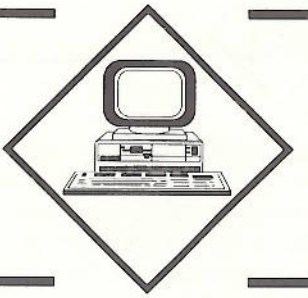
THE DURABILITY OF CONSUMER DURABLES



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The life span of a product is a key component in assessing its environmental impact. Until very recently, however, product durability was far from prominent in the environmental debate. This has begun to change due to mounting concern about waste, the prospect of producer 'take back' schemes and the importance of quality in highly competitive international markets. This has led to product durability emerging on the business and environment agenda.

This paper explores the significance of product life spans and identifies currently available data on the life-span of consumer durables. It defines product life and argues that, from an environmental perspective, optimum product life, rather than maximum product life should be the goal.

It suggests that potential advantages to businesses of manufacturing and retailing products with longer life spans include improved environmental foresight (i.e. a greater responsiveness to new social trends, changes in consumer behaviour and tighter government regulations), an enhanced reputation for quality, greater potential market share and increased customer loyalty.

Addressing claims that manufacturers deliberately make products with the intention that they should have life spans below the known technical potential, the paper identifies some of the influences upon manufacturers which encourage shorter product life spans. Finally, some means by which longer life products might be encouraged are proposed.

INTRODUCTION

Claims that many consumer durables do not last as long as in the past have been made throughout the post war era. Manufacturers stand accused of making products with the deliberate intention that they should have life spans below the known technical potential, designing them in such a way as to make disassembly and repair work difficult, and not stocking spare parts for long enough periods (Packard, 1961; Papanek, 1985; Giarini and Stahel, 1989).

There are, of course, more reasonable explanations for obsolescence. Products may wear out simply because materials have inherent limitations and so cannot be expected to last infinitely. Technological advance has improved many products, and sometimes made them safer. Few people would today wish to buy a cooker without a thermostat, or a black and white TV, or a washing machine without a timing mechanism.

The claims are often based on anecdotal evidence. There has been little authoritative research to substantiate them except for an important (if uninfluential) report by the Organisation for Economic Co-operation and Development, *Product Durability and Product-Life Extension* (OECD, 1982).

Interest in durability has recently been revived, however, prompted in part by a controversial article in *The Ecologist* which argued that recycling was offering large companies '...a convenient environmental excuse for planned obsolescence' (Fairlie, 1992).

This paper discusses the issues raised by product durability and considers the available data. It argues that business strategists need to address durability in the context of environmental management and product quality. Their dilemma is to decide if durability could enter the criteria used by green consumers and become part of the marketing managers' armoury, or whether commercial pressures dictate that company survival will depend on products being regularly replaced.

THE SIGNIFICANCE OF PRODUCT LIFE

According to a growing body of opinion, the business community must eventually face the need for the consumption of materials to be substantially reduced. For example, a recent workshop of the Business Council for Sustainable Development concluded that in the industrialised world 'reductions in material throughput, energy use and environmental degradation of over 90% will be required by 2040 to meet the needs of a growing world population fairly within the planet's ecological means' (Robins, 1993).

The need for considerable reductions in energy consumption in order to prevent worsening global warming is already widely discussed. The Intergovernmental Panel on Climate Change concluded that greenhouse gas emissions must be cut by over 60% worldwide if carbon dioxide levels are not to increase. On the basis of commitment to

international equity, Anderson has argued that energy consumption in the industrialised world needs to be cut by 80-90% (Anderson, 1993). The current EC target modestly proposes stabilisation of emissions at 1990 levels by 2000.

The call for reductions in the throughput of materials is more controversial. Concern expressed during the 1970s that supplies of metals and minerals were rapidly being depleted has eased, but warnings that excessive consumption could leave supplies of key resources 'perilously low' have recently been voiced again by respected scientists. It has been argued in *Scientific American* that at current rates of consumption global reserves of copper, for example, will only last another 41 years (Frosch and Gallopoulos, 1989).

Professor Schmidt-Bleek of the Wuppertal Institute has argued that the sum of man-induced material flows from the 'eco-sphere' to the 'techno-sphere' is a good proxy for the amount of damage done to the natural environment (Schmidt-Bleek, 1993). A similar understanding appeared in the writings of E.F. Schumacher, who warned that industrial countries were misguidedly treating the 'natural capital' of the planet as if expendable (Schumacher, 1974).

Thus worsening levels of pollution may be closely associated with increased consumption of energy and raw materials, although the advent of clean technology weakens the link. Not all technological developments which stimulate growth are in this direction, however; an increasing use of electronics in consumer durables, for example, has meant that the semi-conductor industry is now responsible for some 65,000 tonnes of hazardous waste each year.

The substantial volume of waste created when consumer durables are discarded raises additional environmental concern. In many industrial countries landfill sites are increasingly hard to find, and countries such as Germany propose to place the responsibility for disposing of used vehicles and electronic products on manufacturers or retailers through controversial 'take back' legislation.

As businesses are required to pay ever closer attention to the overall environmental impact of products, from 'cradle to grave', they will inevitably have to consider the duration for which their products are in use. Life cycle assessment is emerging as an important new methodology, although as yet unrefined, and played an important part in the process by which the first EC ecolabels were awarded.

It is not only the environmental agenda that might prompt business strategists to consider the life span of their products. Another factor which they might consider is the potential effect on their markets of changing consumer attitudes to product life. Consumer durables - which are, by definition, intended to be long lasting and resistant to wear and tear - give rise to disappointment if they fail prematurely. As incomes increase, so will demands for higher quality products, and durability and repairability are key aspects of quality (Davis, 1991). This suggests that there may be untapped commercial opportunities for businesses willing to develop more durable products.

However, surprising little research has been published on product durability. Some manufacturers carry out their own product testing, but the last major independent report was that of the OECD and, apart from the New Economics Foundation's research programme, the only other independent work being undertaken is by the Geneva-based Product-Life Institute.

DATA ON DURABLES

The market for consumer durables in Britain amounts to just over £30bn annually, some £130 per household per month. This is less than is spent on food (£44bn), but somewhat more than is spent on clothing and footwear (£21bn).

Just under a third is accounted for by white goods, such as cooking and cleaning appliances, and leisure goods such as televisions, hi-fi and cameras. A fifth is spent on furniture and floor coverings, while around a half is accounted for by cars (Annual Abstract of Statistics, 1993). A typical feature of most markets for consumer durables in Britain is the relatively small share held by domestic manufacturers and the dominance of a few multinational producers.

Defining product life is not a simple task. The theoretical 'technical life' may be much longer than 'actual life in use', as products may function but be outdated or no longer needed, or may fail and demand repair work which is considered too costly, risky, or inconvenient. Actual life in use may be less than the 'economic life'. The latter takes account of items discarded which still function or are economic to repair. An investigation by journalist Tim Hunkin into discarded appliances at civic amenity sites found a quarter still functioning and a further quarter needing only minor repairs (Hunkin, 1988).

A further definition is the 'replacement life', the period of ownership by the initial purchaser. Secondary markets may have a major role. According to one manufacturer, the average washing machine lasts eight years with the first owner, but is used for a further six years by subsequent owners (UK Ecolabelling Board, 1993).

Life times are not easily estimated for many reasons. Product testing prior to use is costly and not always entirely reliable. Aggregated figures are only of limited value, because for each type of product there may be a large range of models which differ in quality.

Once products are sold and in use, the human factor provides scope for variation. For example, a family with babies and young children in terry nappies will give a washing machine something of a battering compared with, say, a bachelor living alone. Likewise the durability of a car will be affected by the distance and care with which it has been driven, whether or not it has been kept in a garage, and how well it has been maintained.

There is very little published information on how long products last, although estimates appear in two recent reports on recycling from the Government's Warren Spring Laboratory (itself suffering planned obsolescence and due to be prematurely discarded)(see Table 1).

In addition to these figures, the life span of cars has been estimated at 10 years and a Government report quotes 6 years for vacuum cleaners and 12-14 years for refrigerators (Groenewegen and den Hond, 1993; Department of Energy, 1990). All figures must be treated with caution. Objective evidence is important. In contrast to the figure cited in Table 1, where one manufacturer has claimed that washing machines last 14 years (UK Ecolabelling Board, 1993).

Table 1: Estimated Product Life-Times	
Cookers:	10-15 years
Microwaves:	8-10 years
Radio cassette players:	10 years
Refrigerators:	10-12 years
Telephones:	3 years
Televisions:	10 years
Washing machines:	7-10 years
Sources: Poll (1993); Sarson, (1992)	

Was there really some glorious past era when consumer durables such as cars, cookers, cameras and carpets lasted for twenty five years or more, as critics of 'planned obsolescence' sometimes imply? Any attempt to identify historical trends is thwarted by the lack of comparable data for earlier eras. Even where such data is available the picture is complicated by the fact that modern items are often constructed differently or have additional functions. Blanket statements about products lasting longer or shorter than in the past would therefore be misleading.

The life span of some has increased. Long-life light bulbs and batteries are obvious examples. Televisions, too, appear to be lasting longer because of improved tube technology and the fact that modular design makes them relatively easy to repair (OECD, 1982).

On the other hand, there is evidence that the life expectancy of other products has fallen. A Government report has suggested that kettles, irons and vacuum cleaners are less durable than in the past (Department of Energy, 1990). Independent market analysts Euromonitor have identified a 'preoccupation with shortening product life' in the market for cooking appliances, noting the manufacturers' dependence on replacement sales (Euromonitor, Market Research GB, April 1992). The durability of cars, too, appears to have been in decline, although a trough may have been reached with the advent of improved rust prevention techniques to compensate for the use of thin-gauged steel (OECD, 1982; Groenewegen and den Hond, 1993).

It would be wrong, however, to focus the debate on product durability around historical trends. Whether or not products last as long as in the past is less relevant than the fact that many could have been made to last longer. The Worldwatch Institute points out that while there has been a steady improvement in the quality of many household appliances, there has been little change in longevity. Modern refrigerators, for example, are cheaper to make, hold more, and use less energy than their predecessors, but do not last any longer. The same is true of many other household appliances (Durning, 1992). This is accepted by manufacturers. According to the OECD report, citing Robert Lund, '...from a technical point of view there is no question that longer-lived appliances could be made. This is freely agreed upon by manufacturers of these products' (OECD, 1982).

OPTIMUM PRODUCT LIFE

Durability is not an end in itself. The environmental target should be optimum durability rather than maximum durability. The production and consumption of goods involves a complex range of environmental impacts relating to raw materials extraction, energy consumption, emissions to air, water and land, and solid waste generation. In seeking the correct life span, all of these impacts need to be taken into consideration. Ideally they need to be weighted so that decisions can be guided by the relative degree of public concern generated by each one, but life cycle assessment has yet to arrive at a satisfactory methodology for weighting environmental impacts prior to aggregation.

For example, the greater the concern about the volume of solid weight generated, the more important it might be to increase product life spans. On the other hand, if concern about the depletion of energy supplies is paramount, it may be deemed more appropriate to encourage new energy efficient products. An example of the kind of trade-off which may have to be contemplated is the use of thicker gauge steel in cars, which could increase life span but, by adversely affecting the power/weight ratio, would reduce the fuel efficiency for any given engine capacity. Studies suggest that increasing the life span of cars could, on balance, significantly reduce materials and energy consumption (OECD, 1982; Davis, 1991).

Where technology has advanced and new models of electrical appliances are much more energy efficient, it is conceivable - though unlikely - that it would be beneficial to replace old products which still function, though this contradicts conventional environmental wisdom (Roome and Hinnells, 1993). Following a life cycle assessment of washing machines, the UK Ecolabelling Board's report concluded: 'The trade off that needs to be made in deciding whether to prolong the life of a machine or to replace it with a new, more efficient, machine is between the production, distribution and disposal impacts avoided per year of additional life of the machine and the reduction in the annual use impacts through greater efficiency' (UK Ecolabelling Board, 1993). The principle established, involving a comparison of environmental impact in manufacture with environmental impact in use, is sound.

Unfortunately the report was weaker in its application, dismissing the environmental impact of raw materials extraction as unquantifiable. Not surprisingly, it then concluded that 'for nearly all environmental impact measures, replacement with a more efficient model would seem to be clearly preferable to increased longevity' (UK Ecolabelling Board, 1993). In theory a washing machine could be very efficient in energy use but designed to last only a few years and still receive an eco-label, which seems far from satisfactory.

Indeed, it would appear from studies published to date as if environmental impact in the use of electrical appliances almost invariably outweighs the impact in manufacture, at least in terms of energy consumption. However, rather than disregarding the environmental impact of manufacturing such products, a case might be made, from a more radical perspective, for questioning the trend towards electrifying

every kind of household product, from lawnmowers to toothbrushes.

Achieving the most efficient use of resources demands attention not only to life span but also intensity of use. For example, the overall consumption of products which are used only infrequently could be reduced if, instead of being purchased by each household, they were shared, rented or leased. This would enable such products to be utilised more efficiently and in such circumstances they could be designed to be more durable. Examples which currently exist include tool hire and washing machines in launderettes.

PRODUCT LIFE AND BUSINESS STRATEGY

What are the implications of product life for business strategy? In a widely cited hierarchy of resource use and waste management options, the order is as follows: reducing consumption and minimising waste, re-use (as with, for example, glass bottles), recycling, incineration (ideally with energy recovery) and finally, landfill.

Under pressure from the Government as well as environmental campaigners, certain sectors of industry have begun to focus on the recyclability of their products. During the course of 1992 the Society of Motor Manufacturers and Traders set up the Automotive Consortium On Recycling and Disposal (ACORD), and the Industry Council for Electronic Equipment Recycling (ICER) was created.

The strategic direction promoted by such bodies is towards recyclability rather than durability. However, the aforementioned hierarchy of options suggests that a strategy of prioritising durability could well be preferable from an environmental perspective, as the throughput of resources would be minimised and fewer products would pass into the waste stream.

Fairlie has voiced a somewhat cynical view of industry's motives: 'Recycling offers business an environmental excuse for instant obsolescence...When a product comes to the end of its useful life obviously it makes sense to reuse the materials. But this does not mean that industry should be allowed to use it as a justification for shorter and shorter life cycles' (Fairlie, 1992).

Whether or not Fairlie has any justification for suspecting a calculated strategy of planned obsolescence, there is a degree of uncertainty about the environmental benefits of recycling (Ogilvie, 1992). This has been further fuelled by negative reports of Germany's recent packaging legislation, uncertainty about the long term commercial feasibility of large scale plastics recycling, and suggestions that the rather uncritical support hitherto given to recycling by environmental campaigners is coming to an end (Irvine, 1992).

It is thus questionable whether businesses seeking to appeal to the green consumer should focus on recyclability. The green consumer agenda has so far included reduced packaging, energy efficiency and recycling, but interest in the life span of consumer durables is emerging. The increasingly sophisticated consumer may look not for the latest colours, or matching knobs and handles - nor even recycled materials - but for products that last.

According to a recent report of the CBI's National Manufacturing Council, markets for environment-friendly products have yet to be fully developed: '...for companies, it is clear that environmental excellence must be seen as a source of potential competitive advantage...The market for environmental products and processes is expanding all the time...Consumer pressure will continue to argue for higher standards' (CBI, 1992). In what ways might businesses benefit by manufacturing and retailing products which are designed for increased durability, and what are the drawbacks?

Many businesses still operate within a very short term planning framework. Thus in developing long life products the necessary research might improve their 'environmental foresight', enabling them to prepare for new social attitudes, changes in consumer behaviour and government regulations. It will also make them more likely to benefit from important breakthroughs in environment-friendly technology.

Another advantage is that an association with increased durability would enhance a company's reputation for manufacturing high quality products. They would thus stand to gain increased revenue because more durable products, being associated with higher quality, often attract premium prices. (On the other hand, there may be an argument for rejecting this pricing option, where feasible, so that environment-friendly products become the norm rather than the sole preserve of affluent middle class consumers.) Durability may well prove easier to market than recyclability, as the benefits accrue directly to the purchaser, not just society as a whole (Roome and Hinnells, 1993).

Improved customer loyalty represents a further potential benefit. Whenever a product wears out there is a possibility that a replacement will be bought from a different manufacturer. If the original manufacturer offers a good repair and upgrading service, however, it is more likely to retain the customer's loyalty and such a service will secure this, at least in the short term. For some companies, expanding into service sector markets may offer new opportunities for growth (Giarini and Stahel, 1989).

Given these potential advantages, why is there no evident trend towards increased product life spans? If there are no technological obstacles preventing longer life products from being made, as manufacturers accept, it would appear to be economic and commercial pressures which prevent durable products from reaching the market.

i. Saturated Markets

Manufacturers and retailers of consumer durables increasingly operate in markets which are nearing saturation. Virtually every household in Britain now owns a television, refrigerator and vacuum cleaner, and over 85% own washing machines and telephones. Manufacturers and retailers have thus become increasingly dependent on replacement sales.

For certain products, such as cars and televisions, there is scope for multiple ownership. With the ever-increasing range of channels on cable and satellite, families might want a television in virtually every room to cater for different viewing habits. As only 18% of households have two cars,

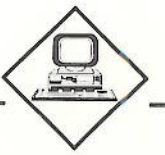


Table 2: Who Owns What?		
	% households	
	1964	1990
Car	37	67
Refrigerator	34	98
Washing machine	53	86
Microwave	0	52
Tumble drier	<1	47
Dishwasher	<1	13
Television	80	98
Telephone	22	87
Video recorder	0	61
Home computer	0	17
CD player	0	21
Sources: Family Spending, 1992; Regional Trends, 1993; Social Trends, 1993.		

there is also plenty of scope for increased vehicle ownership (if not movement on the roads). For other products, technological advance assures future sales, personal computers being an obvious example.

In general, however, where markets are saturated there is strong pressure to design products for shorter life spans in order to sustain sales volumes.

ii. Economies of Scale

Pressure towards reductions in product life is also created by the nature of economic systems, which throughout most of the industrialised world are geared to maximising output.

At a macroeconomic level it is assumed that the more products are in circulation, the higher will be people's level of welfare. At the level of the individual firm continued growth in volume sales is traditionally regarded as essential, exemplified by the maxim 'a company has to grow to survive'.

Manufacturing processes have been developed to serve the needs of mass production, which is seen as the best means of minimising costs and remaining competitive. Such volume-based processes do not always lend themselves to making products which are durable and easy to repair.

iii. Costly Labour

The relative price of labour and raw material inputs, especially energy, is another crucial factor over which manufacturers have little control. One of the key influences upon product life is whether, when products fail, they are repaired or discarded. Repair work may be technically possible but not cost effective because of the high labour cost of service engineers in Britain relative to the cost of manufacturing employees in the Far East. Thus historically, as labour costs have risen and prices of new products have fallen, often in real terms, products have been replaced rather than repaired. Giarini and Stahel call this effect the 'repair cost scissor' (Giarini and Stahel, 1989). Durability has become a victim of free trade.

iv. Cultural Pressures

Manufacturers may also deflect criticism by arguing that they simply make what consumers demand. One reason why consumer durables which have short life spans still find markets is that many consumers evidently get satisfaction from buying and owning new products. Giarini and Stahel argue that 'properly maintained or repaired goods are no longer a sign of good husbandry, but of poverty and second-class status' (Giarini and Stahel, 1989).

v. Risk

Finally, breaking away from market norms or changing position within the market can involve considerable risk to a company. The cost of developing new models can run into hundreds of millions of pounds. Innovative design or marketing strategies may thus be regarded as unacceptable risks.

Most companies with a reputation for making products with long life spans are positioned at the luxury end of the market. An example is the Scottish audio equipment manufacturer Linn, which claims that its products are built with the capacity to be upgraded over decades to state of the art technology. Such companies tend to offer durability at a premium price as a market positioning strategy rather than an environmental strategy, although some are beginning to appreciate that durability is also an environmental concern.

Even among companies which specialise in high quality products precise claims about anticipated life spans are rare. A rare example is the Finnish white goods firm ASKO, which states explicitly in its promotional material that its washing machines will last 15 years (and offers a unique 5 year parts and labour guarantee on its products at no extra cost). German manufacturers Miele, too, have indicated a commitment to making products with increased life spans, as has Philips (WARMER Bulletin, November 1993; ENDS Report, September 1993). Meanwhile, another German company, Braun, has already established a reputation for commitment to durability through its influential head of design, Dieter Rams, who has said publicly that 'one of the main challenges for industrial designers is to create products with longer life-cycles' (Financial Times, 31st July 1991).

MEASURES TO ENCOURAGE LONGER LIFE SPANS

This paper concludes by summarising some preliminary means by which longer life spans might be encouraged. The options include voluntary measures, government regulations and economic instruments. It should be emphasised that if the cultural, economic and commercial pressures noted

above are to be overcome much more radical steps would need to be taken.

i. Green Design

The initial design of a product is, of course, crucial. According to the principles of 'green design', products should be designed for longevity, reliability, ease of repair and, ultimately, recycling. Modular construction is usually beneficial, so that mechanical components, electronic controls, the structure and casing can be separately repaired or upgraded. The use of standardised components may make repairs more feasible when parts are needed. Appropriate materials and construction methods are important. Some electrical products can make use of sophisticated technology, such as features that enable faults and deterioration to be identified and transmitted to users, and controls which prevent abuse of equipment, often a cause of premature failure (Giarini and Stahel, 1989; Burall, 1991).

In contrast, the following description of a typical personal stereo by the Warren Spring Laboratory offers an example of bad practice: 'The case was clipped together, to the extent that it had to be damaged to open it. Additionally the tape head assembly was not fastened in place with screws but with rivets. Both these design features imply that (the manufacturer) does not intend the item to be repaired in the case of failure, but simply replaced' (Sarson, 1992).

ii. Product-Life Extension

Once manufactured and in use, there are various means of extending a product's life span beyond the minimum. Most products are liable at some stage to fail, become technologically out of date, or simply look shoddy. The ease with which repairs and reconditioning can be carried out, and the potential for upgrading (e.g. to insert faster microprocessors) then become crucial.

For products which have not failed but are no longer required by the original owner, the most common means by which product life is extended is through second hand markets, such as the 'goods for sale' columns of local newspapers, jumble sales, car boot sales, charity shops and electrical stores selling reconditioned appliances. Promoting and regulating such markets would be a means of encouraging products to be kept in use for longer.

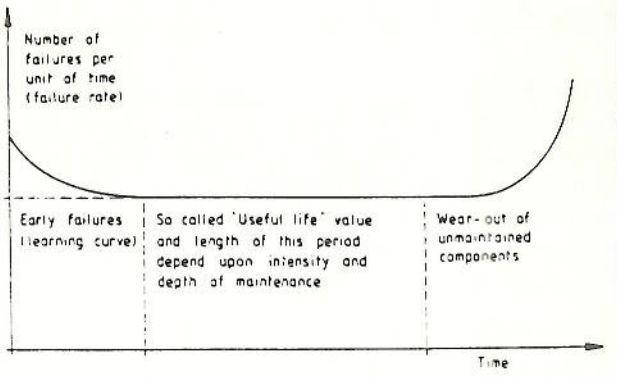
Two specific methods of product-life extension are known as 'cascading' and 'away-grading'. The cascade effect is where the life of a product is extended by utilising successively less intensive ways of using it. For example, structural timber may be reused as planks, then chipboard, and ultimately fuel. An express train may later be used as a goods train, then go on standby duty, and eventually be used for shunting (Giarini and Stahel, 1989). This form of downgrading enables reduced performance to be tolerated.

Away-grading involves sending products to countries where technology is less advanced and expectations lower. While an 8088 personal computer could meet the needs of an administrator in a poor country, a UK-based advertising agency might demand one with a 586 pentium microprocessor; in such circumstances old computers discarded by the latter may be sent overseas.

iii. Manufacturers' Guarantees

One of the key recommendations in the OECD report was for longer guarantees to be offered (OECD, 1982). Products conventionally defined as 'durables' are typically guaranteed for only one year. It might be argued that this does not matter, as most electrical appliances tend not to fail between the second and sixth year: failure tends to be in the first year, or much later in life. It would follow logically that five year parts and labour guarantees could be offered at very little cost to manufacturers. It is fault-free performance beyond this period that reveals whether products have been manufactured to last. A ten year guarantee on electrical appliances could thus have a considerable influence on consumers. However, longer guarantees have in the past been resisted by retailers concerned about replacement sales in certain markets.

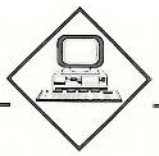
Figure 1: Bath Tub Curve Showing the Relationship of Number of Failures Against Time



NOTE 1. More frequent maintenance lowers the bottom of the curve subject to diminishing returns.
NOTE 2. Taking more components into maintenance prolongs the flat portion
NOTE 3. Scheduled preventive maintenance correctly carried out acts on *components* to reduce average failure rate of the *system*.

Source: BS 5760, Part 0, 1986

The legal position of manufacturers' guarantees is currently being reviewed by the Government. In the past, manufacturers have sometimes paid retailers a token sum for carrying out repairs on products under their guarantee. Such gestures have been made while the legal status of manufacturers' guarantees has been uncertain, whereas retailers' responsibilities for selling goods 'of merchantable quality' are clearly established in the Sale of Goods Act 1979. Significantly, the Department of Trade and Industry has proposed that the Act should include explicit reference to durability within this definition. The effectiveness of this measure would depend on the courts' interpretation of what



a 'reasonable' person considers durable and whether this reform will have a material effect on product quality is thus uncertain. If in future manufacturers rather than retailers assume greater responsibility for complaints, by offering longer guarantees, there might be an impact on quality.

Longer manufacturers' guarantees should not be confused with extended warranties, for which payment is made. The methods used to sell these were made subject to an investigation by the Office of Fair Trading early in 1994. They have been described by the Consumers' Association as a 'waste of money' on the evidence of a comparison with likely repair costs over the same period (Which?, September 1992).

iv. Availability of Parts

Products may often be discarded because spare parts are no longer available or are priced so high as to make repair work uneconomic.

Trade associations such as the Association of Manufacturers of Domestic Electrical Appliances (AMDEA) recommend that functional parts for small appliances are stocked for 5-8 years and those for larger appliances, 8-10 years. Non-functional parts, such as pieces of trim, may be kept for less.

Not all manufacturers keep to these rather undemanding guidelines, however, and there is wide variation in the pricing of spare parts by manufacturers and retailers alike.

v. Consumer Information

A survey by the National Consumer Council found that 80% of people consider it essential to have accurate information about reliability and durability before buying a major household good, but that around 40% consider current provision 'fairly poor' or 'very poor' (National Consumer Council, 1989). Manufacturers could provide retailers with better 'point of sale' information for customers, to enable them to buy on the basis of the cost per unit of service (i.e. taking account of the product's likely life span), not simply price or style.

Assuming that a voluntarist approach does not lead to change, one option which has been proposed is for information about product life to be required by law (Ervine, 1984).

vi. Fiscal Incentives

Tax regulations can often have a negative impact on product life. For example tax relief has in the past encouraged businesses to dispose of company cars after only three years, resulting in a sharp depreciation of value in the first few years and encouraging manufacturers to give durability a low priority (Ware, 1982).

Various reforms to taxation and changes in public expenditure could encourage longer product life. Relative factor costs act as a disincentive to repair work. Ecological tax reform, switching taxation from labour to energy, would help to correct this distortion (von Weizsacker and Jesinghaus, 1992). For example, the national insurance contributions currently paid by employers could be abolished and the revenue raised instead through higher energy taxation. Another option would be to zero rate VAT on repair work (Kemball-Cook et al, 1991).

On the expenditure side, it has been suggested that government grants could be provided for research into product-life extension and, specifically, testing procedures (OECD, 1982).

vii. Producer Responsibility

Finally, durability could well be influenced by the impact of product 'take-back' legislation. The proposal in Germany to make retailers accept electronic products which no longer work may eventually be adopted throughout the EC. This might give retailers an incentive to stop stocking products which last an unduly short period and to improve their repair capabilities. However the legislation has already been postponed in Germany and is likely to be strongly resisted elsewhere.

CONCLUSION

There is a strong argument that a culture of obsolescence exists throughout the industrialised world. As Gordon Rattray Taylor once observed, people have progressively adjusted their expectations to impermanence, to change as something which represents the norm. What is needed, instead, is a culture of permanence (Rattray Taylor, 1972; Schumacher, 1974). Consumer durables would in such circumstances be treated as investments. Instead, the advent of such products as 'throwaway' cameras suggests that the boundary between durables and disposables is becoming increasingly blurred.

Giarini and Stahel have argued for a greater focus on the utilization (their 'use value') suggesting that the interests of consumers are best met through products built to last and be repaired, not ones which need to be replaced regularly. Schumacher made a similar point: 'The modern economist is used to measuring the 'standard of living' by the amount of annual consumption, assuming all the time that a man who consumes more is 'better off' than a man who consumes less...This approach (is) excessively irrational: Since consumption is merely a means to human well-being, the aim should be to obtain the maximum of well-being with the minimum of consumption' (Schumacher, 1974; Giarini and Stahel, 1989).

This should not be seen as a threat to business. Rather, the reverse. Forward-thinking businesses have much to gain from exploring potential new market opportunities for products which are manufactured for increased life spans.

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