

Transition to circular textiles in the Capital Region

This is a summary of a *midway best practice case study* from the project *Circular Economy Beyond Waste (Action C8)*.

The Capital Region of Denmark and Gate 21 have investigated different ways of reducing the Region's emissions from the procurement and usage of textiles in hospitals. At the same time, the project has explored ways in which the Region can support the emergence of a circular textile industry for public procurement of textiles.

The project has run alongside the Capital Region's own process to procure new textiles, with an emphasis on the environmental aspects. During the project we have estimated the baseline for the CO₂ emissions from the procurement and usage of textiles in Hospitals in the Region, which is approximately 1.600 tons of CO₂ emissions a year. We proceeded with identifying ways of lowering the CO₂ emissions significantly from the textiles, thereby contributing to the Region's own internal goal of reducing 50 % of the CO₂ emissions from scope 3 emissions related to the usage of goods and services at the hospitals.

There is no such thing as a green or sustainable textile, but rather textiles with a reduced environmental impact. Despite recent developments in the field of procurement, for instance the increasing use of environmental labels, it is our conclusion that much is still to be done in order to bring emissions down. This project has therefore investigated ways of applying the principles of a circular economy, such as 1) reducing the amount of textiles items procured, 2) extending the product lifetime, 3) considering other textile materials and 4) options for their end of life.

Highlights of the investigation

Based on dialogues with market actors in the different parts of the value chain, the project selected a range of material prototypes to be further explored (for example, different samples of recycled materials). Furthermore, we have obtained specific knowledge regarding the transition to circular and more sustainable textiles for industrial use in hospitals. The following paragraphs summarize a selection of the project findings.

The conventional textile material used in hospitals for employees (T-shirts, pants, doctor coats etc.) is made of 55% virgin cotton and 45% polyester. For patients, the majority of the textile materials are made of 100% virgin cotton.

Using different materials and in different proportions could lower the emissions of the production phase, but the life cycle of a product does not end at production: If a textile product produced with lower emissions degrades faster and need to be discarded after fewer washing cycles, then no environmental benefits will be gained.

Actual experiences with the performance of new textile materials at an industrial level (such as hospitals) are scarce. Therefore, the project has selected different textile prototypes to be tested for their durability and strength at the Danish Technological Institute (DTI).

When it comes to the matter of durability, we need to further distinguish between the technical lifetime (the abilities of the different fabrics) and the actual behavioural lifetime of textile products, which depends on the behaviour of the employees and patients, which is not always as intended.

At the same time, we face some challenges with regards to the washing and drying standards in procurement of textiles for hospitals, where especially the need for high temperatures limits the range of material prototypes to be tested. Chemical cleaning (where temperatures can be lowered with the use of specific chemicals to counter the high temperatures) is an innovation that is relevant to look into further.

During the project, we also reviewed the internal policies for discarding textiles in the first place. It could be an option to rewrite the practice for when textiles should be repaired and replaced. This could also stretch the life time expectancy of the product.

The design of the textile products produced for the hospitals (for employees and patients) should also be reviewed in order to make sure that the textiles are designed to last longer and for easy disassembly (e.g. reinforcements on knees and elbows, pockets made larger to hold majority of hospital items etc.). The design process is linked to function and behaviour, which also plays a key role in choosing the different textiles materials to test in the future.

Midway conclusions

It is our understanding, that the environmentally best option can be achieved by continuing to explore and test different textile material prototypes, with a closer investigation of:

- **The different materials** (the specific mix of virgin and reused materials, with tests of the strength, performance and durability of new prototypes for the hospitals)
- **The design, technical construction and capabilities of the fabric** (prototypes evaluated in terms of the design for disassembly, reinforcement in the design in specific places including repair and reuse options for the textile determined in the procurement)
- **The optimization of usage** (testing the prototypes on employees and patients and learn more about the options for optimizing and changing current behaviour) and **trackability** (Trace the whereabouts and amount of washes pr. item)
- **Washing and drying** (exploring new processes for the prototype items and the general handling of textiles at an industrial level)
- **End of life and the current options for recyclability** with regards to textiles recycling plants in Europe at the current time and in the near future

There is a direct influence on the different elements listed above, which needs to be tested and demonstration in real life settings before any decision can be implemented in the procurement material. The project is continuing in 2023 with testing the selected prototypes at different hospitals in the region. At the same time, the project has also listed ideas and perspectives concerning the upcoming procurement, which will be considered as well, such as the idea of an introduction of a cost-pr-use pricing system, and the idea of introducing an innovation-option during the contract period linked to specific innovations goals to be achieved.