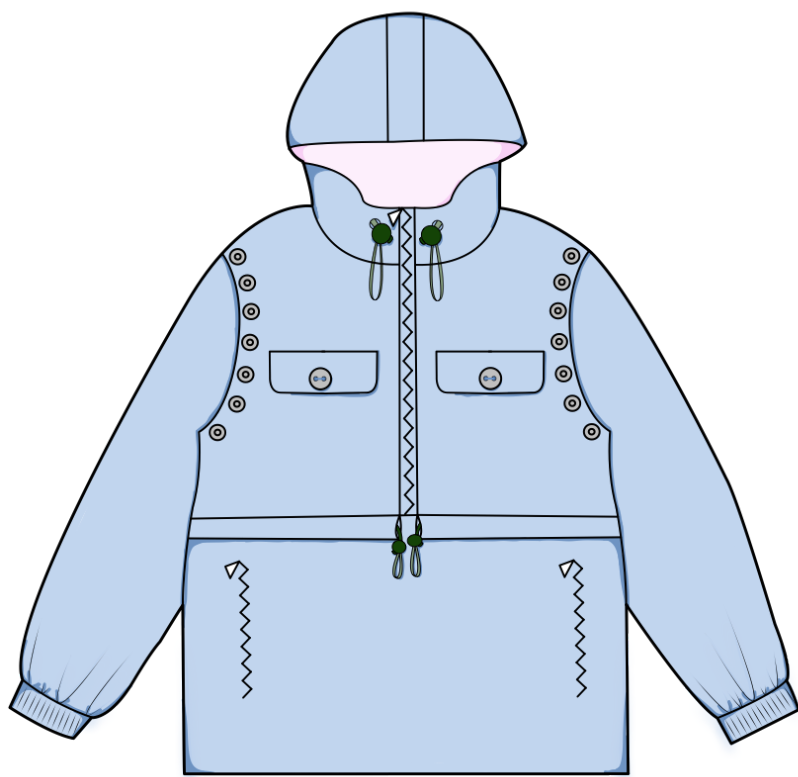


# SUSTAINABLE ENGINEERING OF AN OUTDOOR JACKET MADE FROM WASTE IN 2030

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## INTRODUCTION

Since the textile chain operates in an almost linear way, huge amounts of non-renewable resources are exploited to produce clothing that is cheap and only worn a few times. Among big problems are especially the fibre waste and the huge water consumption of the textile industry. This paper aims to illustrate the process of engineering an outdoor jacket from fibre to finished product in a sustainable way. Literature research is conducted with special focus on fibres made from waste, as well as innovative processing methods. In the practical part of the report, the manufacturing of the transformable jacket design with the corresponding zero-waste pattern is described. The objective is to give creative and thought provoking-impulses on the sustainability of a specific piece of garment and to show that it is possible to produce a jacket, that is stylish, durable, and water repellent, without consumption of further resources



## MULTIFUNCTIONAL DESIGN

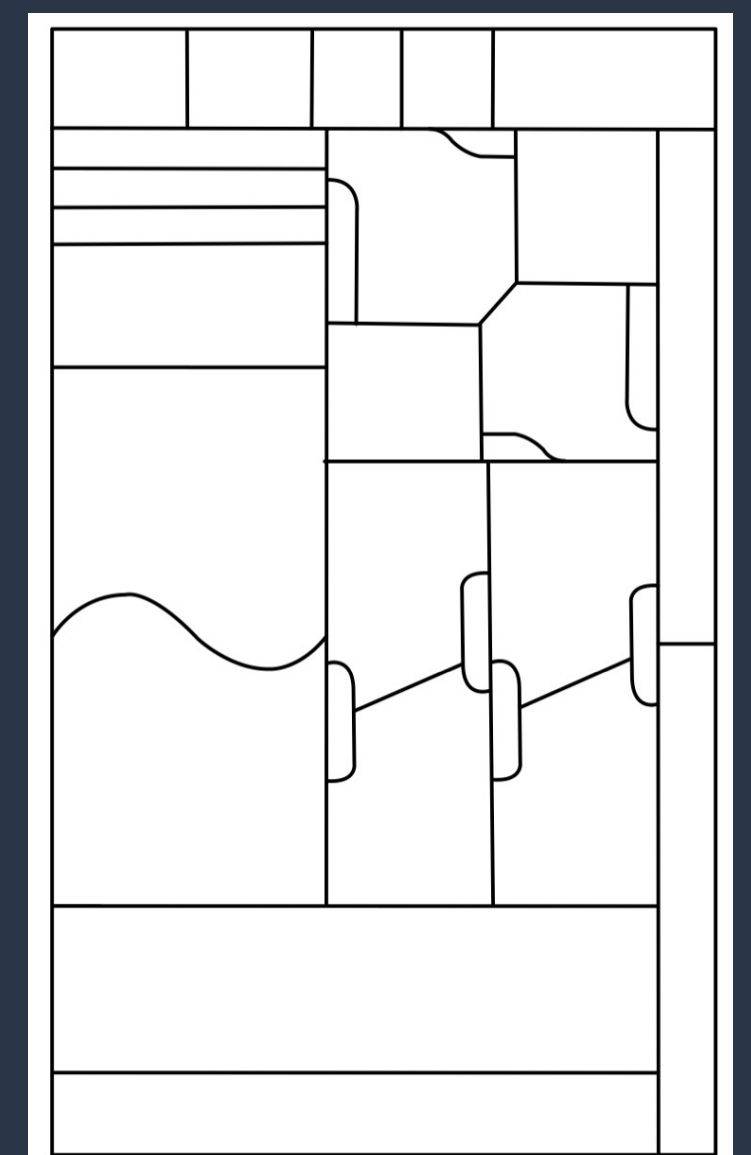
Design plays a significant part in the environmental impact an item of clothing will have over the span of its lifecycle. The designer is responsible to enable sustainable production. During the design stage the roadmap for the further production of a garment is set, therefore it is in this stage that sustainable practices must be implemented to ensure a more sustainable clothing production process. The fashion industry today is based on fast cycles of changing styles that create a culture where psychological obsolescence is becoming the norm. By designing garments with multifunctional and adjustable properties the consumers' need for the new can be minimized. Design for longevity indicates that the product can evolve alongside the owner, with the adaptability of transformable design, the opportunities to wear the garments more and for longer periods of time increases. As the garment can be altered to fit different occasions and seasons, the wearer's needs and desires are met, which in turn leads to a deeper product satisfaction. Ultimately, transformable design actively involves the consumer into the design process, since they are the ones deciding in which transformation stage, they want to wear the garment anew each time they wear it. By this, the emotional connection between the wearer and the garment is strengthened, which directly leads to better care for the garment, which results in longer usage.

## ZERO WASTE PATTERN

Since it is the intention of this project to create a jacket made from 100% waste materials, producing waste during the production of the jacket would be counterproductive. Therefore, a zero-waste pattern making approach is used to construct the jacket, ensuring a waste free production. A multitude of different zero-waste pattern making techniques exist and are being implemented by various designers all over the world. For this jacket the jigsaw approach will be used. This approach creates pattern pieces that most closely, regarding other zero-waste techniques, resemble traditional pattern pieces. In zero-waste pattern making the approach to the pattern construction process is different, as the single pattern pieces are not viewed as individually working parts but constructed to fit together like a jigsaw puzzle. Therefore, the single pieces must be created in relation to each other, as the finished pattern must fit into a perfect rectangle. Zero-waste pattern making aims to use the entire area of the available fabric in its specific length and width. Only this ensures that a true zero-waste pattern making approach is successful in its implementation. At the garment manufacturing stage an estimated 15% of fabrics remain unused and are therefore wasted. According to an estimation done in 2012 about 400 billion square meters of fabric are used for garment production in a year, across. As the production of garments has risen in the last couple of years but is still the main estimation used to this day, when talking about the amount of fabric produced worldwide. That equals 60 billion square meters of fabric that are being wasted annually in the pattern cutting process. It is not just the fabric being wasted, but also the all the materials used in the production of the fabric. The fibres and yarns, chemicals and dyes produced and used in the coloration, the time, money and labour invested into the production process. Additionally, all these factors bring about an environmental impact and the corresponding carbon footprints. A lot of precious time, energy and money could be saved if the zero-waste pattern making approach was implemented more broadly and frequently.

## RESULTS & DISCUSSION

The primary aim of this research was to explore the possibilities of reusing waste materials to manufacture a fashionable outdoor jacket. As illustrated in this paper, it can be said that a production of such a jacket is very nearly possible right now. Further research must be done, but most of what was illustrated here, can already be implemented in the production of clothing. However, the sourcing from waste must be done with deliberation. Especially the zero-waste pattern making approach and the modular transformable design process are two things that can be implemented in the industry right now. For the people working in the textile or clothing industry it is common knowledge that the industry must change its practices into a more sustainable approach. In this report it is shown that a multitude of sustainable solutions are realizable, more than are utilized at the moment. Change can happen right now, not only in small brands, that made it their mission to be sustainable, but for fast fashion brands too. Change is possible right now.



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