Green Design: Design for the Future

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Introduction

"One suspects that a good deal of the wind behind the ecological debate may be driving the very same industrial system which is the principle cause of the environmental trouble in the first place. Ecology then would be a marketing lever to boost sales of products that are anything but ecological. The consumer falls straight into the trap, dashing out to purchase 'ozone friendly' refrigerators and cars with catalysers . This is a chimera: for how ever hard design may strive, by definition there can be no such thing as the 'green' industrial product"

(Tumminelli, 1994, p.90).

This study aims to explore

Chapter 1

The emergence of Consumerism

The following section discusses the emergence of materialism and a consumerist society. Many think that consumerism is a post-World War II phenomenon, but even by the turn of the twentieth century the majority of Americans bought from catalogues (Cerny & Seriff, 1996, p.14). Factories produced goods that a hundred years earlier could not have even been conceived.

Companies saw the potential for profitability of disposable items. These items were introduced on the market with representation slogans such as 'use them once and then throw them away'. BIC shavers, pens and lighters are an example of this, while more recently one can find Acuve contact lenses with their trademark slogan: "Wear them a day then throw them away". Disposability and convenience were suggestions for consumers and the potential for a product's reuse was of little concern to the companies involved. These are a combination of factors that managed to increase the growth of this consumerist society and is consequently accumulating the refuse in landfills sites. The successful introduction of the automated assembly line by Henry Ford and his fellow industrialist Americans, introduced the concept that the 'flow of goods would be affordable and endless'. In addition the technological innovations of mass production, the development of synthetics, alloys and plastics had a basic impact on the generation of consumer goods and altered the way goods were packaged and marketed. Big businesses also invented the concept of "planned obsolescence", which was widely accepted by industry and consumers. This meant that so called durable goods, purposely designed to be cheap to buy 'but difficult or

too expensive to repair once broken quickly' wound up the landfills, along with all the disposable packaging that led to an even shorter useful life (Lears, 1994, p. 35).

By the mid-century advertising helped to ensure that fashion, with its endless range of objects of desire, influenced consumers. Society became accustomed to the enticing campaigns and seductive packaging that managed remarkably to separate us from our money.

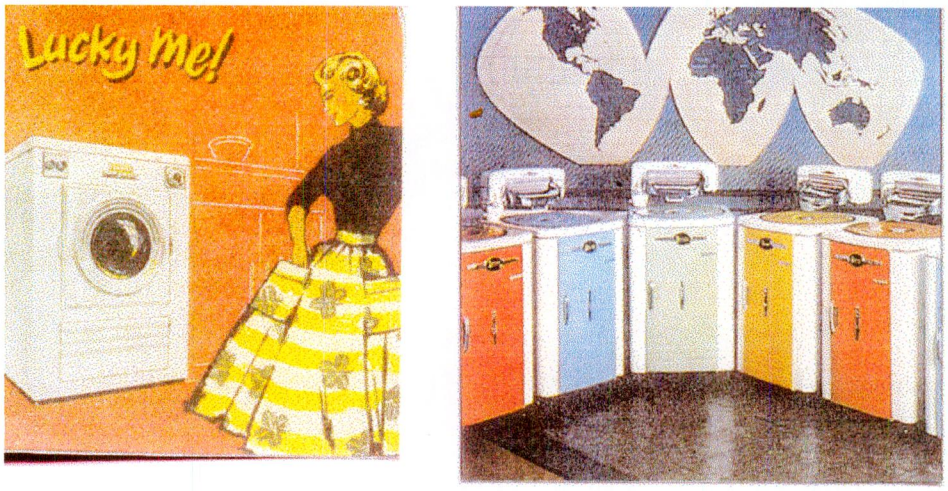
50s & 60s consumerism

This section discusses mass production in the 50s and 60s which resulted in the extension of product ranges and had more influence on the consumer.

The mass production of consumer goods was at its peek throughout the 1960s. More cost efficient means of production and improved technology meant that the retail trade was able to meet the needs of the consumer demands.

As a result an extensive range of products were available to more people. These technology developments consequently changed the attitudes and values of the consumers. According to Powell & Peel, the purchase of a particular brand reflected directly on the consumer, how they were prepared to pay or how much they could afford (Powell & Peel, 1988, p.88).

The kitchen 'the heart of the house' became the key to the ideal home (Powell & Peel, 1988, p. 34). White goods such as food blenders and washing machines were marketed as labour saving devices and made the kitchen more comfortable and more of a family room. In the 1950s people had the mentality, that more time should be spent with the family. Magazines at the time represented 'labour saving devices' as the symbol of the idealistic kitchen where "a press of a button could activate the washing machine" (Powell & Peel, 1988, p.34).



Washing Machines advertised as necessities.
(Source: Powell, Polly, 1988, p. 35) .

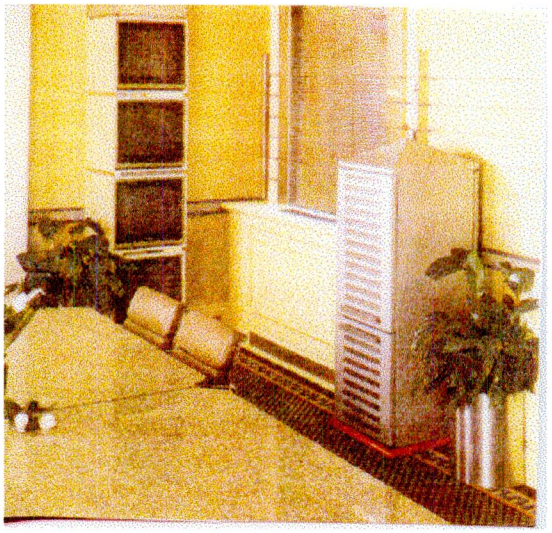
By the end of the 1950s, television influenced people. The retail trade offered a range of colours and different materials in household appliances. This became an important means of representing consumers tastes of fashion and styles. Advertisements presented a vast range of domestic appliances, which had been perceived as luxury items. These were exploited and marketed as necessities.

Stylistic appliances became the norm. The acceleration of mass production of white goods meant that marketing had intensified and became competitive. Companies such as Zanussi in Italy used a competitive strategy by creating more sophisticated appliances. They added character and personalised their product range by introducing colour to add vitality to differentiate their products from the otherwise bland 'white boxes'. Design became the most important means of marketing a product.

The 1950s brought about the vision of consumer choice and production increased. Between 1959 and 1963 fridge production increased four-fold. Washing machine

production increased three and a half-fold. Italy became the most cosmopolitan and unique white goods manufacturer, making its products more modernised and aesthetically appealing. Consumer led design has resulted from the increasing number of updated or revamped styles, thus becoming a status object. Each product had its own identity, which was expressed through styling and the social status of people's lifestyle could be measured by what the consumer owned. An increase in the consumerist society meant that there was a differentiation in marketing target and consumer choices. Styled version stimulated the demand of new products being fashionable. Consequently America has developed into the worlds most developed consumerist society.

The post modernist refrigerator 'Wizard', complete with flag in top, appeared to be much more than a 'white cube', as well as being a functional appliance it is an additional piece of furniture. Zanussi undertook an intense marketing campaign, identifying and targeting specific market segments and categorised their products into ranges, A, B and C (Sparke, 1988,p.211).



Zanussi's 'Wizard' Fridge
(Source: Sparke, 1988, p. 212)

In the 1960s, more products were designed with particular attention to the end user. The extensive research into ergonomics in the 1950s increased consumer choice. Innovative products with new approaches were introduced. Styling has became an important factor in consumer choice. It gave the product 'added value', making it more visually appealing, thus adding a competitive edge. In the 1960s consumers tastes were well addressed. This urged people to buy and gave them the concept of ideology.

The Emergence of The Green Consumer

By the end of the 1960s the colour television, the most important form of culture entertainment, succeeded in the development of a social conscience society. Guilt and self-analysis became a popular way to justify the starvation in the third world countries. In the second half of the decade hippy culture materialised. They were concerned with the 'spend, spend, spend' society, and expressed their concern by living in 'self sufficient' shelters (Powell & Peel, 1988, p. 8).

Concerns of the environment are not just recent. Victor Papanek argued thirty years ago that designers are in the position to help create a better world. "In this age of mass production when everything must be planned and designed, design has become the most powerful tool with which man shapes his tool and environments (and by extension, society and himself). This demands high social and moral responsibility from the designer." (Papanek, 1970, cited by Mackenzie, 1997, p.8).

He believes designers have the responsibility to resist built in obsolescence and they must concentrate on consumers needs rather than wants. Factors that effect the environment cannot be ignored any longer. The government is attempting to enforce legislation's which are concerned with the environment.

Vance Packard also introduced a series of books. The hidden Persuader (1957), The Status Seekers (1959) and The Waste Makers (1960). He argued that advertising techniques are used to manipulate gullible consumers.

Chapter 2

The Beginning of Green design

The ecological movement started in the late 1960s. Rachel Carson's book 'Silent Spring' established an awareness of environmental issues. It was first published in the United States in 1962 and in Europe a year later. It was so popular that it was reprinted six tomes between 1965 and 1972. The book revealed the effect on the human environment by pesticides, fungicides and herbicides and warned of their effect on the planets eco-system. Following that the public began to criticise the design sector, holding architects and town planners responsible for the high rise 'Concrete Jungles'. As a result, urban planners and designers were encouraged to change their viewpoint from quantification to the quality of life in the 'post industrial society', to carefully acknowledge their professional actions that contribute to the throw-away society they were helping to create (Whitely, 1993, p. 48).

In 1972 public concern reached its peak, following the conference on the human environment at Stockholm. The conference was published world-wide, edited by Barbara Ward and René Dubos, known as 'Only one earth', it analysed the problem of high technology. It featured the condition of the earth, pollution, use and abuse of land and the balance of resources (Whitely, 1993, p. 49).

The oil crisis of 1973 emphasised the relation between natural resources, politics and social systems. The rise in petrol prices and fears of rationing, gave the public an insight into what they would experience if global oil supplies became exhausted.

The increasing awareness of destroying the environment has led to the development of a conservation movement in many countries around the world. Conservation

groups were formed in the UK. The environmental movement was supported by groups and organisations such as Friends of the Earth, founded in the USA in 1969.

O2 is an example of an ecologically aware group who are committed to conservation and ecology. The organisation O2 based in the Nederlands aims at encouraging environmentally related design or ecological design. It is a non-profit organisation which enables the interaction of designers knowledge about environmentally conscious design. The organisation was established in January 1993 and was founded by Iris de Kajsen and Marieke Sonnaeld. O2 also have founded organisations internationally, in Denmark, France, Italy, Austria and England. The members are a network of designers, environmental experts, researchers and advisers, who meet ten times a year and analyse factual and concrete prospects for environmentally orientated design. For example design for recycling, methods for making environmental assessments and case studies. The members also discuss conceptual outlooks of ecological design, such as 'sustainable lifestyles', and observe less environmentally damaging ways of living in the future (Geurse, http://cyan.media.wmin.ac.uk/jermg/about_jq.html).

They organise designer discussions about the latest responsibilities of designers and design consultants and the significance of increasing the attention for ecological design. According to O2 "the sooner one recognises the environmental aspects of products, the bigger the influence in the design process it has" (Geurse, http://cyan.media.wmin.ac.uk/jermg/about_jq.html). They influence their clients with the aids of conferences and lectures, excursions and workshops, in order to learn

about the prospects of an environmentally conscious product development. Architects, landscape architects, individual designers and many other professions involved in ecology, anticipate that no one wants to live in a future dominantly 'suffering from a decrease of luxury' (Geurse, http://cyan.media.wmin .ac.uk/jermg/about_jq.html).

Their objective is to achieve both an attractive and sustainable future which will enable wo/mankind to choose his or her own status symbols, wearing his or her own fashion in an environmentally friendly way. To achieve a 'sustainable lifestyle' changes have to be made from a technical angle (as in materials, design for dis-assembly, etc.) and also a change in societies mentality. (Geurse, http://cyan.me dia.wmin.ac.uk/jermg/about_jq.html) O2 aim to influence and modify the practices of industry, thus minimising the destructive impact of wo/mankind's activities. This is both a philosophical and a noble venture in trying to find solutions for a better environment. They believe that ecological design is one of the great challenges of the future. It is also the only opportunity to create a universally improved and sustainable quality of life (Geurse, http://cyan.media. wmin.ac.uk/jermg/about_jq.html).

The Global Crisis

A major difficulty in managing the environment successfully is ignorance. The idea that the earth is so large and its resources so vast that wo/mankind can continue increasing in numbers, use up natural resources and continue to put our waste in empty spaces without significantly altering the environment. The earth can no longer afford the continuation of mistakes such as these. Environmental issues have been the heart of the political agenda for the 1990s, because of the global warming caused by the accumulation of green house gases in the atmosphere. The discovery of the hole in the ozone layer above the Antarctic and more recently, the Arctic, the role of CFC aerosol emissions in ozone destruction, have demonstrated that ordinary consumers are often the cause of environmental destruction.

Our generation is probably the first to think seriously about the future of the planet and seek to conserve it for the future generation. In the past, resources were exploited for immediate survival, without considerations of the future. Many realise now that the consumer choices society makes throughout the day have an important effect of the environment both inside and outside the home. As a result, a new type of consumer has emerged: one who demands that products and services don't 'cost the earth, and is prepared to make choices based on what's best for the planet.

Peoples tastes are changing, and tending towards more fresh, and natural products. Consumers have a greater awareness towards an ecologically correct product.

The commercial impact of the new consumer awareness has resulted in the demand that manufacturers provide "environmentally friendly" products. Governments and industries are beginning to take action. At last it is realised that "green" concerns are

not just another fashionable vogue; they are here to stay. We are entering a new age where our society is becoming increasingly accepting of this as part of our daily lives.

The Trend Of Wastefulness

Americans steadfastly generate more trash and rubbish than any other nation. They produce 200 million tons per year, or 19 percent of the entire world's garbage (3.6 pounds each day). Next in line is Japan at a mere 4.4 percent. In addition, 30 percent of our rubbish consists of packaging material alone (Motavalli, 1995, p. 28). In one hour Americans go through two and a half million plastic bottles (Bronstein 1991, p. 13). As a result children are educated to "reduce, recycle, and reuse". Their generation will have no choice but to cope with the wasteful excesses of the older generation (Cerny & Sheriff, 1996, p. 16).

Developments in advanced technology has been largely responsible for the ability to produce more and more goods. But these developments are subsequently meeting our society's continual desire to consume: to produce and possess, to use and display, and then to discard and purchase again. Ones 'needs' are determined by the rapid change of fashion, and personal status is measured not only by our ability to purchase but also by what we think we can throw away. (Bronsten, 1991, p. 13).

Consumerism is a way of life in our culture. Department stores are partly responsible for consumption in the nineteenth century, these have been outdated by the shopping malls, which are a symbol of contemporary life, and portray an endless arrangement of goods sustained by the deceiving images of actual and imagined needs. We have become primarily a society of consumers rather than producers, spending our time,

energy and imagination buying things rather than making them. The use of objects for symbolic rather than practical purposes is just as responsible for the increasing production of goods due to technological advancements in mass production. "In this age living in a disposable, waste-burdened and social culture we recognise ecological necessity to reconsider the manner in which we use and value things and by the way we view ourselves and each other; thus recycling is a social responsibility". (Cerny & Seriff, 1996, p. 18).

As we can see from the past, advertising has become a powerful tool, to manipulate consumers. Many consumable goods in the 1990s give the impressions of a host of hidden truths (Dormer, 1990, p. 172). Their contents are damaging to the environment both in their production and their disposal as well as extensive testing on animals.

Although it can be said that advertising plays an important role in the future, it is an important position to stimulate consumer awareness (Dormer, 1990, pg. 72). This will in turn influence retailers and they will make their demands on suppliers with a growing agreement to conserve and protect the earth. This will influence a new style in design, with genuine environmentally sound products and processes rather than ironic values.

Chapter 3

Company trends

Many businesses are using environmental performance as a key factor for commercial success. Large companies regarded as being the leaders in their field are introducing environmental criteria into their definition of quality. Electrolux, the largest 'white goods' manufacturer is an example of a company which benefit in environmental practices. This company's environmental criteria will be discussed in chapter 5

Many other companies involved have only emerged recently due to the governments legislation's to practice environmental performance. In the future these legislation's will increase and become of major importance in companies. Companies values and attitudes will change and create new challenges of environmental performance. However the pressure of these legislation's have created a market opportunity for these companies to create false impressions, that give it a unique selling feature. Products can be re-vamped and sometimes sold with no environmental benefit to the user.

Major American industries, while they are promoting their domestic recycling campaigns, have deceived domestic regulations on solid waste management by exporting their plastics, metals, and other industrial scraps to less industrialised and environmentally regulated countries around the world (De Certeau, 1984, p.19).

As discussed in chapter 1, there has been an increase in the range of goods and services the last twenty years. As a result the seller has more competition, and rely on

advertising companies to ensure that the product that the company is promoting has an edge over the competition. The response has been to create an image to surround the product or service., thus giving it an opportunity to stand out from the rest. In some cases the competitive market can give advertisers false claims for their goods and services. Near the end of the twentieth century, advertising still continues to grow and influence society. Therefore people have to develop a greater awareness of its power and influence.

For example, US businesses like McDonald's, have incorporated social responsibilities into their business policies and produce eco-friendly printed materials that reflect their concerns for the environment.

This is quite ironic as fast-food culture is probably one of the most non-ecological food systems of all (Engel, ecomarket@ecomarket.nl/pic/ecomail.gif). Mac Green is an international network of restaurants founded by Klaus Holm (an ecological cook in Copenhagen) which is the eco-alternative to Mac Donald's. The company have a policy of using only ecologically produced food and have eliminated the use of disposable non-organic packaging, food is served on natural, edible plates like leaves and pizza (Engel, ecomarket@ecomarket.nl/pic/ecomail.gif)).

Design companies are commissioned to redesign a companies image. Highly publicised oil spills have had a negative impact on the environment, this has contributed to the public's perception of an industry with little regard for natural resources. Chemical industries such as British petroleum and British gas are promoting themselves as world conscious, caring and humane companies. They have

taken measures in correcting their image stressing the corporations commitment to the environment. There is no doubt that there is a huge amount of hypocrisy with companies like these . They are merely pretending to live up to the values they perceive other people expect.

The role of Green companies

As discussed in chapter 2, 'today's society produces wastes and pollutants which are released faster than the earth can absorb them and natural resources are consumed faster than they can be restored' (Pearson, 1989, .p. 4). As a result in this decade there is an awareness of eco-design and a revival of eco-performing materials. These materials avoid the use of rare resources, which are compatible with the environment and are capable of regeneration at the end of their cycle. As manufacturers and consumers become more demanding, designers are in a more complicated situation, where they have wider considerations, which include environment at the top of their list.

Increasing environmental legislation is the Governments objective to encourage development of green products and processes, which in turn will increase efficiency and minimise pollution and waste. Even the Irish government has put green issues on its agenda.

The European ecolabelling scheme highlights environment design targets for an increasing number of domestic products meeting demands for environmentally sensitive products and services. The following is an example of Environmental criteria for a dishwasher:

Dishwashers and the EC Ecolabel

The following criteria are guidelines that dishwashers will have to meet to be accepted for an EC Ecolabel:

- A named list of materials (ranging from steel and glass to nylon, PVC and HDPE) must be permanently labelled for recycling identification if it exceeds 50g.
- A system must exist for the manufacturer or distributor to take back all transit packaging.
- The machine must wash dishes adequately in an IEC 436 performance test.
- Energy consumption not exceeding 0.145kWH per place setting
- Water consumption not exceeding 2 litres per place setting
- An instruction booklet and machine controls that encourage energy/water efficiency in use by, for example, making heated drying an option, with clear guidance as to when it should be used (Burall, 1992, p22).

The Role of the Green Designer

There are four broad areas that the green designer need to consider: (1) Material and manufacturing processes; (2) Energy; (3) Product life; (4) End of life use.

The following are environmental issues which green designers must account for in their work:

- Minimising the use of materials, hence reducing the depletion of resources and cutting pollution and waste.
- Avoiding materials, that are toxic, using materials that are of environmental benefit, such as recycled plastics.
- Minimising energy use is a prime environmental concern. Fossil fuels are the main cause of global warming and much of the other pollution damage. Designers should focus on minimising energy consumed in products.

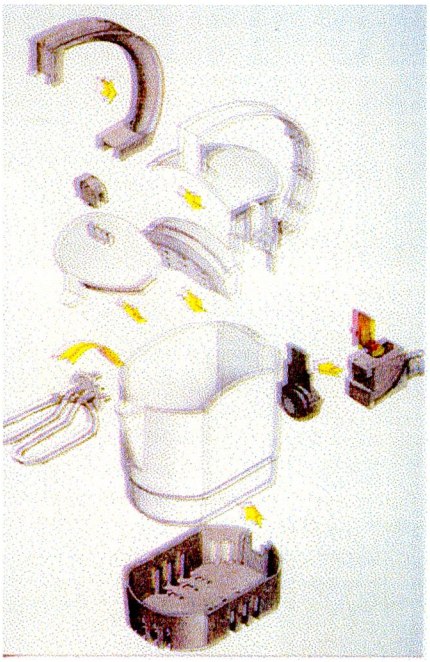
An example of this kind of system is a fridge designed by Van Holstein. This is an unit which cools and heats simultaneously. The fridge uses the most electricity in the household after lighting. This innovative design is the first possibility to save energy and improve existing fridges. The designer chose a fundamental approach to the concept: he discovered a "fridge which forms a chain of energy saving products in the household" (Engel, Marieke, Ecomarkt @ecomarkt. nl/pic/ecomail.gif.). The latent heat from the fridge is used for heating tap-water.

This design which uses absorption refrigeration operates off natural gas, unlike conventional fridges. The average fridge uses 640 kWh/year. This apparatus uses an average 259m3 per year (1936 MJ primary energy). Presently the most energy efficient electric fridges on the market use 300 kWh/year (3060 MJ primary energy). Gas used as an energy source is more than twice as efficient as electricity because of a low output of electricity generators. Although gas-fired absorption fridges already exist, they are expensive to operate and because of the insufficient research done, they are less economic than they could be. The refrigeration unit uses ammonia as a refrigeration coolant, which is consequently CFC-free.

The fridge always supplies heat, even if the user is not at home, whilst heated tap-water is stored. Another advantage is that a fridge produces more heat in the summer than in the winter. It is feasible with a larger production scale, that the price of the unique refrigeration unit can be comparable with a convention fridge of the same size (Engel, Marieke, Ecomarkt@ecomarkt.nl/pic/ecomail.gif.)

Other roles of the green designer:

- Designers also have a role in helping the end user. The explanations of maintenance and repair; instruction manuals should encourage repair. Controls and user manuals should encourage energy efficient operations, while battery powered products should encourage the use of rechargeable batteries.
- Designers should consider the duration of the product, taking into account that a green design is more likely to have a timeless quality rather than be highly fashionable (Burall, 1992, p.23).
- Design for easy disassembly should be used where it is possible, for example the use of reversible fastenings systems (snap-fit, adhesives and welding all inhibit disassembly). Designing assemblies that can be put together from one direction, minimising manufacturing and disassembly time (Burall, 1992, p.23).



Design for disassembly:
'Ukettle', a snap-apart kettle from Fitch-RS
(Source: Burall, 1992, p.23)

Choosing a responsible material

Choosing the most environmentally friendly material is not quite so simple as selecting one labelled "recycled". Environmentally aware designers need to consider the content of the material, the waste generated in the recycling process and the material's likelihood of recyclability or ability to break down in the landfill after it's been manufactured and used. 'Tellus' institute is an non-profit environmental research and consulting group which rates materials with a method of analysis called life-cycle assessments (LCA). LCA determines how these materials impact the quality of the water and air from manufacture to disposal (cradle to grave). Their study found that on a per ton basis, glass has the least environmental impact, followed by paper, steel and recycled aluminium. Plastic and virgin aluminium have the most environmental impact. Plastic is made from petroleum, a non-renewable resource. The manufacture of plastics also generates air and water pollutants. Mining bauxite, which is used in the production of aluminium, produces a corrosive 'red mud' that can pollute surface water and ground water. The production of aluminium consumes the most energy of any other major metals (Evans, 1997, p. 32).

Sustainability

A sustainable development is required to restore and maintain the environment's capacity for recovery. Early in this century, Einstein's theory of relativity presented us with new insights into space, time and causality, and proclaimed that we could not advance any further with our observations in the past. Due to this theory, ecologists hastily began to think conceptually. Old ecological concepts progressed from the study and management of separate parts, separate activities related to our image of a categorised society. "The new perception of ecology is not about separating household refuse for collection, or recycling plastic, or designing modular', 'instead it is everything simultaneously' (Geurse, http://cyan.media.wmin.ac.uk/jermg/about_jq.html.). As a result there is a perspective about a system, where everything is connected with everything else.

The object becomes the key element of this type of system. The object in the future will have to adapt gradually to technical innovations. Due to the re-production of a raw material costing higher than the original productions, consequently it will have a higher ecological price. It is necessary to make the consumption stage as long as possible (Burall, 1992, p. 23). For example a product which is designed for duration, with modular manufacturing, easy dismantling and repair, aesthetic and performance, multi-functionality and flexibility. Which also have the ability of upgrading obsolete components.

The problem is that designers are tackling the wrong approaches. Today's homes are designed without natural light, which is subsequently illuminated by artificial lamps

that generate large amounts of heat and consume large amounts of energy, which in turn is eliminated by expensive air conditioning systems.

Designers produce furniture with ecological materials and processes with respect to the environment, but they are designed in such a way that the consumer is often persuaded to discard them after a certain length of time, thus creating the necessity for a new product and creating new energy consumption (Dormer, 1990, p. 15).

These developments have not helped in the development of a more sustainable environment. If architects are to design houses in such a way that they were illuminated naturally this would reduce the need for artificial light and eliminate the use of air conditioning completely. If designers made durable furniture, this would decrease the problem of the mountains of refuse in landfill sites.

Design culture, ideology, technology, marketing and fashion, are some of the issues that effect the initial intentions of the designer and are the cause of the present day contradictions (Lears, 1994, p. 34).

Many designers assume that their area of responsibility is limited to function and appearance. These approaches are wrong and have significant impact on the environment. Designers must operate from a holistic level. The designer of a product has a direct effect on the environment. Designers have to consider the damage which might occur at each stage. Therefore during the design process s/he must take materials, material processes and product usage and disposal of the item into account in all areas of their work. It could be argued that designers have created a disposable society (as stated in chapter 1), creating numerous different products with styling

which builds up obsolescence. In may cases, ecologists criticise designers because of their failure to use the skills and influence the right environmental intentions.

The possibility of a sustainable society lies in teamwork, so that one can build on its mutual differences. Society must think of the future world, which will become a virtual world where products and services are produced jointly with consumers and workers, such as manufacturers and retailers. The key to this, no longer comes from the past but from the future. Society has learned by looking at the past, that mistakes can be enlightening, thus beneficial (Geurse, http://cyan.media.wmin.ac.uk /jermg/about_jq.html.).

Industrial production has increased fifty-fold in the last fifty years. When production is examined, one million years of the earth's resources are used up each year. A small percentage of the present worlds population take's care of a very large part of the energy consumption.

Since the industrial revolution, the problems with the population boom have become more serious. For example the world population in 1959 was estimated to be about 500 million, whereas in 1986 it increased to 4,750 million. It is estimated that by 2025, the population increase could be ten billion. By the end of the twenty-first century, 40 billion and by 2350 four trillion, four million million (Carlton, 1991, p. 13). Because the estimated population growth could reach 40 billion by the end of the twenty-first century, society has to have sufficient a quantity of food for survival to satisfy the needs of such vast numbers. Therefore, we can no longer have a romantic attitude about ecology, which shuts out technology completely.

Instead of struggling to repair the earth, the priority relies on the self-development and self control of people, organisations, teams and cultures (Geurse, http: /cyan.media.wmin.ac.uk/jermg/about_jq.html.). "Time will not stand still, we have to learn to think in terms of becoming, not being and certainly not in terns of having" (Geurse, http://cyan.media.wmin.ac.uk/jermg/about_jq.html). This means that our society must learn to deal intelligently with destruction, learn to understand the dynamics of nature completely, so that we can take part in the "higher form of co-evolution with our environment. (Geurse, http://cyan.media.wmin.ac.uk /jermg/about_jq.html.).

According to Maslow 'a sustainable development seeks to meet the needs and aspirations of the present without compromising the ability to meet those of the future'. Maslow, the archfather of psychology stated that wo/men have basic fundamental needs. These include food, drink, cloths, and shelter. (Maslow, cited by Groen, http://www.ecomarkt/pic/ecosrch.gif) Maurits Groen questions the definition of our 'needs'. "Does drinkable tap-water suffice or is Coca-Cola, Pepsi or any other brand a requirement for a good life?", "does 'needs' mean wearing Esprit, Calvin Klein, or Hugo Boss?" (Groen, http://www.ecomarkt/pic/ecosrch.gif).

All these questions are significant to ecology, and many similar questions could be added to make a very long list. To sum it up wo/mankind is spending the earth's wealth's as if they were multimillionaires without children.

Joseph Priestly stated that "Whatever was the beginning of this world, the end will be glorious and paradisiacal beyond what our imaginations can now conceive". Joseph Priestly (1799) was reflecting on the early achievements of science and his discovery of oxygen (Priestly, 1799, cited by Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html)..

When Joseph Priestly discovered oxygen, he predicted that nature would be 'more at our command' and that everyone's lives would be 'abundantly more easy and comfortable'. Since the two hundred years Priestly spoke about the positive future, evolution has left no point of the earth untouched. Thus, society cannot continue its present actions, for the present is unsustainable. (Ryan, http://www.wmin.ac.uk /media/jermg/about_jq.html)

Previously designers were in an unclear position in relation to the global crisis and have somehow managed to avoid taking on the responsibility of the chaos they have helped create (Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html). Recently it has become more apparent that designers are now faced with new challenges. They are now obligated to separate the damaging opposition between consumerist culture and nature, and ask themselves 'what impact their work will have on the world' (Domer, 1990, 168). They encourage and express an image of environmentally friendly products which are not tinted with the image of hardship but are expressive of fun, colour, vitality and joy (Ryan, http://www.wmin.ac.uk/media/jermg /about_jq.html)

Design and manufacturing have advanced to such an extent that the world is showered with stereotyped competing images and messages. Manzini says products

are offered and consumed more for what they mean than for what they are. (Manzini, cited by Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html) The meaning and value of an object are important from a consumers point of view because of their cultural qualities rather than efficiency. Manzini calls this a form of 'semiotic pollution', the cultural equivalent of physical pollution (Manzini, cited by Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html).

Chris Ryan discusses a more desirable redesigned virtual world and his virtual environment, which is not idealised but consists of an arrangement of redesigned objects which presently exist. His virtual world comprises a small city where everything from the clothes the inhabitants wear, their homes, office and transportation is redesigned for minimal environmental impact. He focuses on an office environment, where he listens to a virtual powered compact disc to recharge its battery which is recycled by the manufacturer after 2000 hours of use. His virtual computer uses only 30% of the energy of typical computers in use in offices today. The keyboard is made of plastic, recycled from former computer keyboards. His chair 'is designed for easy disassembly, using recycled materials, so that at the end of its first life it may be transformed into another piece of furniture by the same company' (Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html).

From the studies of a virtual world or redesigned environment it is evident that the environment can gain significantly from its aftermath. Friends of the Earth (UK) maintain that if all UK homes were equipped with the most advanced environmentally efficient domestic appliances, there would be a 75% reduction in total domestic energy consumption. The US EPA organisation maintains that if all

computers utilized complied with the same standard of Chris Ryan's virtual world, the annual environment could gain savings of 20 million tonnes of carbon dioxide. In addition, 140,000 tonnes of sulphur dioxide, 75,000 tonnes of nitrogen oxide and more than $2 billion (US) in energy consumption per year could also saved. This gives society a sense of how the present situation could and might be. If we lived in an ideological world where every element of our society is redesigned with 50%-75% less environmentally damaging products, this could make our future more sustainable (Ryan, http://www.wmin.ac.uk/media/jermg/about_jq.html).

CASE STUDY:

ELECTROLUX

BACKGROUND

In 1901 AB lux was established in Stockholm. Axel Wenner-Gren, a marketing genius, played an important role in the group initiating the quest of Electrolux being the largest household appliance producer in the world. In 1912 Mr. Wenner-Gren saw the potential of an inconvenient industrial Santo Vacuum cleaner in Vienna which layed down the foundations of the legendary origins of Electrolux. In 1912 the world's first household vacuum cleaner was launched. Following that, in 1925 the first Electrolux absorption refrigerator was launched.

Electrolux manufactures are based mainly in France, Germany Italy, Sweden and the United Kingdom. The company is unquestionably the largest white goods manufacturer in the world with an extensive 150 factories and 55 million units produced each year. In 1996 sales exceeded SEK five billion. (Electrolux, http://www.electrolux.se/corperate/history/overtheyears.html.)

Over the years the group has acquired many household appliance manufacturers to meet the demand on the European market. AEG, Zanussi, and Hasqvarna are some of the companies that the group has acquired (see appendix 1). Consequently this has broadened their product range, which also includes cookers, chain-saws, lawn mowers, washing machines and medical refrigeration equipment. Over the years subsidiaries were established world wide. To sell their products in the Far East,

subsidiaries were acquired in Hong Kong. Companies were also set up in the USA. However, some of the companies which were taken over were experiencing economic difficulties. Electrolux took advantage of their environmental strategies, thus providing the company with a competitive edge. For example, Frigidaire, the third largest white goods manufacturers in the US, was taken over by Electrolux in 1987. At that time, the company had, according to one of its industrial designers, 'a culture of churning out cheap products' (Burall, 1992, p. 24). The new management transformed Frigidaire into a 'customer-focused culture'. Industrial design became the most important element in this transaction (Burall, 1992, p. 24).

Environmental intentions were built into the design philosophy for two specific reasons: Primarily to exploit the expertise of Electrolux's environmental strategies, which acquire strict government regulations; and to provide Frigidaire with a unique competitive edge.

The price structure of the American market prevented the direct transfer of European green design features because they are too expensive. In fridges, for example advanced insulating materials are too costly. As a result Frigidaire has improved energy efficiency by making the best use of existing insulation materials, utilising better gaskets and seals, and using smaller and multiple doors (Burall, 1992, p. 24).

As discussed in Chapter 2, population growth, famine, third world underdevelopment are some of the problems which torment the planet (Electrolux, 1997, p. 100). The improvement of standards of living in the Western world means that companies turn over more and more resources. As a result environmental problems occur, which

include global effects such as greenhouse warming and ozone depletion, as well as local effects such as noise and air pollution. Many resources are becoming limited. Fresh water supply is limited and forests are disappearing. The only way of solving these issues is through significant environmental alterations (Electrolux, 1997, p. 100).

In the 1980s "ecology" was ruthlessly exploited and dissolved into nothing more than a slogan. Manufacturers of consumer goods took advantage of this, which is ironic since mass consumerism is undoubtedly the main cause for the present state of the earth. Electrolux marketed their products with false impressions of 'wholesomeness' and 'sincerity'. However, some manufacturers such as Electrolux believe they outshine the ecological issue of fashion and commercial opportunity (Electrolux, 1997, p. 100). Manufactures such as Electrolux have taken advantage of leading technological solutions and eco-compatible systems. The group is the leader in the design and communication of domestic appliances that are genuinely green in terms of material, manufacturing, function and recycling (Electrolux, 1997,p.100).

The contribution to protecting planet earth has been one of the Electrolux's marks of distinction. Electrolux is minimising their environmental impact of producing 55-60 million products a year, keeping energy consumption down to a minimum and playing an active part in preserving the environment that surrounds us by using leading edge technological solutions and eco-compatible production systems. (Electrolux Corporate, http//www.electrolux.se/corperate.history.)

According to Michael Treschow, President and CEO of Electrolux.

> *"Environmental protection is a long-term question of survival for individuals, companies and society. Activities must be adapted to nature's own limitations in terms of resource use and pollution. Environmental care must be a cornerstone on our operations and characterise our daily work"*

(Electrolux, http://www.rex.zanussi.it).

Environmental changes - The motive for the Electrolux Strategy

The dramatic environmental changes are affecting society in different ways. The following are three reasons that are the driving forces for the Electrolux environmental strategy:

1. People are becoming more aware of the environment and are changing their behaviour, which includes their behaviour as customers. They demand more efficient and eco-friendly products and they want to do business with companies that represent the highest environmental standards.

2. Resources, materials, energy and water will cost more. Therefore products and companies that are most efficient will have competitive advantages.

3. The number of regulations, legislation and treaties are increasing. In turn society will continuously put new demands on citizens and corporations. (Electrolux, http://www.rex.zanussi.it)

Because of these driving forces Electrolux have made a strategic decision:

Their objective is to lead the development and processes of environmentally sound products and to stimulate the demand for such products.

Based on their strategy Electrolux view the products life cycle, from raw materials selection and manufacturing to product usage and recovery. This total approach is especially important since 80% to 90% of the environmental impact during the life cycles of the companies products usually arise during their usage. Therefore, thinking "environment" is integrated into all processes, at every stage and at all levels within the group.

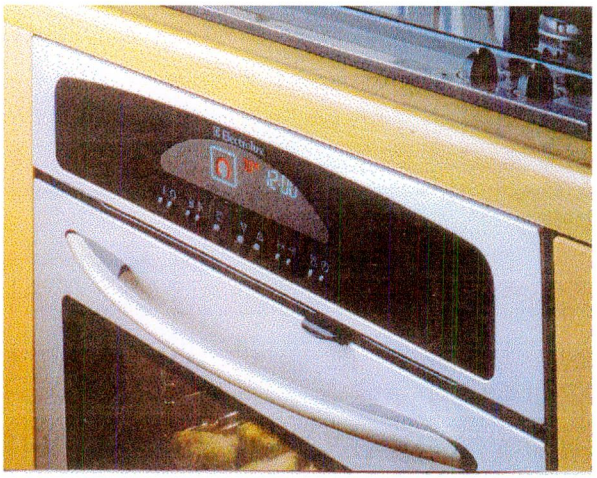
Environmental activities are integrated in the companies business strategies that in turn modify the corporations future developments. Since 1995, under the directorship of Per Grunewald, the company assigned itself to 'environmental affairs'. For the past three years surveys were supervised from an environmental point of view. The companies research reveals that almost 90% of environmental destruction results from electrical appliances, during the course of their use. Three consecutive steps were undertaken to increase the production of innovative eco-friendly products (Tumminelli, 1997,p.70). The first step concerns the improvement of products and existing technologies, with the objective of reducing electricity and water consumption. For instance, the elimination of CFC and HCFC gases was introduced in the 'Green Freeze' refrigerator which was launched in 1993. Advanced technologies were also tested and introduced to existing products. Secondly, in professional kitchens, a sensor measures the distance of the pot or pan from the hob

so that the required electricity is minimised. The third step is the introduction of new innovative products such as the automatic lawn-mower produced by Husqvarna. This product is programmed automatically to transport itself up and down the garden while cutting the grass silently. The mower requires no batteries, but is alternatively powered by solar energy (Tumminelli, 1997,p.71).

Electrolux has committed itself to the strictest certification standards. The Swedish production plant at Alingsös and Italian plant at Vallenoncella have secured certification to BS 7750 and EMAS. Transport systems is an important factor in the companies strategy. Bearing in mind that the group has a colossal distribution of products each year and in order to contribute to the reduction of transport emissions, Electrolux has selected rail transportation. A subsidiary of the company, Nordwaggon AB, distributes 75% of their products to European markets by rail (Tumminelli, 1997,p.71). Electrolux addresses recycling on an economic basis rather than a technical situation. At the end of the product life cycle the product is perceived as being 100% recyclable. The company has a recycling strategy, where the end user is enlightened on their involvement in the development of a sound environment. In Switzerland and Germany fridges are collected from the customer in exchange for their new one. The refrigerators return to the manufacturing plants and the components are disassembled and recycled, and the consumer doesn't have to pay any extras on refuse collection (Tumminelli, 1997,p.72).

With Electrolux's new range the company uses design as a means of product differentiation. The designers have paid particular attention to the form and detail, simplifying the overall appearance, controls and graphics. The following designs represent Electrolux's new generation of energy efficient products:

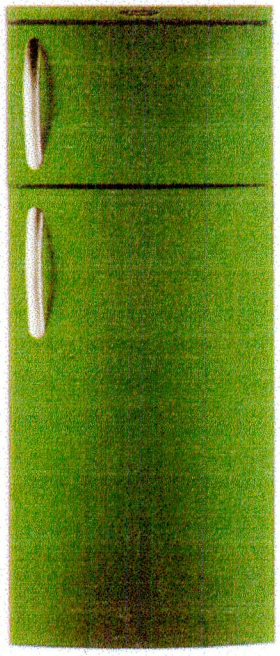
The 'Creation' ecological oven is 60% more efficient than similar products on the market, thereby reducing energy consumption from 0.9 kWh to 0.7 kWh. Twenty percent of oven heat is lost when the door is opened. The window in this model is made from triple-sandwich toughened glass which saves energy in reflecting the heat back into the oven. It also features a large window and a powerful lighting system fitted along the sides which allows cooking to be checked without having to open the door. Other models feature a double releasing door opener, a new safety system, which expels the heat and steam and prevents accidents. Eighty percent of the cooker's materials are recyclable. Almost all the plastic parts are labelled by type to facilitate separation and recycling. The cooker also facilitates multifunctional controls which enables a specific amount of energy to be used to obtain maximum results with minimum wastage (Electrolux, 1997, p. 101).



The 'Creation' ecological cooker
(Source: Electrolux, 1997, p. 101)

The 'Green-Freeze' fridge-freezers utilise an insulation and cooling system with a natural gas (isobutane) which is a refrigeration gas with zero impact on the ozone and green house levels. The refrigerator has a retro appearance, soft, rounded shapes, big easy grip handles and all the paints are ecological. This refrigerator is differentiated from the conventional 'white box' by the use of softer angles. The door has a curved front for visual and structural reasons. This style reduces the thickness of the metal and the bowed front strengthens the door.

The unit is designed to be fully recyclable, easy disassembly, shredding and separation (Electrolux, 1997, 101). The environmental impact of a product is a strong marketing issue in the fridge/freezer sector, since after the light, the fridge uses up the most energy in the household.



The 'Green-freeze fridge-freezer
(Source: Electrolux, 1997, p. 101)

Most of the planet is covered by water. Oceans take up 71 percent of the earth's surface. But all the water supplies are not fit for drinking, cooking, or bathing in. Electrolux's washing machines are more efficient in both water and energy. A sensor calculates water delivery according to the weight of the washing. It is also capable of recycling the same water from the last rinse, up until the next wash is due. This washing machine is capable of consuming no more than 40 litres of water in a wash cycle and uses 20% less energy than other energy efficient washing machines on the market (Tumminelli, 1997,p.72). This model represents the use of computer-aided design and engineering to produce a washing machine with fewer individual parts. It is moulded from an advanced polymer material called Carboran. This material can be recycled and does not rust or require enamelling. It also has excellent sound and

vibration absorption properties. In addition it also allows numerous components to clip together on the assembly line, thus saving a large number of additional fixing items. The overall unit is 80% recyclable. The Carboran plastic can be melted down to form new pellets for second generation machines.

Electrolux washing machine
(Tumminelli, 1997,p.71)

In the 1990s more designers and manufacturers have discovered that money is to be made in relation to environmental issues. Electrolux is a company that believes business and environmental issues can control a more sustainable life thereby providing consumers with safe and environmentally sound products, which in turn is good for the company's business.

Minimising the environmental impact in this perspective is the over-all target for Electrolux in their environmental work. They believe that this is necessary in order to

create value for their customers and shareholders, which in turn restrains the environment from any auxiliary degradation.

Conclusion

Walter R. Stahel, has written extensively about ecological issues. He is one of the founders and co-director of the Institut de la Durée in Geneva, an organisation that studies the life cycle of products and services. Stahel's theory is an economic one: 'every new product put into the market incorporates an energy cost that has to be amortised. Matching the increased duration of goods is a proportional energy budget saving, with an overall economic as well as ecological benefit. The durability strategy becomes the hinge of a possible consumer society in which the trade value is substituted by use-value, that of a services economy. A corollary to this theorem is the anti-economical nature of recycling in its present conception" (Stahel cited by Tumminelli, 1994, p. 90).

For a really sustainable society it is necessary that we take large steps forward. The quality of our existence should be improved by taking the environment into account in everything we do. Because of this consumers and industry will have to change .Creativity and innovation are the possibilities which present themselves in the dynamics of a system like this. Electrolux is an example of a company which contributes to the development of a sustainable life and takes advantage of technologies to create a balanced eco-system.

Foreseeing that no one wants to live in a future 'suffering from a decrease of luxury', a greater emphasis comes to lie on the self-development and self control of people, organisations, teams and cultures. People need to create an eco balance and make the

right decisions concerning everyday life issues, such as what kind of transport to use, or what food to eat in order to retain the quality of our existence. There is no need for sacrifices, as long as we take care that the things we do are being done in a more efficient way.

The German church reformer, Marten Luther, had the right attitude. Hammering his 95 theses on the door of the castle's chapel of Wittenberg, he stated that "Even if tomorrow the world might end, I would still plant an apple tree today".

(Luther, cited by Groen, http://www.ecomarkt/pic/ecosrch.gif)

APPENDIX 1

ELECTROLUX OVER THE YEARS:

1901 AB lux, Stockholm is established. The company launches the Lux Lamp, a Kerosene lamp for outdoor use, which has excellent sales success and is used in lighthouses all over the world.

1912 A partnership begins between Lux and Axel Wenner-Gren. The first vacuum cleaner, Lux 1, is introduced. Axel Wenner-Gren becomes the agent for Lux in Germany, United Kingdom and France.

1915 Axel Wenner-Gren sets up the sales company Svenska Elektron. The method of home demonstration and hire purchase establishes the company and proves a great success. Salesmen arrange demonstrations of the machines on hand-carts through the streets.

1919 Electrolux is formed by merging Electromekaniska and Lux. Axel Wenner-Gren becomes General Manager of the newly formed company. Model V domestic vacuum cleaner is launched with innovative runners for mobility.

1922 Baltzar von Platen and Carl Munters, two Swedish students from the Royal Institute of Technology in Stockholm, invent the first refrigerating device. This machine produces cold through heat, using a new and brilliant application of absorption. The machine can be operated by electricity, gas or kerosene. Production

of the refrigerator begins, based on Platen-Munters's invention. The Company AB Artic are formed.

1925 Electrolux purchase Arctic and launch the first absorption refrigerator, the 'D-Fridge' on to the market.

1927 Electrolux Expands and builds vacuum cleaner plants in Luton, England and Courbevoie in France. They later equip the plant for refrigeration production.

1930 The first built-in refrigerator is launched. These refrigerators are unique in that they are compact and are therefore marketed towards the kitchenette, in the small, modern apartments at the time.

1934 The company creates greater market coverage by producing vacuum cleaners in Connecticut, USA and purchase Volta.

1940 World War II transfixes the production of many of Electrolux's plants and subsidiary companies. The group change course and produce air filters for the Swedish defence force. The manufacture of vacuum cleaners begins in New Zealand and Australia.

1944 Electrolux purchase Bohus Mekaniska Verstads AB in Goteborg, thus producing a new product range - industrial washing machines.

1951 The first household washing machine is introduced.

1956 The group launches the first chest freezer and its first compression driven refrigerator. Caravan refrigerators are exported to the USA.

1959 The first dishwasher designed by Electrolux is a bench-top model "round jar". The company merges with Elektrohelios, they acquire the production of cookers.

1963 The group introduce a new product line of combined fridge/freezers and chest freezers. The vacuum cleaner celebrates its 50th anniversary. The Luxomatic vacuum cleaner is introduced with an additional feature of an adjustable nozzle.

1964 The group has a turnover of more than the billion Kroner mark. The sale of absorption refrigerators rockets. In order to meet the demand, a decision is made to build a cooker and refrigeration plant in Mariestad.

1967 Electrolux purchase Norwegian Elektra (a cooker firm), and Danish Atlas (a refrigerator company). The lawn mower company, Flymo, which has a base in Sweden and England is purchased, as well as 50% of the cleaning company ASAB.

1969 The first USA subsidiary, Domestic Sales Corporation (absorption refrigerators) is set up. A company is also established in Hong Kong, in order to broaden their production market in the Far East. The environment becomes the central debate within the company.

1973 The company gives the white goods a face-lift by introducing trends towards new colours. Caravan refrigerators are increasingly popular in the USA market.

Manufacturers of absorption refrigerators are bought in Germany and Luxembourg (Kreft, and Sieges) to meet the demand in the European market

1974 At this stage it is apparent that the household appliance market in the US is booming, thus vacuum cleaner producer, National Union Electric, (NUE) is acquired (today it is named Eureka company). This deal makes Electrolux the world's number one producer of vacuum cleaners. White goods are marketed under the brand names of Environmental cooker de Luxe, Future line and Superstar Electronic. The group commits itself to nature conservation product, and cleaning of waste water. The ORWAK waste compressor is launched.

1976 The company introduces itself to the French market. Torado, a white goods manufacturer is purchased, including Nester Martin of Belgium and Menalux of Switzerland. The company also strengthen its Swedish household sector by the possession of Husqvarna, which adds the chain-saw to their product range. The white goods company Therma of Switzerland is also acquired.

1984 Electrolux purchase the Italian company Zanussi which was founded in 1916. It also has subsidiaries in Spain. This makes Electrolux without doubt the leader in the European market for household appliances. Thus it's sector of washing machines and tumble dryers is extended. The firm Zanussi in Germany and duo-Therm in the USA are also purchased. These companies are involved in the manufacture of air conditioning products.

1987 The third largest white goods company in the USA, White Consolidated Inc. is acquired which include brands such as Frigidaire, Gibson, Kelvinator and Whitehouse. The goods division is also strengthened by the purchase of the British company Thorn-EMI (Tricity) and Corbero and Domar of Spain.

1991 The Hungarian white goods company Lehel is acquired. The 'Low Energy Refrigerator' is launched, which halves energy consumption for the user. Ten percent of the AEG's household appliances division is bought.

1994 CFC free refrigerators are launched, another 10% of AEG's appliances division is bought. The company have a turnover of 100 billion SEK. The Electrolux group celebrates it's 75th anniversary.

1997 Electrolux are introduced to Brazil by acquiring the white goods manufacture Refripar and produces under Electrolux-Prosdocimo brand name.

(Electrolux http://www.electrolux.se/corperate/history.html.)

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