As more clothes are produced, more waste, or deadstock, is generated. Estimated to be up to 25% of supplies, this excess stock is attracting new attention and is increasingly seen as a reservoir of resources.

Loose ends

Assorted fabric scraps, roll-ends in all sizes, straggly cones from knitwear makers, mixed bags of buttons, zippers and trimmings are left over. For each garment made, anywhere from 3% to 10% extra supplies are ordered. This common practice allows for possible flaws in supplies and defects during manufacturing. In the past, production leftovers did not generally go to waste as secondary uses for them were often found. But, with the advent of fast fashion, the cost of deadstock on the planet and on profits is becoming more visible, and less acceptable, as seen in the negative media coverage Swedish multinational H&M received for the incineration of its unsold stock in 2017.

Reducing waste is considered one of the most important measures in sustainable practice. "From an environmental point of view, upcycling available materials should always be preferred over recycling them," says Reet Aus, an Estonian designer who has dedicated her doctoral thesis to the subject ('Trash to trend, using upcycling in fashion design', 2011). She says reusing existing waste is a simple idea that can also be cost-efficient.

The trend is gaining ground, and use of deadstock materials spun into a marketing asset by brands and retailers looking to buff their eco-credentials is increasing. In February, German online fashion retailer Zalando launched a limited-edition collection made from overstock fabrics, in collaboration with Dutch designer duo Viktor & Rolf. The 17-item range sold out in 24 hours. Seattle-based activewear brand Oiselle recently introduced Fabric Forward, limited-edition garments made from its excess fabrics. Using deadstock is a founding principle of LA-based womenswear label Reformation and menswear brand Double Eleven, launched by Nathan Bogle, who had previously founded denim brand Rag & Bone.



The collections of Estonian designer Reet Aus are made exclusively from deadstock. Each run is limited to 25 to 70 pieces, depending on fabric availability.

Laura Nestor

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Nativa by Imbotex is a thermal insulation made from the tail-ends of silk cones retrieved from silk manufacturers in the Como region of Italy.

Imbotex

Waste not

Reet Aus's own line is made exclusively from reclaimed waste materials, produced at certified clothing manufacturers in India and Bangladesh. The collection uses all types of remnants, right down to the buttons. Only the sewing thread is new. The concept is increasingly successful, and sales were up by 70% in 2017. Taking a slow fashion approach, the designer introduces only around six new styles every season. Each run is limited to 25 to 70 pieces, depending on availability of materials.

Based in Portland, Oregon, Looptworks has been manufacturing products from deadstock since 2009. "We've certainly observed a change in attitude," says company spokesperson Jason van Horn. "More companies are now aware they create excess as part of the production process and are becoming interested in partnering with brands like Looptworks to find solutions. In most cases, they don't know where to start, or lack the time or resources to deal with it."

Signs of change are also cropping up in sportswear. Outdoor brand Vaude has recently set up an upcycling workshop in its production site located at its headquarters in Tettnang, Germany. The offcuts and excess materials that accumulate during production are no longer thrown away, but instead collected and sorted and the larger pieces used to sew new products. Vaude believes the workshop will help reduce the waste it generates by 900 kg per year.

Run of the mill

In textile manufacturing, certain production processes, such as extrusion, spinning and non-wovens, allow waste generated during manufacturing to be immediately reintegrated. This post-industrial recycling is far from new, and as such is usually excluded from recycling standards. Yet, here too, change is in the air, as the 'closed' loop is opening up to reprocess larger waste streams.

Italian insulation maker Imbotex has developed a padding made from leftover silk cones from the Como regions silk manufacturers. The pure silk scraps and ends of cones are collected before dyeing and used to make Nativa thermal insulation, which won an ISPO award in 2016. In addition to its 'deluxe' content, the company says the silk padding offers protection from both cold and warm weather. Imbotex has since introduced Recashmere, a thermal insulation made from

German outdoor brand Vaude has hired two Syrian refugees to work in its newly created upcycling workshop. Funding (€70,000) was provided by the German Federal Foundation for the Environment (DBU).

Vaude



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recycled cashmere sweaters.

Marchi & Fildi, a yarn spinner also based in Italy, has partnered with knitting factories in Bangladesh that supply the spinner with excess cones and fabric scraps to make its recycled cotton Ecotec yarns. "They contain up to 80% recycled materials and require no additional dyeing, as the fabric scraps are sorted by colour in Bangladesh," Vittoria Marchi tells *WSA*. A lifecycle assessment conducted for this range found that water use is reduced by 77.9%.

Big data

To start finding possible uses for deadstock materials, it is first necessary to find out how much is available. Both Reverse Resources, an organisation based in Bangladesh, and Reet Aus are developing programmes to monitor these unused stocks. With funding from H&M's Global Change Award, Reverse Resources published a white paper, 'The Undiscovered Business Potential of Production Leftovers within Global Fashion Supply Chains: Creating a Digitally Enhanced Circular Economy', in August last year. Its research, based on data collected at factories in China and Bangladesh, show that manufacturers producing textiles and clothes for fashion brands and retail outlets generate on average 25% of unused virgin materials. This percentage is much higher than previously perceived, according to the report.

Earlier research by Timo Rissanen, assistant professor of fashion design and sustainability at Parsons The New School for Design in New York, estimated that "approximately 15% of textiles intended for clothing ends up on the cutting room floor". This paper 'From 15% to 0: Investigating the creation of fashion without the creation of fabric waste', dates from 2005.

Reverse Resources bases its evaluation on data from seven manufacturers. "We visited many more but were able to obtain the most precise information from the vertically-integrated factories," Nin Castle, co-founder of Reverse Resources and one of the authors of the white paper, tells *WSA*. The report qualified as waste unused fabrics in sizes of 18 inches to 5 yards. The larger bolts of fabric were not counted as these "generally find a next-best user, in clothes manufactured for local markets," she adds.

To help companies reduce waste, Reet Aus has launched her own certification method, including a software programme called Upmade. The system tracks material usage, calculates leftovers and is designed to enable a company to benchmark its management of waste. "Many companies have no idea how much unused materials their production runs generate," she says. Her research indicates that wastage represents 18-25% of materials used, which can "amount to millions of metres. Some of it is sold, but a large amount ends up in landfills," she says.



2017 Redress Design Award winner Kate Morris created a knitwear collection with Hong-Kong based The R Collective that partners with local manufacturers to find uses for leftover fibre cones from knitwear production.

Kara Chung

The best solution for Ms Aus is that brands upcycle their own excess stock. "Some companies won't want to buy another brand's leftovers or want their materials used by others." Reintegrating their own fabrics is also easier as they already know its type and quality.

So far, four companies have been certified by Upmade, the largest of which, Bangladesh Export-Import Company (Beximco), manufactures over 240 million garments every year and is one of the main apparel manufacturers in south-east Asia, says Ms Aus.

The software programme in development at Reverse Resources is also designed to monitor unused materials and off-cuts and provide data that will help factories improve their waste management processes. "In the early days of off-shoring, brands didn't want to know about the waste generated, but awareness is growing because of the sustainability goals brands are now committing to," Ms Castle claims.

Still in development, the programme will be compatible with software systems currently used by factories. Reverse Resources also believes the information flow will create an opportunity for factories to reuse the fabric themselves. Without the information, brands cannot "remanufacture" their materials, says Ms Castle.

Lack of incentive

The current system in which brands outsource fabric buying to sub-contractors has, up till now, proceeded untroubled by data or monitoring.

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Most often, pattern-making optimisation, like the programmes developed by technology provider Lectra, has already contributed to reducing waste. The supplementary yardage ordered to allow for flaws in materials is inherent in the manufacturing industry and does not necessarily go to waste, as Arnaud Coquelle points out. Head of an integrated design, development and production studio based in Bordeaux, France, he has a long experience of working in Asia for performance sportswear brands. His view is that premium factories generally manage excess materials well. "Companies that make upscale clothes using fabrics that cost $8 to $12 per metre will seek to limit wastage. In any case, the cost of this excess is often paid for by the brand and if the contractor finds a buyer for its leftovers, this goes to increase its margins," he says. When casual wear brand Esprit wanted to reuse its own excess stock, it had to repurchase the material from its contractor, who did not want to lose the income it generates from selling leftover fabric rolls.

The classification of waste materials going through customs is yet another challenge facing those seeking to find users for leftover supplies. "Excess fabric stock generated by Hong Kong factories is classified as potentially toxic and cannot be exported to China," says Hannah Lane, communications manager at Redress, a Hong-Kong based NGO dedicated to reducing textile waste in the fashion industry. At Lenzing, the expansion of its Refibra programme that turns cotton offcuts into lyocell yarns also faces this obstacle, as customs classifications do not allow waste materials to cross borders.

Hurdles remain, but one of the findings of the Pulse Report is the belief that the price of virgin materials will steadily increase. As information on the cost of waste itself becomes known, and innovative designers and companies imagine smart solutions for these materials, the many loose ends may be seen as economically useful and resourceful.

Systematising remanufacturing

The white paper published by Bangladesh-based Reverse Resources includes a section dedicated to remanufacturing solutions, of which it details three ways the fashion industry can reduce the waste it generates. All propose methods of reusing deadstock in garments, whether invisibly, visibly or in styles designed specifically for a certain type of unused stock. Invisible remanufacturing has the greatest potential, says Reverse Resources co-founder Nin Castle and it can have a significant impact: "If a jeans manufacturer uses cotton fabric off-cuts for the fly facing of a typical five-pocket pant, it can save up to 240 yards of denim in an 11,000-piece production run." The same goes for the waistbands of chinos or the cuff facings of shirts.

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