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PRODUCT DEVELOPMENT IMPLICATIONS OF SUSTAINABLE CONSUMPTION



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This paper traces the origins of the concept of sustainable consumption and identifies some key theoretical and practical concerns. Distinguishing sustainable consumption from green consumerism, the potential implications for new product development and design are explored. The focus is on the environmental impact of consumer products (as distinct from packaging). It is suggested that while a product-centred approach may underlie green consumerism, sustainable consumption implies 'sufficiency' as well as 'efficiency,' and broader psychological and socio-cultural considerations must be taken into account. Designers will need to respond to increasing pressure for consumption patterns that have a reduced environmental impact.

SUSTAINABLE CONSUMPTION: RECENT HISTORY



Although more than a decade has passed since the publication of the Brundtland Commission report on sustainable development (World Commission on Environment and Development, 1987), there are few signs of consensus on the implications for consumption in the industrialized world. The argument that the characteristics of many products manufactured and sold must change is readily accepted. The 'green consumer' trend of the late 1980s saw the emergence of a new market segment comprising products designed for a reduced environmental impact. Since then, however, the limitations of green

consumerism have become increasingly evident.

In 1992 the United Nations Conference on Environment and Development (the 'Earth Summit') provided an important stimulus for an emerging debate on 'sustainable consumption'. In a key chapter of *Agenda 21*, the programme of action agreed at the summit, it was accepted that 'the major cause of the continued deterioration of the global environment is the unsustainable pattern of consumption and production, particularly in industrialized countries' (United Nations, 1999). Two key international meetings were subsequently held in Norway at which an attempt was made to define sustainable consumption, various interest groups began to explore the implications of the concept, and an agenda for action was prepared (Ministry of Environment,

Norway, 1994, 1995). Subsequent conferences and seminars refined the concept further (e.g. Ministry of the Environment, Norway, 1998; OCEES, 1999).

Despite this progress, consensus about the change in lifestyles implied for people in affluent industrialized nations remains distant. Will it suffice for us to consume less harmful products, or do we need to consume far fewer products? Evidence discussed below suggests the need for a radical departure from contemporary consumerism, involving a reduction in the consumption of products, and not merely a change in product characteristics. In other words, the approach of green consumerism is inadequate and sustainable consumption must embody a more profound change in consumption patterns.

Such a contrast between green consumerism and sustainable consumption is summarized in Figure 1, although it should be stressed that this interpretation of sustainable consumption is not without controversy: it is widely recognized that the relationship between 'sustainable consumption' and 'reduced consumption' is problematic (Stø, 1995). Some relevant theoretical and practical issues thus need to be addressed before the implications of the debate for designers are explored. The focus will be on

green consumerism	sustainable consumption
buying different products	consuming less
essentially positive about consumption, although in modified form	inclined to view consumption beyond basic needs negatively
technological advance an important factor in achieving change	emphasis on lifestyle and behavioural change, with a limited role for technology
focus on supply side intervention (i.e. production)	focus on demand from 'end user'
consumers respond to information about appropriate products	consumers identify alternatives to acquisition
gradualist approach to change preferred	major change seen as urgent and essential
traditional economic growth replaced by 'green growth'	quality of life improved without increasing physical output

Figure 1. Green consumerism and sustainable consumption: contrasting approaches.

environmental considerations, although the social dimension to sustainability is acknowledged.

CONCEPTUAL EVOLUTION

Sustainable consumption may be defined as 'patterns of consumption through which the purchase and use of goods and services meet people's basic needs while minimising any environmental degradation' (Cooper, 1998). Any definition has its limitations and this one must be qualified by the widely differing opinions about what constitutes need, but it offers a starting-point for debate.

As a theoretical concept, the term sustainable consumption is hard to grasp, if not contradictory: how can a word that means 'keep going' be used alongside one that means 'use up'? The relationship between physical and monetary consumption adds a further complicating element. It is quite possible for increased consumer expenditure to be the source of a reduced consumption of new products: for example, higher income could be devoted to buying longer-lasting appliances. In addition, the social dimension to sustainability is not well understood and is subject to different interpretations of equity, making it hard to integrate into the concept of sustainable consumption.

Stø and Strandbakken are right to suggest that sustainable consumption acquires greater clarity when used with a conceptual tool such as 'environmental space', which is used to measure the capacity of the environment to support human activity (Stø, 1995; Strandbakken, 1995). Environmental space describes the total amount of resources (such as energy, metals, minerals, land, water and wood) that can be used in a specified region over a predefined time period without breaching environmental 'limits' (i.e. causing excessive damage) (McLaren, Bullock and Yousuf, 1998). It thus enables alternative consumption patterns to be

considered in the context of sustainable resource use.

Global equity is assumed but this is subject to different interpretations depending on whether equality of outcome or equality of opportunity is favoured and whether or not past consumption is taken into account.

There are, in addition, several other tools which have been developed in recent years. These include 'ecological backpacks' (or 'rucksacks'), which involves measuring the weight of materials such as soil, rock, metals and minerals displaced as a result of human activity, and 'ecological footprints' which involves measuring the area of land used per capita to support prevailing consumption patterns (Carley and Spapens, 1998). Although neither has been extensively used in formulating policy, they offer considerable potential in understanding the practical implications of sustainable consumption.

In summary, the meaning of sustainable consumption is still being explored by a wide range of interest groups. Our understanding is still evolving. The European Commission recently concluded that the concept is not well enough defined to be integrated into the process of creating integrated product policy, an approach which aims to avoid solving one environmental problem at the expense of others (Ernst and Young/SPRU, 1998). In Britain, meanwhile, academics at a series of Economic and Social Research Council seminars which aimed to improve understanding of the concept found that people's interpretations varied significantly according to their discipline and background (OCEES, 1999). A tendency among those from environmental disciplines to adopt a critical stance towards consumption, based on concern about sustainability, contrasted markedly with the more positive approach of sociologists and social anthropologists inclined to view consumption as a celebration of human identity and self-expression. Research in progress is continuing to enhance academic understanding (Reisch and Scherhorn, 1999).

PRACTICAL APPLICATION

There appears to be a consensus between governments, industry and environmental organizations that consumption in its present form is not sustainable. However, critically, the extent to which sustainable development implies a reduction in the consumption of physical 'end products' remains unclear.

More data is needed, although progress is being made. Using the environmental space concept, McLaren, Bullock and Yousuf (1998) concluded that within the next 50 years industrialized countries must reduce their impact on the environment by 80 to 90 per cent. More specifically, they calculated that the UK needs to reduce its use of key resources by amounts ranging from 15 to 100 per cent by 2050, as shown in Figure 2. Although the precise figures might be subject to dispute (Moffatt, 1996), the need for substantial change in consumption patterns is clear.

How might such a reduction be achieved? One approach is to assess the potential for increased 'eco-efficiency', in other words, using energy and materials more efficiently in the supply of goods and services in order to reduce their environmental impact. Von Weizsäcker, Lovins and Lovins (1997) have argued that greater eco-efficiency could allow consumption to be doubled while environmental impacts are halved, the 'factor four' effect. They have identified many

	2010	2050
energy	-30%	-88%
land	-7%	-27%
timber	-65%	-73%
water	-15%	-15%
aluminium	-22%	-88%
steel	-21%	-83%
cement	-18%	-72%
construction aggregates	-12.5%	-50%
chlorine	-25%	-100%

Figure 2. Summary of environmental space targets for 2010 and 2050.

practical and theoretical examples of increased energy and materials productivity, such as the 86 per cent reduction in energy consumption in fridges achieved since the 1970s through the use of more insulation, better seals, better designs, bigger coils and more efficient lights, compressors and controls. Others examples include:

- office furniture by Herman Miller designed for durability through ease of repair and re-upholstery
- the 'hypercar' developed by the Rocky Mountain Institute, which requires far less steel and aluminium and reduces fuel use tenfold by combining ultra-light construction, a hybrid-electric engine and several energy saving devices
- the FRIA Cooling Chamber, designed by Ursula Tischner, which combines the features of a traditional larder with the use of modern refrigeration technology
- the development of compact fluorescent light bulbs to replace conventional incandescent light bulbs, and
- 'superwindows' with transparent high-tech films that allow light into buildings rather than heat.

Despite uncertainty over the meaning of sustainable consumption and potentially radical practical implications, the concept has been widely adopted by governments and industry and is increasingly used in international policy debate. Political pragmatism and commercial self-interest have, however, occasionally demanded a link with 'sustainable production.' The theme of the second meeting in Norway was broadened to 'Sustainable Production and Consumption,' presumably to reassure industry and governments that the emphasis could be changing products rather than reducing output.

The World Business Council for Sustainable Development produced an industry perspective shortly after the two meetings in Norway (Falkman, 1996). More recently, the OECD (Organisation for Economic Co-operation and

Development) has published a summary of policy measures on sustainable consumption being taken by major industrialized countries (OECD, 1998). UNEP (the United Nations Environment Programme), which for several years has had a working group on sustainable product development, has also launched a programme of activity on sustainable consumption aimed at government and industry which focuses on life-cycle assessment, marketing and advertising, and eco-design (UNEP, 2000).

The general public, meanwhile, has remained largely disengaged from this debate. In Britain there are many people who could be described as 'green consumers:' the National Consumer Council (1997) has estimated that some 36 per cent of the population actively look for products considered to be 'environment friendly' and are prepared to pay a premium price. However, there appears little enthusiasm for radical changes in lifestyle towards simplicity or frugality, nor any firm evidence that 'downshifting' is a significant trend. People may accept that increased affluence will not necessarily bring happiness, but most are unconvinced about the desirability of consuming less. As a recent seminar report concluded, 'for the affluent there is a fear of "giving up" their lifestyles and for the poor there is a resistance to "doing without" ' (Ministry of the Environment, Norway, 1998, p5). Most people still associate reducing consumption with a degree of sacrifice, such as less personal convenience or a more limited choice of products. Thus despite the campaigning zeal of radical anti-consumerism campaign groups such as Enough (the co-ordinators in Britain of International Buy Nothing Day), the possibility of 'less without loss' lacks popular credibility.

IMPLICATIONS FOR DESIGNERS



What, then, are the implications of this debate for

designers? Interest in the possibility of 'environmentally responsible' product development can be traced back to the early 1970s, aroused by the prospect of environmental legislation and the first signs that consumers were taking environmental factors into account when purchasing products (Dermody and Hanmer-Lloyd, 1995). Early influences included authors such as Papanek (1984), whose groundbreaking work *Design for the Real World*, first published in 1971, aroused much controversy by urging designers to take greater account of environmental and social considerations in their work.

Since then, over the past 25 years, environmental criteria have been increasingly taken into account in the design process, an approach variously described as design for environment, eco-design and green design and sustainable product design (Mackenzie, 1991; Burall, 1991; Fiksel, 1996; Brezet and van Hemel, 1997). Products have been developed which have a reduced impact on the environment compared with their predecessors or other models, examples of which appear in Figure 3.

However, as the need to overcome environmental degradation and reduce threats such as climate change has become more urgent, it is necessary to progress further to

wet appliances (washing machines, dishwashers) with reduced energy and water consumption
refrigeration equipment with reduced energy consumption
'Remarkable' pencils made from recycled vending cups
pens made from recycled plastic or from cardboard
'Patagonia' fleece jackets made from recycled plastic bottles
'Hess Naturtextilien' wedding dresses made from silk, hemp and organic cotton, and available to rent
washable cotton nappies
'Freeplay' clockwork radios and torches
low energy light bulbs
solar-powered battery chargers
toothbrushes and wash-up brushes with replaceable heads
'Curva' rulers made from venetian blind slats

Figure 3. Examples of products designed for reduced environmental impact.

the more challenging demands of sustainable consumption. As suggested in Figure 1, the focus will switch to the end user rather than the production process and the starting-point will not be the potential for technically improved, 'greener' products but a more fundamental evaluation of how people's needs may be met sustainably. This could also involve a reassessment of the nature of 'need,' a concept that industry has rarely had to confront, and one which clearly raises threats as well as opportunities (SustainAbility, 1995).

In other words, in moving beyond green consumerism to sustainable consumption it appears necessary not only to address efficiency, 'getting the same goods and services out of less material', but also sufficiency, 'getting the same welfare out of fewer goods and services' (Carley and Spapens, 1998). In this new context, 'product development' has to be interpreted broadly: it will involve finding a mix of products and services through which consumers will be able to buy less, use less, and dispose of less without suffering a loss of wellbeing. As a consequence, designers and others involved in the product development process will, increasingly, need to be skilled in understanding consumer psychology and the forces which drive consumerism as much as the commercial pressure to improve the technical efficiency of products.

PRODUCT POLICY

Consider first, however, the approach to the development and design of products which sustainable consumption might involve.

Ideally, every new product will be designed in such a way that its environmental impact is minimized through good practice, including the use of renewable or recycled materials, a low energy requirement, the avoidance of toxic



substances, and ease of repair, upgrading and recycling. In the recent history of green consumerism such an approach has generally been applied only to a limited range of products considered sensitive to criticism, and these products have often attracted a 'green premium'. Consequently it has often been hard for producers to sell beyond a limited market of highly committed consumers. In future, environmental considerations will need to be regarded as an essential element in the design process, just as safety considerations are today.

All products will have to be evaluated for their environmental impact and consumers will expect to have access to this information. Strictly speaking, there is no such thing as a truly 'sustainable' or 'green' product. All products involve negative environmental impacts at some stage in their lifecycle. The aim is therefore to determine priorities. Peattie (1995) proposes use of an 'eco-performance continuum' through which products may be classified on a scale according to their likely effect on the environment. Sophisticated techniques such as lifecycle assessment can be used to identify specific environmental impacts, although these are often very expensive when undertaken properly.

Even in free market conditions, in which product differentiation and consumer choice are valued highly, governments encourage people to purchase products with the lowest environmental impact. This is an approach currently being promoted as 'market transformation' (Department of the Environment, Transport and the Regions, 1999). Potential public policy measures include minimum standards for energy consumption in order to exclude inefficient household appliances from the market, ecological tax reform to enable the cost of environmental damage to be paid by those responsible, and improved product information through effective labelling schemes and firm

regulation of 'green claims'. The study by the OECD (1998) concluded that in many industrialized nations such policies are already being introduced.

All this suggests that designers will increasingly find themselves operating in a political climate in which fiscal and regulatory measures, reinforced by increased public awareness, will require new products to have a reduced environmental impact. Throughout Europe, public authorities are developing specific policies to promote products with a reduced environmental impact (Oosterhuis, Rubik and Scholl, 1996), although this trend may appear less evident in Britain than European countries where Green MPs are able to exert more influence upon government.

CONSUMER PSYCHOLOGY AND CULTURE



Products characteristics must change. However, a critical distinction between green consumerism and sustainable consumption is that the latter demands more than the modification, marketing and purchase of particular types of product. A product-centred approach is too limiting to be effective. Evidence suggests that environmental gains from technical improvements in product efficiency have historically been outweighed by an overall increase in consumption (Carley and Spapens, 1998). It is thus not enough for product development managers to take a product, treat it as an isolated entity, and seek to improve it. As Heiskanen and Pantzar (1997, p414) point out, sustainable consumption is 'an issue of consumption patterns as a totality, not buying green shampoo or recycling soda bottles.'

This broader approach is required not just because sustainable consumption implies an increase in eco-efficiency too great to be achieved by technical improvement, but because consumption patterns



are dynamic and depend on lifestyle choices and the changing nature of products. As Pantzar (1995, p105) argues elsewhere: 'products and processes should not be studied (or acted on) in isolation, since individual products and processes are...part of a larger historically changing network of everyday practices and products'. In order to explore further the implications for designers, it is therefore necessary to analyse some of the wider social forces that determine the current level of consumption.

In general, people purchase products in the belief that increased consumption will enhance their sense of wellbeing. Surveys have suggested that this may not be the reality, but it is certainly their expectation (Lansley, 1994). The satisfaction which they derive from this consumption is, however, strongly influenced by other people's consumption patterns. Thus in order to understand how human wellbeing might be maintained while consumption levels are reduced, the psychological and socio-cultural dimensions to consumption need to be understood. This important area of study has received significant attention from psychologists, anthropologists and sociologists and is addressed only briefly here.

An argument often deployed in the growing body of literature on this theme (e.g. Lunt and Livingstone, 1992; Miller, 1995; Corrigan 1997) is that people do not purchase products merely for functional reasons but because of what ownership symbolizes to others, which depends on their psychology and the cultural context. Although hardly new - Veblen coined the term 'conspicuous consumption' almost 100 years ago - it contrasts with the crude assumptions about 'rational' consumer behaviour sometimes made by economists. This more sophisticated approach to the process driving consumption makes product development more complex. Designers need to attend to the 'meaning' or social significance of products as much as functional requirements.

Some designers are already taking such considerations very seriously, an example being the Netherlands-based Eternally Yours network, whose important work on 'product endurance' has focused as much on psychological and socio-cultural influences as design techniques (Eternally Yours, 2000). The network's Congress in 1997 provoked debate on how people relate to their possessions which raised important questions concerning people's attachment to artefacts, or 'user-product bonds' (van Hinte, 1997). Is the creation of a strong bond between users and products the basis for careful, lifelong maintenance of possessions? Alternatively, could such a bond harbour a materialistic desire for fulfilment through the acquisition of more possessions? The 'paradox of materialism' combines an affirmation of material objects with a rejection of excess consumption. Another significant question raised was whether there are limits to the number of products it is possible to cherish, and if it is possible to feel attached to each and every product in one's home.

Increasing this sense of attachment to possessions is important, but if consumption is to be reduced, the pressure to purchase must be overcome. One approach can be derived from Campbell (1992), who has explored the factors that influence demand for new products such as attitudes to the appearance of ageing products and to technological advance. Campbell concludes that there is a distinct sub-group of 'bohemian' consumers who, by demanding new products, make a vital contribution to the dynamic nature of consumer society. Whether or not this particular hypothesis is correct, understanding how to reduce the 'desire for the new' would make it easier to promote 'sufficiency'. One possibility is that there needs to be a revival of traditional, more conservative, cultural values, through which the familiar would be favoured over the new, thus reducing the social pressure to possess new products. This would



represent a formidable challenge, of course, not least to designers and others working in creative professions. Fewer new products implies less need for designers. At the same time, however, such a trend could also lead to greater demand for higher quality products, which could require an increased design input, especially if customized rather than mass produced.

The means through which people obtain the utility or value derived from products is also relevant in discussing the future of consumption. Modern consumerism is based on a culture shaped by the private acquisition of products and this desire to own is deeply rooted (Schrader, 1996). However, there are alternatives to individual ownership that might offer environmental benefits which are now being considered seriously by manufacturers and community groups. These include the prospect of changes in the product-service mix, whereby new services enable products to be utilized more effectively, or reduce the need for products (White, Stoughton and Feng, 1999). Manzini (1996) suggests that this new generation of services will be characterized by low environmental intensity and high user participation. Although they will need a design input, it is likely to differ markedly from traditional product design (Shostack, 1982).

One example is 'eco-leasing.' Several manufacturers of household appliances, faced with the prospect of EU legislation that will make them responsible for discarded items, are considering the possibility of leasing their products. In effect, households would pay for the service supplied by the product rather than the product 'hardware'. This is not dissimilar from traditional rental, although the arrangement would apply over the full lifecycle of the product. The advantage to manufacturers is that they could keep track of their products up to the point of disposal, while the environmental benefit is that this arrangement

could remove their incentive to shorten product life spans as a means of increasing sales (Stahel and Jackson, 1993; Oosterhuis, Rubik and Scholl, 1996).

Another example is the growth in recent years of community-based sharing schemes, which reduce product ownership without necessarily reducing product use. Local Exchange Trading Systems (LETS), in which people exchange a very wide range of products and services using local currencies, have become well established in Britain, with some 350 schemes operating. More specifically, car pooling and ride-sharing schemes are increasingly common in the Netherlands, Germany and other parts of Europe, enabling people to be mobile without necessarily owning a car (McLaren, Bullock and Yousuf, 1998). Similarly, laundries and laundrettes have in the past enabled many people to receive a service, in this case clean clothes, without owning a washing machine.

THE CHALLENGE



Sustainable consumption involves rethinking how needs are met and products are conceived. It thus has profound implications for design, product development and strategic management. Some preliminary observations on possible trends in marketing and design are summarized in Figure 4. These seek to demonstrate the magnitude of change implied by the new consumption patterns.

Firstly, there is a challenge to production and marketing. As already indicated, sustainable consumption demands radical changes in consumer attitudes and behaviour. In contrast with green consumerism, which involved a minority of shoppers seeking out a rather limited range of premium priced products, it implies a deeper cultural transformation. People in general would seek to reduce their environmental impact, not just a small minority, and all products placed

Marketing challenges	<p>the 'integrity gap' between environmental attitudes and behaviour narrows</p> <p>higher expectations that products will have a low environmental impact, especially among the young</p> <p>fewer consumers demand new or innovative products</p> <p>consumers become more responsive to marketing by function than image or association</p> <p>increased demand for longer-lasting, repairable and upgradable products</p>
Rethinking design	<p>trend away from marketing-led design towards 'design for society' design which takes environmental impacts into account becomes the norm, not the exception</p> <p>lateral thinking in design is valued over traditional approaches</p> <p>products are redesigned only when change beyond cosmetic appearance is needed</p> <p>continual, long-term reductions in environmental impact are expected</p> <p>design that evokes long-term use and allows products to 'age with dignity' is favoured</p>

Figure 4. Marketing and design – future possibilities.

on the market would be evaluated by environmental criteria, not just a few.

If it is accepted that prevailing consumption patterns are unsustainable, present consumer demand no longer legitimizes future supply. Thus whereas in the past manufacturers may have aimed to saturate a market with products, a more sophisticated strategy is now required. Crucially, they need to determine how to remain profitable while supplying fewer new products to the market.

They would also need to be responsive to changes in consumer behaviour. In the past, people's behaviour has often not been consistent with their expressions of environmental concern, but this may change. Increasingly consumers may become more reflective and discerning (Hansen and Schrader, 1997). Young people, more knowledgeable about environmental threats than earlier generations, may have higher expectations. More generally, consumers may become more concerned about functional quality, expecting high standards of durability, repairability and upgradability, and less concerned with superficial features and fashion elements intended to enhance a

product's 'image'. They may also demand higher quality information on the environmental impact of products. The prospect of such behavioural change might appear distant, but managers responsible for product development should be aware of the potential implications.

Designers have an important role in creating sustainable alternatives to modern consumerism and this will require a fundamental shift in how they approach their work (Walker and Nielsen, 1998). In advocating 'design for society' rather than design which is led by marketing interests, Whiteley (1993, p3) is persuasive in arguing that 'designers can no longer take refuge from responsibility for their own actions and continually repackage the same old type of consumer goods at a time when issues about consuming and its relationship to the world's resources and energy need urgently to be acted upon.' Kusz (1993, p56) concludes that 'designers are change agents uniquely able to envisage innovative solutions, a critical ability in addressing the environmental crisis' and suggests that they should regard themselves as 'environmental stewards.' Sustainable consumption requires that designers aim to reduce environmental impacts as the norm rather than the exception.

It has been suggested that minor, incremental change to products may not suffice. Designers need to use lateral thinking in order to explore and experiment with new ways to meet human needs, not merely starting from current product designs and adapting existing 'solutions'. This may lead to future work involving the design of service-based solutions as much as the creation of new products. Research on mobility services (Meijkamp, 1997) and laundering services (van den Hoed, 1997) has demonstrated the role of designers in such a trend.

Although consumers will always favour products with aesthetic appeal, they may increasingly choose products



according to functional quality and look for classic style which will not quickly appear dated. This suggests that designers will less often be working on minor modifications to meet the requirements of a new 'season', as redesign will only be required in response to technological advance or other critical factors such as changes in energy or raw material prices. At the same time, as long as environmental problems persist there will be a need to find design solutions that reduce the environmental impact of products. Finally, if products are required to last longer, designers will have to ensure that they 'age with dignity' through the use of appropriate styles and materials which age well (van Hinte, 1997).

CONCLUSION



This paper has explored the profound implications of sustainable consumption for product development and design. Environmental constraints demand new patterns of consumption and it was demonstrated that there is a large body of opinion which has concluded that substantial change is required, although improved data to quantify the exact scale of change would strengthen this argument. An important distinction was drawn between green consumerism and sustainable consumption, from which it was argued that there needs to be a progression from purchasing different types of products to consuming fewer products. It was also suggested that sustainable consumption requires giving attention to the environmental impact of all products rather than a limited range.

The paper pointed out that in many European countries political pressure to include environmental criteria in product development is growing. It then proceeded to the core argument that the growing importance of sustainable consumption in political and industrial discourse requires

designers to review how they see their role in relation to environmental concerns. It concluded that sustainable consumption will involve changes in design priorities, less demand for new products, and new ways of obtaining the utility and value derived from products.

Much is already known and documented about what people consume. A reasonable amount is understood about how people consume. The present need is to know more about why we consume. The implications of sustainable consumption go far beyond those of 'environmentally responsible' new product development. Product development for sustainable consumption requires designers to re-evaluate how they use their skills in order that innovative solutions are found to the problems created by contemporary consumerism.

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