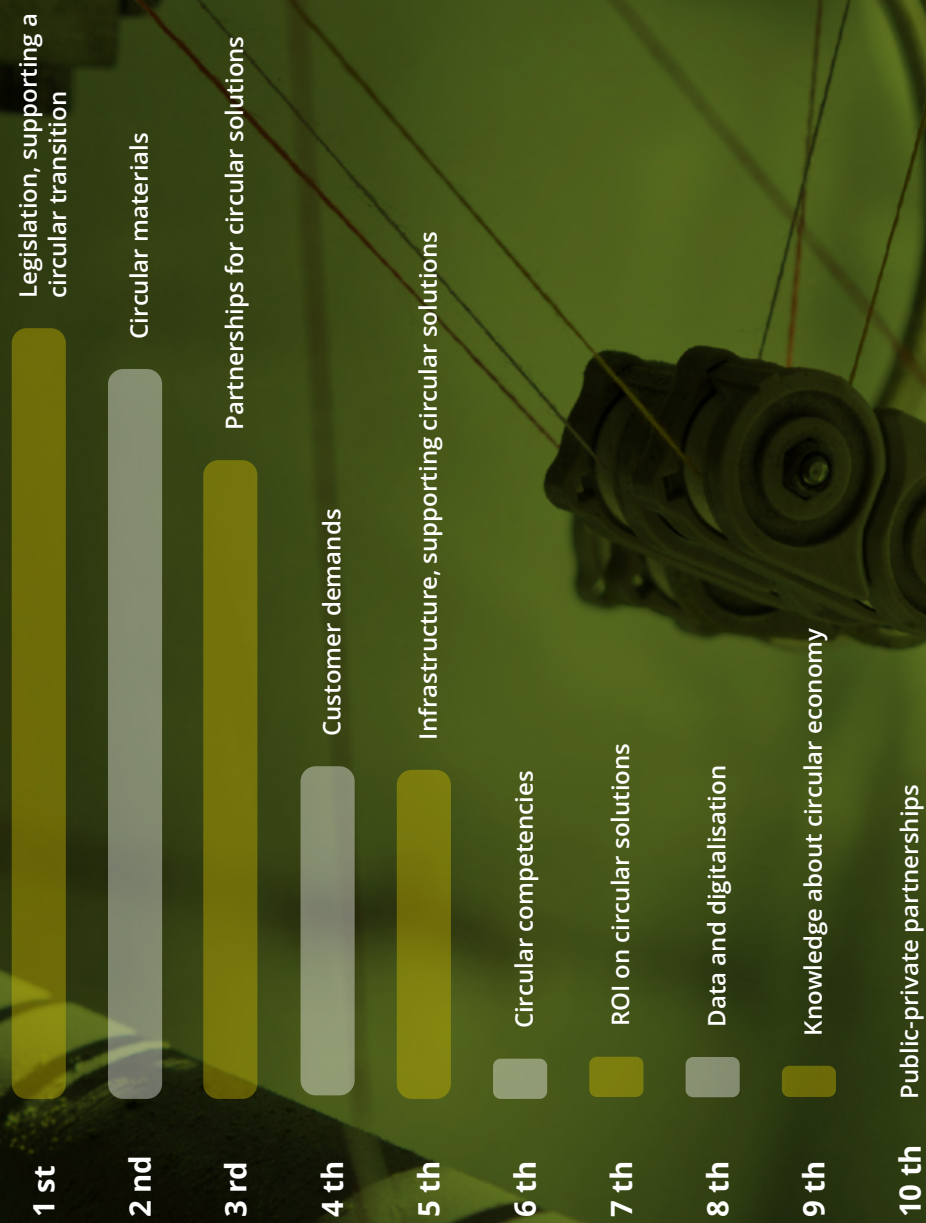
SCOPE OF THE RECOMMENDATIONS

As a point of departure, the roundtable participants identified some of the major barriers that challenge their ability to succeed with the circular economy. The barriers are depicted on page 7, and served as a backdrop for the recommendations, that were developed during the roundtable.

The focus for the roundtable was on the practical development and implementation of a circular economy in manufacturing companies. Therefore, the participants agreed to downplay the discussion on legislative and regulatory barriers and drivers for the circular industry, as these are often outside the individual company's mandate and space for action. While legislative framework conditions are instrumental for either enhancing, or hindering, the implementation of circular solutions, they were treated to a limited extent in the workshop, to allow room for practice-based recommendations targeted at business leaders.



What are the main barriers to the circular transition?



FIVE THEMES

The outcome of the roundtable resulted in recommendations around five different themes described below:

-  **Leadership & Strategy for circularity**
Company strategy and leadership commitment to the circular economy
-  **Circular Business models**
Identifying the right new business models for circular solutions
-  **Circular Materials**
Circular materials - how reused, recycled materials as well alternative new materials can be applied in the industry
-  **Partnerships and alliances for circularity**
Engagement in collaboration and alliances around circular solutions
-  **Circular Infrastructure**
Industry incentives for a circular infrastructure



CASE

Blunico

As part of Blunico's journey towards a green transition, we have initiated a process with a supplier focusing on how we can become more sustainable. The initiatives revolve around transportation and packaging. By addressing these points, we aim to streamline our operations, reduce waste, and minimize our environmental impact, as part of our commitment to sustainability.

Currently, we receive steel deliveries approximately four times a week. We have asked ourselves, can this frequency be reduced to two fixed delivery days per week? This reduction would lead to savings in transportation costs and CO2 emissions.

The steel plates are delivered on single-use pallets, that are not reused. Is it possible to reuse or recycle these pallets? Recycling the pallets would conserve resources, that otherwise used in manufacturing new ones.

We use covering paper and plastic for packaging. Can these materials be recycled?



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“Blunico is committed to contributing to the green transition, but we recognize that true progress can only be achieved in collaboration with our customers and suppliers. Together, we become stronger advocates for sustainability – because ‘together, we are better’.”

Bo R. Ulsøe, Director at Blunico

Recommendations

Recommendations from the roundtable, on each business model:



Leadership & Strategy for Circularity

- Get started now - the sooner you act, the bigger a competitive edge you will have tomorrow.
- C-level dedication and buy-in is mandatory. Define a company strategy that takes full responsibility for your products - upstream and downstream in the value chain.
- Set concrete and ambitious goals that broadly motivates and engages employees across the organization to contribute.
- The hunt for perfection often destroys good solutions. The circular transition takes time, and you must learn to communicate that you are progressing and have not reached the goal yet.
- Engage with your value chain, partners, and collaborators to reach your circular goals - you cannot become a circular company in isolation.



Circular Business Models

- Sustainability and circularity should be part of your business strategy. It can be an important driver of innovation.
- Make circularity your competitive edge - put a price tag on it, and sell it to your customers.
- Focus on products that bring added value to the industry and society - do your services and products answer a demand, or merely produce new demands?
- Make use of the design phase, and try to design out waste in the first place. Design for durability, reuse, and repair, and refit your business models to support this.
- Follow industry standards when you design and manufacture to avoid waste.
- Give customers information on how to maintain, care for, and repair your product.



Circular Materials

- Understand the quality of your products and materials and how they differ from new goods.
- Design your materials to be effective for the specific purpose they serve. Whether a material should be durable, or dissolvable depends on their specific use.
- Processes to approve new materials are too comprehensive and slow. The industry needs to be brave in integrating new materials to their product lines.
- Consider waste as a resource, and explore the balance between which requirements and possibilities that are necessary in order to transform waste into products. Make sure you do not produce more waste in the process.
- Always avoid over-packaging. Use less packaging for your products, by handling them more carefully through closer collaborations with your suppliers

Recommendations



Partnerships and Alliances for Circularity

- Understand all phases of the product's life-cycle to identify where to improve and create changes.
- Circular partnerships should be based on finding solutions and solving problems together. Find like-minded companies and organizations that have similar interests to yours. Together, you can drive change in the value chain.
- Prioritize partnerships with customers, authorities, researchers, and suppliers. Understand that working in partnerships requires new skills in your organization (e.g. stakeholder management, communication, and industrial psychology).
- Implementing circular value chains often implies changing business as usual. Analyze how you, as a business, can affect and drive new actions among your collaborators and competitors by, for instance, introducing new requirements to your subcontractors.
- Initiate collaborations across sectors, but also outside the borders of Denmark. Circular solutions must reach scale in order to become competitive.



Circular Infrastructure

- The industry should work collaboratively for a stronger, open-source data infrastructure that supports requirements for reporting.
- Legislation should favor reverse logistics and products that are durable. In other words - sustainable products should be the norm.
- To create scale in circular solutions we need more demand for these solutions - from both private and public procurers..
- Repairing products is often more demanding and complex than designing new products. Therefore, repair skills should be trained both in companies and educational institutions.
- Make use of your local trade, or business organization! There are people in your industry there to help you navigate the complexity of the circular economy, and to help facilitate partnerships and collaboration.

EXAMPLES OF CURRENT DANISH CIRCULAR INITIATIVES:

Reshape Waste helps Danish companies utilize the economic and environmental potentials in waste and residual materials. Created by The University of Aalborg, The Danish Industry Fund, Technological Institute, Confederation of Danish Industry

Closing Loops. An EU and Danish Business Promotion Board funded project focusing on implementing circular value chains in small and medium-sized enterprises across sectors, including the construction industry

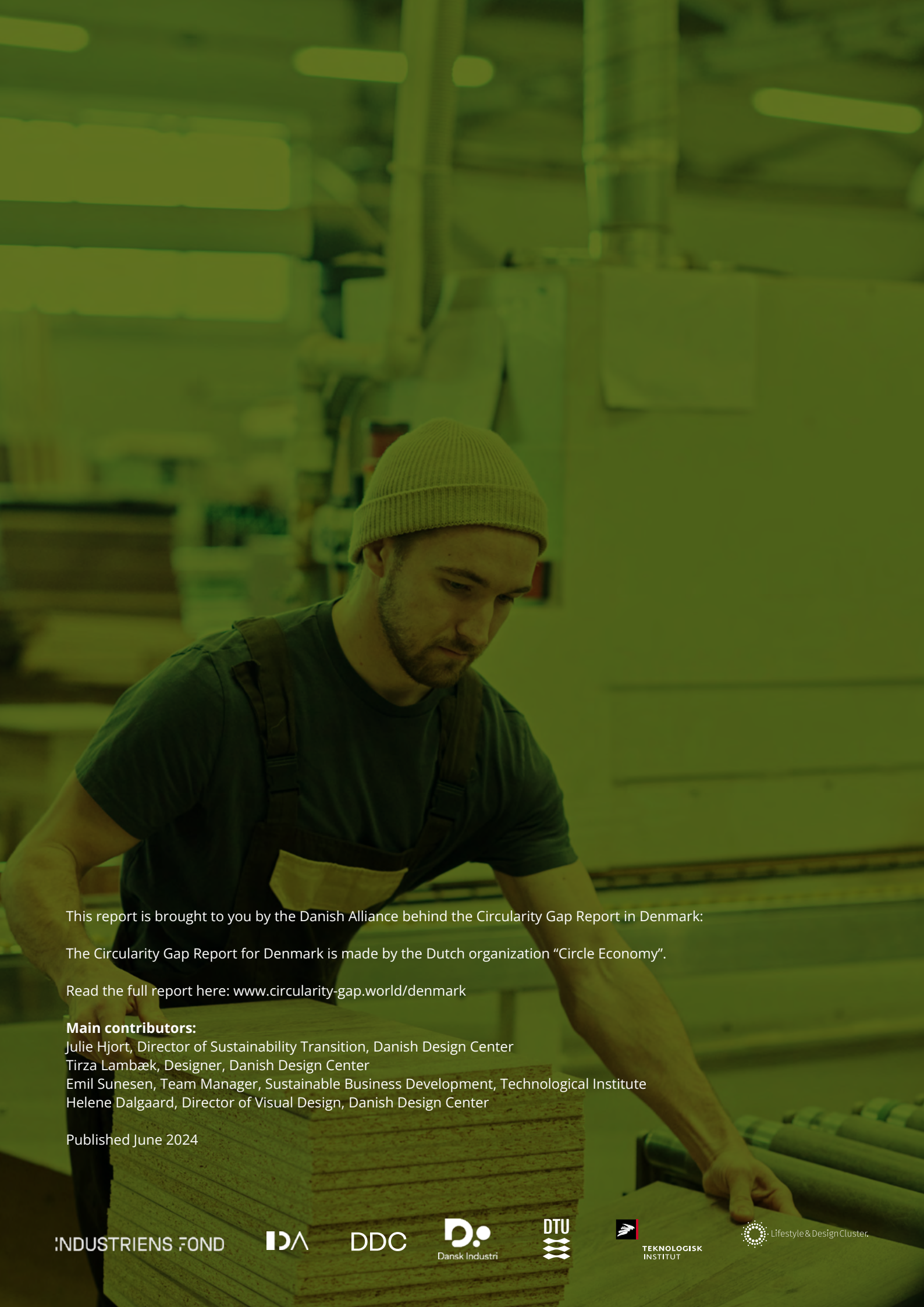
Decoupling 2030 A 2030 mission to accelerate the sustainable transition of the Danish production sector. Partners are Alexandra Institute, Dandy Business Park, The Danish Design Center, Force Technology, Technological Institute and Trekantområdet Denmark.

Ready2Loop is an innovation programme carried out by Technical University of Denmark with the purpose of supporting Danish manufacturing companies to design more sustainable and circular business models. Supported by the Danish Innovation Fund.

Motorway for Materiale Knowledge is a project which aims to strengthen Danish companies' knowledge and application of materials for the sustainable transition. By LINX supported by the Danish Industry Fund.

Zero Waste is a project that helps production companies form the circular products of the future without waste through a holistic rethinking of design, materials, production and business models. Led by Technological Institute and Aalborg University with support from the Danish Industry Fund.

Innomission Trace A broad partnership of 90 partners consisting of universities, knowledge institutions and public and private companies that have joined forces to kick-start a number of projects with focus on circular economy to ensure plastic and textiles are developed across the entire value chain. Supported by The Danish Innovation Fund.



This report is brought to you by the Danish Alliance behind the Circularity Gap Report in Denmark:

The Circularity Gap Report for Denmark is made by the Dutch organization "Circle Economy".

Read the full report here: www.circularity-gap.world/denmark

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