

the fashion industry

road-testing sustainable design strategies

HOW THE WAY WE DRESS EVERY DAY CONTRIBUTES TO THE BIG PICTURE

The fashion industry is undergoing rapid change— prices have dropped and volumes have increased immensely. In a world where population and consumption is booming and resources are finite, this model of over consumption is no longer viable, but what are our options and how can we satisfy our physical and cultural clothing needs without jeopardising the future?

As a product-oriented domain, fashion is fast becoming the epitome of consumption-driven growth; product life is artificially short and material flows and waste correspondingly high. Jana Hawley reflects this view, stating that the glut of clothing accumulation stems from 'planned obsolescence' and the very function of fashion fuels the excessive need for change, and the constant replacement of garments¹ leading to the rise of textiles in landfill.² Marketing plays a hand in this behaviour by linking products such as clothing to non-material needs, and by suggesting that consumption of fashion is a way to signal wealth, identity and social status.³ The act of wearing clothes is implicated in many unsustainable social and environmental effects.

Fashion has been blamed for being the 'supreme discipline in consumption and creation of our present consumer culture'.⁴ The prevailing fast fashion cycles and unremitting fads, rife in high streets across the world, create the current paradigm of fashion as a short-dated and constantly changing, leading to burgeoning demand and bloated wardrobes.⁵

Glancing up the supply chain, more unsustainable practices become apparent. During production of this relentless fashion flow, the environmental footprint is vast, including water, synthetic fertilisers and pesticides, toxic dyes and energy use (typically from fossil fuels), not to mention human rights abuses in developing countries.⁶ This, however, pales in comparison to the environmental damage done once consumers take garments home. According to Kate Fletcher, as much as 82 per cent of energy use, 66 per cent of solid waste and over half of the emissions to air relating to clothing are amassed during washing and drying.⁷ Disposal also follows this trend of environmental strain, with 30 kilograms of waste per person per year ending up in landfill,⁸ where toxins can be released in an uncontrolled environment.⁹

Fashion is a culprit in assaulting our natural environment and creating excessive consumer behaviour; however, it also plays an extremely important function in society. The wearing of clothes has a powerful role in self-expression and cultural identity. The need for wearing clothing surpasses simply shelter and protection from the elements, extending in to mass participation and communication. Julia Schwartz and Gyöngy Laky, San Franciscan designers agree, maintaining that fashion not only acts as protection but also provides means for discourse in society.¹⁰ Fletcher shares a similar view in *Sustainable Fashion and Textiles*, stating 'fashion is at the heart of our culture and important to our relationships, our aesthetic desires and identity'.¹¹

Clearly the future must include clothing as a necessary and meaningful aspect of society. However, the environmental impact of present practices is unsustainable and the fashion system must embrace sustainable design tools. There has been movement towards sustainable fashion, with many Australian major retailers offering some form of environmentally friendly initiatives. To differing levels, companies have started recycling, dabbled in organic materials and introduced reusable packaging. These measures are cosmetic and fail to address the deep rooted problems with the current fashion system. According to Van Dyke, 'the fashion industry's efforts to introduce sustainable fashions have been superficial and of little effectual consequence'.¹² The Band-Aid measures proffered by corporations doubly attack any real action toward sustainable fashion as they mislead consumers, leaving us confused, sceptical and unwilling to spend discretionary income on dubious sustainability claims. Clothing industries need deep and holistic measures of sustainability in order to chart the new territory of global warming, overconsumption and dwindling resources.

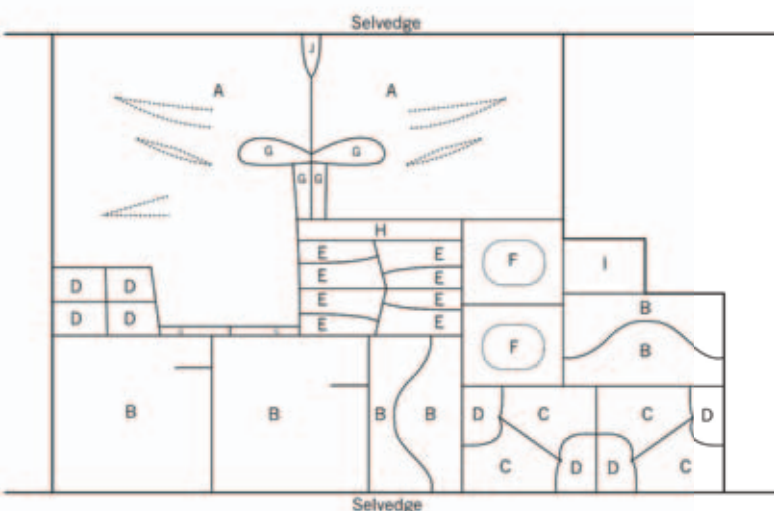


DESIGN PRINCIPLES AS INTERPRETED BY FASHION DESIGNERS

The understanding and mainstreaming of sustainability has encouraged enthusiastic development of design strategies for sustainability for products as varied as photocopiers and vacuum cleaners. The fashion industry has appropriated many of these strategies with some novel applications. Some designers are exploring new frontiers of sustainable design principles and have been world leaders in applying sustainable strategies. There are also some traditional fashion systems that are fine examples of 'new' sustainable design approaches, such as Product Service Systems (PSS), which are embodied in the traditional 'formal hire' model. Here we explore some of the most innovative.

PRODUCT SERVICES AND SYSTEMS

Product Service Systems focus on designing a combination of products and services jointly capable of fulfilling wants and needs.¹³ This idea shifts thinking from 'providing a product' to 'fulfilling a need', transferring from a functionality focus to a satisfaction focus. This has led to a dematerialisation of delivery: for example, iTunes delivering music without the use of physical CDs or cassettes. A less material-intensive method of delivery has obvious environmental benefits with less volume in a system, and less volume in landfill.



Product Service Systems are already embedded in the fashion industry, with garment rental a common practice for formal occasions. This system allows consumers to rent a garment for a specific event then to return it for cleaning and repair. Hospital gowns are another example of this model, with companies providing patients with experience-specific clothing, without taking physical ownership. This, again, keeps products circulating at the use phase for longer, reducing material flows and landfill. This system currently only services very specific markets, but could be explored to provide services to a broader segment of society, shifting garment ownership from consumers to clothing leasers, giving clothes more wear, centralised cleaning and expert repair, extending life, and decreasing flows to landfill.

DEMATERIALISATION

The clothing product service systems are good examples of dematerialisation from a consumer perspective, but there is still a requirement for clothes. To really dematerialise clothing, radical systems need to be implemented. Adele Varcoe has been experimenting on

the edge of dematerialisation and fashion. Her recent exhibition iFOLD at the L'Oréal Melbourne Fashion Festival showed models clothed in their own skin using folding technologies to provide them with ceremonial 'dress'. This radical dematerialisation of the wardrobe poses an answer to sustainability quandaries; however, the cultural context is far removed from the present.

Also between PSS, dematerialisation and social innovation are newly popular clothing exchanges taking place in cities across the world. Generally people with similar lifestyle and clothing preferences gather in a central location and swap clothes. This system gives consumers a chance to experience the new purchase buzz without increasing material flows, and keeps garments circulating through wear for a longer period before end of life.¹⁴

LIFE CYCLE ANALYSIS

A life cycle analysis is a tool for designers to appraise the environmental impact of each stage of product life, extraction, production, delivery, use and disposal.¹⁵ The aim of a life cycle assessment is to assist designers in planning a product or system in order to minimise the impact on the environment throughout the life span. It helps to map the wider consequences of a product, and identify areas of biggest impact, and potential improvement to focus resources.

Fashion companies are using life cycle analyses to determine the best area to focus on improving environmental performance of apparel product. A life cycle analysis on the environmental impact of a Chesty Bonds 100 per cent cotton singlet was conducted by RMIT textiles testing lab for Pacific Brands. According to sustainability manager Peta Lowry, the washing and drying posed the area of greatest damage. Levi's also found during a life cycle analysis of their 501 jeans that the area of most opportunity for improvement was during care.¹⁶ Both companies used this information to design care instructions encouraging consumers to use less energy intensive washing and drying methods.

CRADLE TO CRADLE

Cradle to cradle is a design strategy that aims to use waste from one product lifecycle as feed stock for the next product and was developed by William McDonough and Michael Braungart. In cradle to cradle, material cycles from extraction, design, use and disposal, back to extraction in a closed loop. The loops are divided into technological and organic, with technological waste used as feed stock for the next industrial process, while waste from organic systems is used as nutrients for the next crop of plants.

In the realm of fashion, technological cradle to cradle methods have been pioneered by Japanese fibre manufacturers Teijin Fibres Limited, who use polyester as feed for a wide product offering in their ECO-CIRCLE line.¹⁷ Post-consumer clothing and other polyester fibre products collected by Teijin are milled and purified and recycled in to virgin quality polyester feedstock. This form of 'fibre-to-fibre' recycling was shown to cut 84 per cent of energy consumption compared to the production of polyester fibres from petroleum, and to reduce 77 per cent of CO₂ emissions compared to incineration of the product without recycling by the Ministry of Economy, Trade and Industry, Japan.¹⁸

Vau De has also developed cradle to cradle technology, completing an entire garment including zippers, clasps, stitching and tags out of polyester 'Ecolog Network'. At the end of line, instead of time consuming disassembly, the entire garment can be added to the feedstock and returned to virgin quality polyester.¹⁹

Kira, corn fabric, is an organic example of cradle to cradle textiles. The fabric is made in a similar method to viscose from corn starch. At the end of the life cycle, the fabric is used as compost for the next crop of corn.



BIOMIMICRY

Janine Benyus documents different approaches to modelling industrial systems on natural eco-systems through biomimicry.²⁰ Biomimicry uses natural phenomena as inspiration for developing products, for example a solar cell inspired by a leaf. The dominant ideology is that nature, through time-tested methods, can provide solutions to many contemporary problems, including energy, food production, non-toxic chemistry, transportation and packaging.

Biomimicry has influenced dirt-reduction finishes for textiles by copying the surface structure of lotus leaves. Lotus leaves are covered in tiny lumps called papillae, which force water droplets to hover above the surface. This ensures minimal contact confined to the tips of the papillae and the adhesive forces that would otherwise cause a droplet to spread are also minimal. Instead, the water's surface tension forces prevail and invariably cause the droplet to form a spherical globule and roll off. Particles of dirt, which also have hardly any contact with the leaf or treated fabric, are carried along by the droplets and washed away without any need for detergents or scrubbing.²¹

Teijin of Japan has also developed a colouring process taking inspiration from the Morpho butterfly. The scales on the butterfly's wings are made of protein layers refracting light in different ways: the resulting colour is a product of light reflecting from the surface, rather the presence of pigment. This means that no dyes or pigments are necessary in producing coloured fabric, reducing consumption and industrial waste.²²

WASTE HIERARCHY

The waste hierarchy is a list of approaches to managing waste, arranged in order of preference starting at avoidance, through reuse, recycling, recovery and, least preferable, disposal. This tool can be used by both product designers and organisations to minimise environmental impact.

ZERO WASTE

In a waste hierarchy, the first priority is to prevent waste from occurring, and this is the premise of zero waste fashion design, a concept applied to the design and construction of garments. Timo Rissanen has been a strong voice in this area, promoting garment cutting that uses every part of a roll of fabric.²³ MATERIALBYPRODUCT is a fashion label operating with a zero waste philosophy. Patterns are cut using every part of the fabric, including selvedge. All garments that remain unsold at the end of a season are taken back and individualised into semi-couture high-value items. Garments are invested

with emotion and experience, leading to meaningful relationships with the wearer and longer life providing a shift to slow fashion.²⁴

SLOW

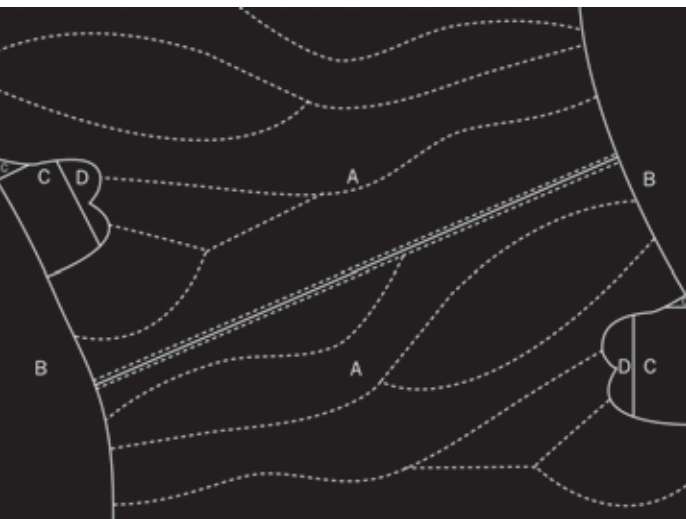
Slow is a form of social innovation that encourages people to seek satisfaction by decreasing their rate of consumption. Slow living explores the idea of 'slowness', as it investigates the growth of satisfaction in line with a decrease in speed. The slow movement is a reaction to the frenetic speed and excessive consumption of modern life. It aims to refocus communities on the simple pleasures and higher satisfaction gained from a slower approach to life.²⁵

Slow fashion is a lifestyle practiced by many people who are not necessarily consciously advocating for sustainable fashion, as it is achieved simply when clothes are worn for a long time. Levi's 501 jeans are a good example of this, with the unchanging fit and wash transcending years of fickle fashion cycles. Some fashion designers are actively pursuing slow fashion as a strategy; at first glance this appears counterintuitive, as fashion businesses make more profit from selling more clothes. Scratching the surface, however, reveals well-constructed high-value garments and long-lasting relationships with customers, with greater loyalty, and therefore lower risk. Designers who subscribe to this philosophy also appear to have more creative input to the design process, developing locally relevant garments.

LOCAL

Local is another social innovation bringing environmental benefits. The aim of local is to reduce the transport of produce, thus reducing energy consumption and carbon emissions. The idea was brought to public attention by Alisa Smith and JB Mackinnon, who only ate food from a 100-mile radius for one year.²⁶ In the fashion world, this





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is intuitive, as many people like to buy clothes from local designers as there is a connection to the designer and garments.

DESIGN STRATEGIES AND CONSUMERISM

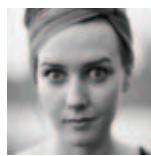
The most innovative sustainable fashion design will never be able to have a positive impact on the industry without help from consumers. Tim Flannery, opinion leader in climate change and society, left the responsibility with the audience at the recent Deakin Lecture opening address, Innovation in a Changing Climate.²⁷ Change must be driven by the people; we have the ultimate power when it comes to bringing new ways. We are already demanding more sustainable products. Connie Ulasewicz suggests that we are 'becoming the agents for change' by using our purchasing decisions to advocate for 'welfare, society and the planet'.²⁸ Consumers have a significant role to play in shifting towards sustainable fashion. Designers are influential in offering solutions, but without consumers they operate in a vacuum. Every product designer needs feedback from people and positive reinforcement, through sales, can send powerful messages to a fashion house, and affect the environmental impact of each garment.

To drive change, we should be conscious that every purchase impacts on the fashion system. If we are seduced by a cheap, environmentally-unfriendly top, it signals to the designer that we approve. If we purchase environmental products, we signal that this is what we want. The question is how to judge, and consume, with a clear environmental conscience. Allwood, Larson, Malvido de Rodrigues and Bocken have developed some comprehensive guidelines

as part of their *Well Dressed?* Report in 2006 to help guide us in making decisions about what we wear and how we wear it.

CONSUMER ACTION

- Buy second-hand clothing and textiles where possible.
- Buy fewer more durable garments and textile products.
- When buying new products, choose those made with the least energy and least toxic emissions, made by workers paid a credible living wage with reasonable employment rights and conditions.
- Lease clothes that would otherwise not be worn to the end of their natural life.
- Wash clothes less often, at lower temperatures and using eco-detergents, hang-dry and avoid ironing where possible.
- Extend the life of clothing and textile products through repair.
- Dispose of used clothing and textiles through recycling businesses, who will return them for second-hand sale wherever possible, or otherwise extract and recycle the yarn or fibres. *



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