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A STUDY OF THE BRAND PORTFOLIO AS A BRAND NETWORK

Key-words

Brand portfolio, Brands, Strategic Marketing

Abstract

Our purpose is to contribute to the understanding of brand portfolio management by examining the brand portfolio strategies of a world-leading company. We started to work on a case study with L'Oréal. Our research focused on two questions: (1) What reasons lead L'Oréal to develop a brand portfolio strategy, and, (2) how can brand portfolio management create a higher and stronger level of competitive advantage for this company.

The results show that an aggregation of brands is not in itself a brand portfolio. The juxtaposition of brands is one of, but not the sole, element necessary for the development of a brand portfolio, which is a combination of a brand ensemble and key competences born out of organizational savoir-faire.

By analysing the evolution of the L'Oréal brand portfolio, this work shows how the brand combination within a portfolio is a key factor for the company development, growth and risk management. It is a crucial phase to understand L'Oréal's competitive advantage.

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His research is centred on the links between strategy and marketing and includes brand management, marketing of innovation and intercultural management.

Introduction

Many firms are becoming increasingly concerned by the definition of the relationships between brands within the company as parts of a whole, and with the organisation of these connections within the framework of a brand network. This question of the relationship between several brands within the same company surpasses traditional models of brand management and concentrates on the coexistence of powerful brands whose relations have to be regulated (Carlotti, Coe and Perrey, 2004). Choosing the brand portfolio strategy becomes the focal point for several companies and many authors (Kapferer, 2000; Dawar, 2004; Laforêt and Saunders, 2007) emphasise that managing a brand portfolio is far more important than managing one individual brand. The brand portfolio raises the question of the links between strategy and marketing. Strategic choices may become brand choices, choices of brand organisation or choices about the kind of relationship the company wants between brands (Riezebos, 2003).

Our work tries to shed some factual light on the role of competences in the link between marketing and strategy through a study of a real situation of brand portfolio construction and development. Our research goal is to contribute to the knowledge of the brand portfolio field as a new, more complex and longer-lasting source of competitive advantage.

This article reports on a study of practices at L'Oreal, one of the most recognised brand portfolio managing companies.

FROM A BRAND TO A BRAND PORTFOLIO

Since brands can be viewed as key value-creating resources and useful sources of sustained competitive advantage because they are company-specific, protected by law and inimitable (Barney, 1991; Urde, 1999; Teece, 2000), a key challenge facing contemporary strategic marketers is the ability to manage brand ensembles because the brand portfolio question *"goes beyond issues of marketing*" (Pierce, Moukanas and Wise; 2002).

The combination of brands within a portfolio is a key factor for the development, growth, and risk management for many companies, and is a crucial phase to understand the companies' strategies (Day, 1994; Sharma, 1999; Slater and Olson, 2001). As a consequence, a better understanding of some

companies' policies and practices in regards to their management of multibrand systems can contribute to changing the focus of marketing to a superior, strategic decision-making level (Baldinger, 1990; Brown, 2005; Mattsson et al., 2006).

Several strategic marketing models consider that company resources and competences should be the starting point for analysing competitive advantage (Day, 1994; Hunt and Morgan, 1997; Srivastava et al., 1999). A recent review of empirical literature in management concludes that a company's competitive position depends essentially on its organizing context and on its valuable, rare and inimitable capabilities and core competencies--rather than on its static resources (Newbert, 2007; McGuinness, 2008). Recent developments have substantially clarified the theoretical meaning of organizational capabilities (Helfat and Peteraf, 2003; Salvato, 2003; Winter, 2003; Zahra et al., 2006) and have found persuasive evidence (Newbert, 2007) that it is *capabilities* and their underlying micro-processes ("what firms do"), and not resources ("what firms are"), that determine an organisation's responsiveness, competitive advantage, adaptive change and performance (McGuinness, 2008). In this context, in order to better understand the role of the brand portfolio in the construction of a company's competitive advantage, the researcher undertook a study of the nature and dynamics of brand portfolio-related competences in the context of a cosmetics industry company. The purpose of the research is to identify and examine empirically how this company built its brand portfolio, the way it manages it and to what extent this brand portfolio represents a higher level of competitive advantage that is more difficult to understand and imitate. Our study concentrates on the knowledge of the process implemented in brand portfolio development, and on the analysis of the competences that should be created, utilized, or developed for this implementation.

METHODOLOGY

Because of the novelty of the subject we chose an exploratory approach by means of a case study. The lack of empirical work on the brand portfolio phenomenon was instrumental in the decision to use the case study method as well as the fact that case studies can be particularly useful for understanding marketing phenomena, thus involving an examination of their dynamics and evolution over time (He and Balmer, 2006; O'Driscoll, 2006).

We developed our research in the field of cosmetic products because it is clearly characterized by a strong brand presence and by an extremely developed practice of multibrands policies. Within this product category we studied the world leader, L'Oréal. The L'Oréal Company was selected due to it being one of the most successful within its markets. L'Oréal is a leader due to the size of its sales turnover, its growth and financial results in the world of cosmetic products on a global scale, but also because of the exceptional longevity of its performance. Created in 1907, they currently employ close to 61,000 people worldwide. The company is present on the whole of the activity spectrum in the field of cosmetics with several brands (See appendix A).

Data Collection Procedures

We chose non-directive key-informant interviews (Moorman and Miner, 1998). We called a key informant any person who, because of his/her position, holds privileged and reliable information. Using public information, we selected, contacted and interviewed executives with three different concentrations of responsibility within the company (see Appendix B), in order to collect data in various spheres:

- Strategic level: Vice-President and the highest executives in charge of strategy
- Intermediate level: Brand managers and Marketing managers
- Operational level: Country or Zone Manager

We made use of semi-structured interviews. These interviews use very open questions in order to allow the expert a wide-open space to elaborate his/her own ideas. We obtained, tape-recorded and transcribed fifteen different 60-to-105 minute-long interviews.

Analysis and coding methods

While collecting and analysing our data we coded, summarized, identified the relevant subjects and clustered the data in coded blocks in order to create a cognitive map and achieve qualitative data reduction. We established a synthesis card for the first documents and interviews with a codification matrix. Then, we established a terminology list for preserving some coherence between our research project and the coding matrix. On this first coding level we identified nine key subjects. On a second step, we coded more precisely inside each subject, with 52 codes.

FINDINGS

Analysis of the building process of brand portfolio adoption at L'Oréal

An analysis of interviews shows that the construction of L'Oréal's brand portfolio is above all the outcome of historical evolution based on cumulative experience with certain 'triggering' events serving as catalysts. From the interviews we identified three distinct phases which characterise the construction and development of L'Oréal's brand portfolio. Each phase corresponds to a certain level of training, know-how, and organizational structure. Crucial events in the company's history are identified as the triggering factors for each phase. The evolutionist dimension of brand portfolio construction is spontaneously and systematically evoked; the portfolio is perceived as the resultant of a historical and "biological" process. Informant 2 stated: *"I think it boils down to biology: It's not like some higher power says from the get-go, 'Here is how I will build the world!'"* and Informant 7 observed: *"There is a kind of evolution going along with a few mistakes, tentative steps, external phenomena and, when everything happens, there still are people who can conceptualise, model the thing and then make a variation on it".* Table 1 synthesizes the three different phases of brand portfolio development at L'Oréal.

Table 1: L'Oréal's brand portfolio development phases

	Triggering Factors	**Main Objectives**
Phase 1 1976 – 1984 Aggregation of brands	Further to a McKinsey analysis, creation in ***1976*** of world operational divisions, with different brands that are specific to each distribution network	- To respond to segmentation needs and the limits of existing brands - To be present in all distribution circuits - To give rise to internal emulation
Phase 2 1984 – 1996 Reduction and rationalization of the number of brands	In ***1984*** buyout of Warner Cosmetics: Reflection on how to globalize national brands in a coordinated manner	- To optimise profitability - To choose from amongst brands the ones that can be globalized - To allocate innovations born out of research and development
Phase 3 Competitive Conceptuali-zation	In ***1996*** buyout of the Maybelline and Redken brands. The portfolio becomes an evolving system, which structure the whole company strategy	- To define strategic axes for long-term growth - To organise the brands as a network of complementary brands - To deal with complexity

Key competences for managing L'Oréal's brand portfolio

During the progression represented by these three phases, an internal learning process permitted L'Oréal to acquire or to develop specific competencies. Our research shows that at L'Oréal, the brand portfolio is composed of a group of brands and key competencies built and accumulated through the experience of the company. Specific key competencies for operating an ensemble of brands have been built up in order to make the most of an organized ensemble of brands. This savoir-faire is organized around three key competences presented in Table 2:

Table 2 – Identification of key competences for managing the brand portfolio at L'Oréal

Key Competences	Principal Characteristics
Brands Radicalization	1 / Maximum differentiation for adding targets (distribution, needs, price) 2 / Integration of very original brands (ex: The Body Shop, Shu Uemura)
Brands Network Arbitration	1 / The portfolio is conceived as a dynamic network of complementary brands with critical thresholds (turnover, market share, future profitability) 2 / Brands that can be made available within different divisions of the company (Hair Care, Skincare, Make-up, Hair Color) 3 / Balancing fund between brands
Brands Expansion Matrix	1 / A model for development that is based on three dimensions: Segments of Consumers / product categories / distribution networks 2 / Attribution of innovation 3 / Globalisation and capture of new markets

Brands Radicalization

This term is utilized by the company to qualify the ensemble of actions that lead to re-centring each brand on its savoir-faire, added value and internal coherence: history, character traits, values, distinctive positioning. Brand multiplication makes it necessary to very distinctly position brands and clarify consumer perception of them. It succeeds in creating the addition of targets throughout the brand ensemble.

L'Oréal has developed strong brand radicalization savoir-faire, based on: (a) a respect of existing brands' integrity, (b) the capacity to create and nourish strong brand identities, (c) the identification of opportunities for new brands at the heart of the portfolio, (d) the power to integrate new brands, even smaller ones.

Brands Network Arbitration

At L'Oréal the brand portfolio is conceived as a network of brands in a dynamic equilibrium between incoming (ex: PureOlogy, Kiehl's) and outgoing brands (ex: Phas, Gemey), with strong flagship brands releasing important financial resources. Three balancing criteria have been established, which are: (a) mature brands (ex: Lancôme) / brands in development (ex: Skinceuticals); (b) highly profitable brands / in investment-stage brands; (c) already largely international brands / potentially international brands. Among the 25 brands of L'Oréal group, there are well-established stars (Giorgio Armani, Redken), stars-to-be (La Roche-Posay, Kiehl's), and then there are potential stars (Innéov, Matrix).

Brands Expansion Matrix

L'Oréal has achieved a very high level of modelization for its brand portfolio. The company has designed a model of development to define the path and order of launches in new segments, or new product categories or new countries. This model considers four dimensions which are:

*Segments of consumers * Product categories * Distribution networks * Countries*

The mission of this model is threefold.

First, to put the company's growth into a long-term context based upon the brand portfolio. Secondly, this matrix is prospective and dynamic by nature, because it allows for the identification of potential markets where companies could get a foothold.

Thirdly, the matrix defines reproducibility from countries that are the most advanced in the process to the others; and in particular allows for defining the order brands will be launched in the countries where the group is based.

Proposal for an interpretative model

The research shows that the juxtaposition of brands is one of, but not the sole, elements necessary for the development of a brand portfolio. At L'Oréal, a brand portfolio is a combination of a brand ensemble and key competencies born out of the company's organizational savoir-faire. These competencies have been built up over time and are difficult to understand from the outside. The results presented above lead us to propose an interpretative model connecting the results born out of our research. This model highlights:

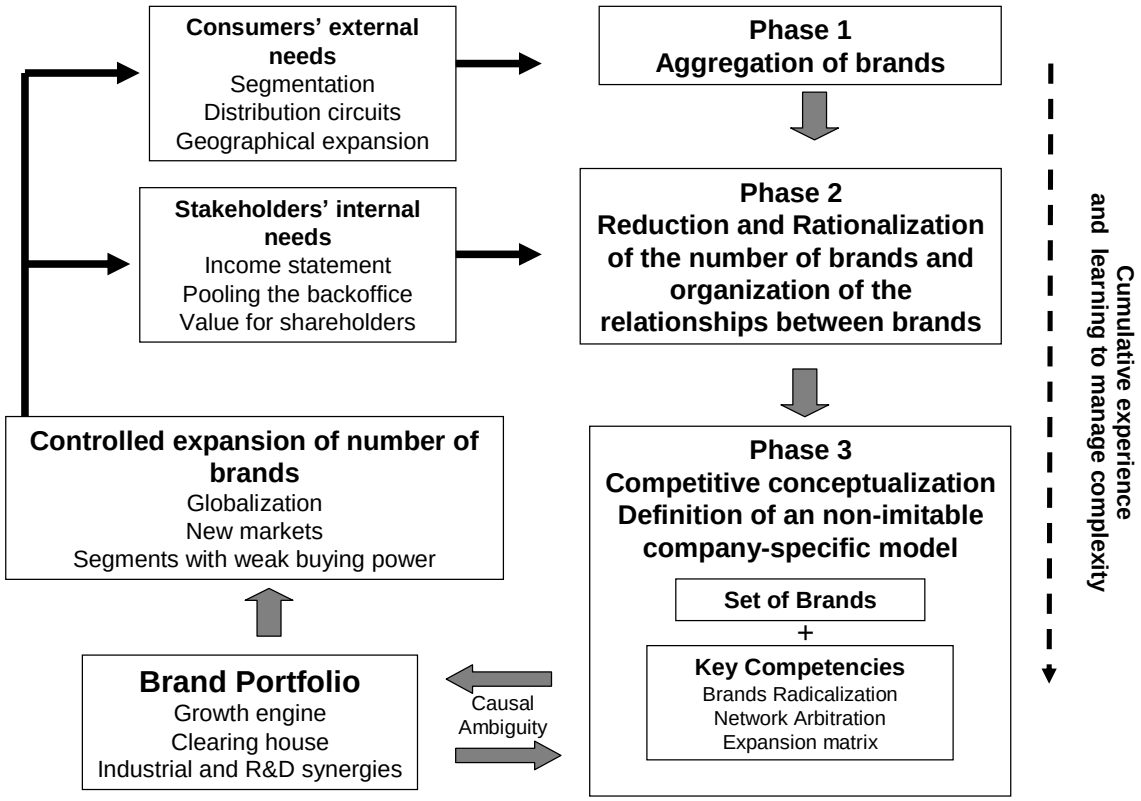
- Construction of a brand portfolio in phases, and the major role of company history and its accumulation of experience.

- The acquisition process of specific knowledge, savoir-faire and competencies by the company during this evolution.

- The link between lasting sustainable competitive advantage and a brand portfolio.

Figure 1 presents this interpretative model.

Figure 1 – A model: Transformation of a brands ensemble into a brand portfolio, source of lasting sustainable competitive advantage



DISCUSSION AND PERSPECTIVES

The research suggests three important considerations about brand portfolio-related management. The first lesson from our research supports the suggestion of a path dependency in the transformation of a brand portfolio into a sustainable and durable competitive advantage. Our study also brings to light the fact that the brand portfolio model is difficult to copy due to its idiosyncratic nature, and because it is a

powerful generator of causal ambiguity. Moreover our analysis suggests that a brand portfolio-building and evolution model is a permanent combination of a brand network and organizational competences, which makes it more difficult to imitate.

(a) The phases identified in the creation and implementation process for brand portfolios follow one upon the other with time, and competences are only acquired over the duration, phase after phase, which is characteristic of path dependency. The notion of path dependency (Dierickx and Cool, 1989; Teece et al., 1997) affirms that the history of a company influences its future and that time remains a primordial variable, one that is impossible to eradicate through supplementary financial investments.

(b) Brand portfolio management at L'Oréal is enmeshed in an internal ensemble of competences that offers protection from competitor replication because it creates an intangible, tacit barrier providing a formidable system of defense based on causal ambiguity (Weick, 1976; Orton and Weick, 1990). Causal ambiguity refers to the uncertainty pertaining to reasons for performance differences between companies. It hinders potential imitators from knowing not only what to imitate but how to do it (Reed and DeFilippi, 1990).

At L'Oréal, a strong causal ambiguity connects competitive advantage and brand portfolio because in the brand portfolio competitive conceptualisation stage, it becomes impossible to determine if the portfolio is in and of itself a source of competitive advantage, or if the results it generates (for example, harmonious growth, market presence, acceleration of globalisation) are not themselves the origin of a brand portfolio. It creates a strong entry barrier to competitors, and the difficulties in implementing and executing it represent a lasting and sustainable competitive advantage for L'Oréal.

(c) We also noted that the development of co-specialised assets makes them more difficult to imitate because they are not as common (Peteraf, 1993). This is even truer when an asset is the consequence of path dependency because this slows down the competition's ability to copy this second resource.

CONCLUSION

Our exploratory study, founded on a series of interviews with some of L'Oréal's principal leaders, analyses the way in which L'Oréal developed its brand portfolio and authenticates the existence of a link between brand portfolio and sustainable competitive advantage.

Three characteristic stages of the creation of the brand portfolio at L'Oréal have been identified. They are: (a) aggregation of brands over time, (b) the rationalization of this set of brands, and finally (c) the competitive conceptualization of a development model founded on the brand portfolio. This process led to the development of key-competencies issued from company history and experience. A brand portfolio must be considered as the combination of these competencies along with the set of brands owned by the company. The portfolio adds flexibility and adapts to the playing field by acting as a balancing fund whose objective is to insure harmonious and fluid growth of the company ensemble thanks to the obligatorily highly-radicalized and complementary positions of the brands between themselves.

Whereas many authors (Joao Louro and Vieira Cunha, 2001; Mattsson, 2006) are increasingly stating how brand management is a source of an inimitable competitive advantage and call for developing models for organizational brand strategies, our research widens the field of the brands analysis to its strategic dimension (Baldinger, 1990; Barwise and Robertson, 1992; Kapferer, 2000; Petromilli and Morrison, 2002; Riezebos, 2003).

APPENDIX A

L'OREAL KEY FIGURES

Turnover 2007
17063 million Euros

Profit
2039 million Euros

Turnover by region
Western Europe: 45.6%
North America: 25.2%
Rest of the world: 29.2%

L'Oréal business units and their international brands

Fast Moving Consumers Goods	Professional Products	Luxury Products	Active Cosmetics	The Body Shop
L'Oréal Paris Garnier Maybelline NY Softsheen Carson	L'Oréal Professional Kerastase Redken Matrix Mizani	Lancôme Biotherm Helena Rubinstein Kiehl's shu uemura Giorgio Armani Ralph Lauren Cacharel Viktor & Rolf Diesel	Vichy La Roche-Posay Innéov Skinceuticals Sanoflore	The Body Shop

(25 brands represent 93% of total turnover)

APPENDIX B

INTERVIEWEES

Level 1	**BD,** Vice-President **NR**, Assistant Managing Director Hair Care Division **LA**, The group's General Secretary **JC**, Garnier International Director **NH**, L'Oréal International Director **GL**, Lancôme Assistant Managing Director
Level 2	**JG**, Latin America Professional Goods Managing Director **AE,** Asia and Pacific Managing Director **MG**, France Luxury Goods Managing Director **MP,** France Professional Goods Managing Director **CR**, France Hair Care Managing Director
Level 3	**JB,** Latin America Managing Director **TH,** Middle East Managing Director **PL,** Eastern Europe Assistant Managing Director **JR**, Asia Public Goods Managing Director

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OIL CEASED TO BE A STRATEGIC RESOURCE?

Dr. Juan Carlos Gachúz Maya[1]

Nowadays it is common for some media, businessmen, politicians, etc... [2], to refer to oil as a raw material that is no longer strategic, that is inexpensive, readily available and that its use as an energizer has decreased. All these assertions, however, are not scientifically substantiated. Talking about Mexico and other countries that still maintain state ownership, this is sometimes used to mitigate and reduce its ideological importance and to convince various social sectors that its industrial character is now "obsolete" and thus achieve its privatization.

However, reality shows that, oil's replacement as an energy base is still a distant prospect, and the economic and industrial basis at the international level still depends heavily on this energy. Analysis indicates that the strategic nature of oil as an energy base will remain for at least twenty years. Prospective studies by the U.S. Department of Energy - for example - note that in those years, oil will remain the main source of energy at an international level, and most importantly, in all countries consumption will grow significantly [3] (see table 2 and 3).

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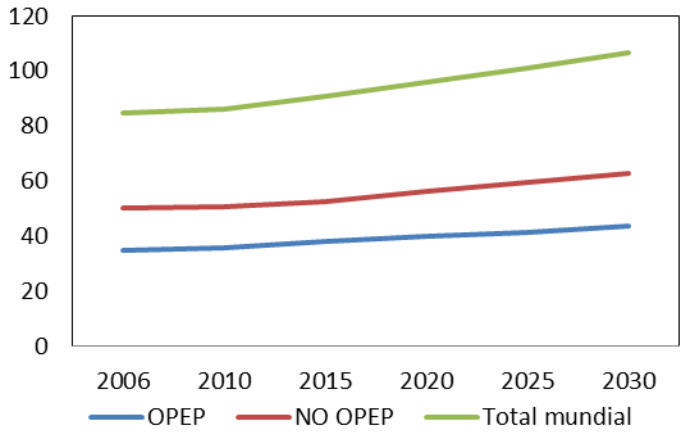
[2] I am talking about politicians, for example, Vicente Fox, who repeatedly has referred to oil as follows: "(...) nowadays to have human capital is more strategic that if we have natural resources. At this time, oil is less strategic (...) oil is no longer the strategic resource that it once was" see "Selling Pemex, oil ever", La Jornada, July 17, 1999.

[3] Such is the case of the USA, which is the largest oil consumer in the world and whose consumption will grow 0.9% annually through 2030. Source: Annual Energy Outlook 1996 with Projections to 2015, Energy Information Administration, U.S. Department of Energy, Washington D.C., 2010.

TABLE 2

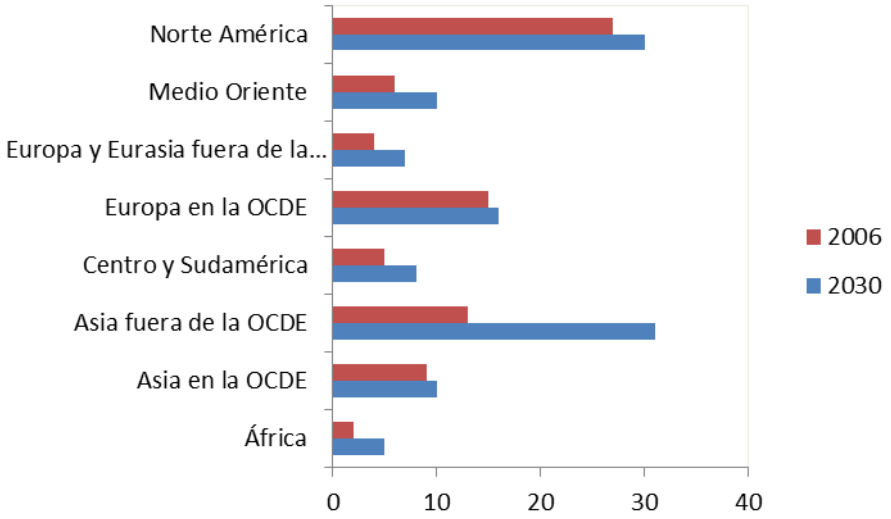
Worldwide Oil Projection 2006-2030
(Millions of barrels per day)



Source: Energy Information Administration. *Official Energy Statistics from the US Government. International Petroleum (Oil) Production*. [On line] [26 of March 2009] [Available on: http://www.eia.doe.gov/oiaf/ieo/pdf/liquid_fuels.pdf]

TABLE 3

World oil consumption by region and group of countries
2006 and 2030
(million barrels per day)



Source: Energy Information Administration. Official Energy Statistics from the US Government. International Petroleum (Oil) Production. [On line] [26 of March 2009] [Available on: http://www.eia.doe.gov/oiaf/ieo/pdf/liquid_fuels.pdf]

In the last decade, even with price fluctuations, oil consumption worldwide has increased significantly. Table 4 shows that from 22 selected countries only 2 reduced their consumption over the period 2002-2007: Russia, which faces serious economic problems primarily in the industrial sector, has reduced its consumption considerably; this is not however as a result of replacing and saving oil, it´s about closures and restructuring its companies.

Germany is another country which has reduced its oil consumption, though in this case by using new energy sources, increasing the efficiency of its use, and recycling products made from petrochemicals and developing technology which can save more energy and reduce oil consumption.

However, even with this reduction in consumption, oil is the main energy source in Germany. Worldwide most countries are highly oil dependent, with oil being their main energy source. It is also worth mentioning that in most cases the oil consumed is imported.

All industrialized countries without exception consume large quantities of crude oil, their industrial infrastructures are designed for performance and development based on this energy, and, as established by

the U.S. Department of Energy, this situation will not change in short term. Energy replacement will need time and resources to materialize

TABLE 4
WORLD PETROLEUM CONSUMPTION,
(2002-2007)
(Thousand barrels per day)

Rank	Country	Consumption 2002	Consumption 2007	Annual Average
1	United States	19,761.30	20680.38	4.65%
2	China	5,160.71	7565.00	46.59%
3	Japan	5,317.22	5006.66	-5.84%
4	Russia	2,636.41	2820.00	6.96%
5	Germany	2721.64	2456.00	-9.76%
6	India	2,263.44	2800.00	23.71%
7	Canada	2,087.41	2367.35	13.41%
8	Brazil	2,131.60	2400.00	12.59%
9	Korea, South	2,149.15	2214.09	3.02%
10	Mexico	1,950.11	2119.13	8.67%
11	Saudi Arabia	1,676.25	2210.00	31.84%
12	France	1983.25	1949.95	-1.68%
13	United Kingdom	1,738.64	1740.48	0.11%
14	Italy	1870.13	1701.74	-9.00%
15	Iran	1,350.35	1708.00	26.49%
	TOTAL	**54,797.61**	**59371.00**	**8.35%**
	WORLD TOTAL	**78,089.42**	**85899.74**	**10.00%**

Source: Energy Information Administration. Official Energy Statistics from the US Government. International Petroleum (Oil) Production. [On line] [22 of March 2009] [Available on: http://www.eia.doe.gov/emeu/international/oilproduction.html]

In Table 4, we see a rapid growth in oil consumption. U.S. (4.65%), Mexico (8.67%), Japan (5.84%) have all increased their consumption in the period 2002-2007, the increase in oil consumption, however becomes even more dramatic in the case of China (46.54 %), India (7.4%) and Saudi Arabia (12.59%).

Another international oil market feature is the concentration in oil production and consumption at regional level. In Table 5 we can see that 47% of oil exports are concentrated in 9 countries (Saudi Arabia,

Russia, Norway, UAE, Iran, Kuwait, Nigeria, Venezuela, and Algeria). Table 6 show us that oil imports are also concentrated in just a few countries: U.S., Japan, China, Germany, South Korea, France, India, Italy, Spain, Taiwan, Netherlands, Singapore, Turkey, Belgium and Thailand, these countries import 43% of the global total, with the USA, which consumes 25% of all the oil produced, standing out from all countries worldwide.

TABLE 5
TOP WORLD OIL NET EXPORTERS (2006)
(THOUSAND BARRELS PER DAY)

Rank	**Country**	**Exports**
1	Saudi Arabia	8,595
2	Russia	6,845
3	Norway	2,557
4	United Arab Emirates	2,532
5	Iran	2,494
6	Kuwait	2,362
7	Nigeria	2,175
8	Venezuela	2,161
9	Algeria	1,863
10	Mexico	1,632
11	Libya	1,553
12	Iraq	1,446
13	Angola	1,380
14	Kazakhstan	1,153
15	Qatar	1,040
	Subtotal	39,788
	% del Total Mundial	47.06%

Source: Energy Information Administration. Country Energy Profiles. [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm.]

TABLE 6
MAJOR OIL IMPORTERS (2006)
(thousand barrels per day)

Rank	**Country**	**Imports**
1	United States	12,357
2	Japan	5,068
3	China	3,379
4	Germany	2,542
5	Korea, South	2,160
6	France	1,908
7	India	1,804
8	Italy	1,578
9	Spain	1,558
10	Taiwan	935
11	Netherlands	926
12	Singapore	848
13	Turkey	634
14	Belgium	627
15	Thailand	610
	Subtotal	36,934
	% of the world total	43.69%

Source: Energy Information Administration. Country Energy Profiles. [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm.]

As we can see in Table 7, oil production is concentrated geographically in 15 countries (Saudi Arabia, Russia, United States, Iran, China, Mexico, Canada, United Arab Emirates, Venezuela, Norway, Kuwait, Nigeria, Brazil, Algeria and Iraq) which produce nearly 80% of global production, with just a few countries producing large quantities and others making the most important -economically speaking- imports.

TABLE 7
MAJOR OIL PRODUCING COUNTRIES

Rank	Country	Production
1	Saudi Arabia	10,665
2	Russia	9,675
3	United States	8,331
4	Iran	4,149
5	China	3,856
6	Mexico	3,710
7	Canada	3,287
8	United Arab Emirates	2,945
9	Venezuela	2,806
10	Norway	2,786
11	Kuwait	2,678
12	Nigeria	2,443
13	Brazil	2,167
14	Algeria	2,122
15	Iraq	2,010
	Subtotal	63,630
	Otros	20,912.90
	Total	**84,542.90**

Source: *Energy Information Administration. Country Energy Profiles*. [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm.]

Because industrialized countries lack sufficient reserves to ensure their consumption in the medium and long term, and in a context of open confrontation of the various regional blocs (mainly North America, Europe and Asia), the persistent search to control external oil resources has been aggravated due to the urgent need to raise production levels and productivity, and compete more decisively for market supremacy and leadership in the global economy.

In this sense, access and direct control of the main routes for transporting oil and essentially unfettered control of the oil reserves of the major producing countries will remain one of the key objectives of the major industrial powers.

Oil as a strategic raw material, indispensable for the transport sector and industrial production, has been used more intensively by the great industrial powers.

This issue, which transcends national safety standards by its importance, is very pronounced when we refer to USA, which is the biggest consumer (consuming a quarter of the oil produced worldwide) and since the early seventies has been faced with oil production problems and a severe decline in its reserves.

Since the energy crisis in 1973, and because of the U.S's extreme dependence on oil imports, especially from the Persian Gulf, the U.S. Government has managed a strategy to get the ownership of Mexico's oil resources and industry, and those of all important producers in Latin America. Their method to achieve this goal is to put pressure on them through both the U.S. Government and also its financial institutions to achieve the privatization of strategic industries in these peripheral countries.

In the specific case of Mexico, their economic policy shifted in 1982 to find a way to get a quick response to their demands. This has led to serious risks to the economic and political sovereignty of our country.

As we shall see in Chapter 3, the introduction of neoliberal economic policies, the management of Petroleos Mexicanos, - and generally the management of the whole oil industry - has responded primarily to the needs of U.S. multinational companies, and has neglected the most elementary considerations of the national interest of our country.

The U.S. oil dependence

In the previous section we analyzed the main features in oil production and consumption of oil worldwide. As has already been mentioned, talking about consumption, USA is at the top of the list. Since early last century, this country has been characterized by its technological and industrial sectors which have been developed based on oil. Economic, political and military competition against the USSR during the Cold War forced the U.S. to search for -at all costs- an accelerated economic development which "urgently" needed supply oil sources for their own maintenance and development.

Especially after the '50s, the oil wells mainly in Texas, Louisiana and Oklahoma, were exploited almost to their maximum, subsequently, new oil regions were discovered in the north of the country and in Alaska, which served to mitigate some of the energy needs in the North America industry. This sector, which was developing and expanding rapidly, and the maintenance of this expansion and development became governmental policy, increasing oil imports from abroad especially from the Persian Gulf region.

After 1973 and the Arab oil embargo, the U.S. was finally confronted with the reality of its energy situation that had been growing in recent decades. Domestic oil sources were not sufficient to provide enough oil to maintain its huge industrial plant, to feed domestic consumption, much less to supply the sensitive military area.

Carter's energy strategy besides providing supplies to the Strategic Petroleum Reserve and making energy savings, also sought to encourage diversification of energy sources as alternative to oil through research at universities and technology institutes in the U.S. and in different centers of research of large multinational oil companies.

However, even with the maneuvers of the U.S. government and its corporate, the expense of its oil imports and the effect of this on its economy remained a major geo-economic vulnerability for the country. In

2007, U.S. imported more than 12 MBD of oil and petroleum which represented an expenditure of almost 200 billion dollars[1], undoubtedly a very high amount even for the U.S., despite this the economic costs are not the most important problem. Their vulnerability is the dependence of their different economic sectors with respect to oil, also the possibility of an interruption in the supply of such energy for political problems, or even terrorist acts, which is the main concern of U.S. intelligence department.

All the U.S. government efforts to replace oil as an energy base have not yet yielded the expected results. Insufficient participation of the alternate energy sources to oil is one of the main factors that have heightened the strategic oil dependence. And although there have been advances in the production and consumption of other energy sources (such as coal and natural gas) the facts show that crude oil (and its derivatives) remains the primary source of energy consumption in the U.S. with over 40% of total energy consumed in the US coming from it. If we look at its consumption by sector, in some cases this percentage increases dramatically, for example, in the transport sector it´s over 90% of the total and in the industrial sector it is more than 55%[2].

The highly publicized achievements in production and consumption of other energy sources as alternatives to oil, such as solar, geothermal and wind power are found to be a gross exaggeration, the facts show that the consumption sum of such energy in the U.S. does not represent even 1% of total energy consumed in that country. [3]

It is common however that technological advances in the development of energy sources as alternatives to oil spread rapidly in the U.S. population. Some social sectors already have access to solar panels or electric cars; however, most of people are still using fossil fuel, which is reflected in the total energy consumption in that country.

In the U.S., as in most countries around the world, oil is the main energy source. It would be difficult to predict the magnitude of the disaster that would happen in this country if their imported oil supply were to be interrupted; and wasn´t enough to supply their industrial, domestic, transport and especially the military industry. The most powerful country would be damaged alarmingly. The problem is therefore a national security issue for the U.S. government.

Under these assumptions, we consider it advisable to study the main variables of the U.S. oil industry based on a statistical analysis of its current situation. This analysis includes information and production data, consumption, imports, reserves and some economic and strategic elements which can determine the implementation of U.S. energy strategy today.

[1] EIA/DOE *Monthly Energy Review, July, 2010*, p. 141.

[2] EIA/DOE U.S. *Annual Energy Review, 2010*.

[3] Ibídem.

The oil industry situation in USA: Serious declines in production and productivity

The main problem that USA is facing in its internal energy sources is certainly the decline in oil production. America is a country with large oil regions and is rich in fossil fuels, however, it´s a large country, with a population of over 300 million inhabitants and a huge industrial equipment and transportation, consumption exceeding production by more than 50%. The origins of this serious problem are in fact recent, since 1950 and up to the end of 1969, crude oil production capacity turned out to be almost sufficient for domestic consumption. During this period, oil imports never exceeded the level of 3 Million Barrels day (MBD). So, although the situation was not encouraging, due to the accelerated development required by the economic and military sector in its fierce competition against the USSR, it was by to some degree sustainable.

The scenario began to change in 1970, when the widespread use of internal combustion engines and domestic heating systems led to, among other things, an oil demand increase (almost 15 MBD), the production of oil however failed to increase as expected (9.64 MBD) which spurred a great increase in imports (3.2 MBD).[1]

The problem became dramatic in 1973, when the Arab embargo hit the U.S., causing a global energy crisis. In the same year, oil demand in the U.S. came to 1730 MBD, while production fell for the first time to 21.9 MBD. Since then, imports have increased at a very high rate. A year later oil prices increased to 4 times their original price, generating severe problems in the USA economy because of the increase in the price of many products. It was then that people started to talk about "national security" problems.

At a regional level since the late 1970s and until 1988, the new oil deposits of Alaska partially offset the low production in the region "Lower 48". In 1989, however, Alaskan production fell for the first time, and this trend is continuing today and shows no signs of reversing. In 1997 the total U.S. crude production was 6.44 MBD, the lowest level in 35 years (see Table 5).

Since 1986 oil production in that country has declined steadily, in just 12 years (1986-2010) the total production dropped down from 8.6 MBD to 7.4 MMBD, a decrease of 1.2 MBD.

Besides not having positive results in exploration and finding new oil fields, the expectations for the productivity of existing wells has also declined alarmingly. In 2007 the average productivity of the wells was at its lowest level in history (see Table 8). As regards projections, between1997 and 2010 it is estimated that production will have an annual decrease of -1.4%, the most serious setback in the production of primary energy sources in the USA.[2]

[1] Energy Information Administration/ *Annual Energy Review, 1994.*

[2] *Annual Energy Outlook 2010 with projections to 2030*, p. 73.

TABLE 8

CRUDE WELL PRODUCTIVITY 1955-2007

Year	Producing Wells	Total Production	Average Productivity (Barrels per Well)
1955	524	6,807	13
1960	591	7,035	11.9
1965	589	7,804	13.2
1970	531	9,637	18.1
1975	500	8,375	16.8
1980	548	8,597	15.7
1985	647	8,971	13.9
1990	602	7,355	12.2
1995	574	6,560	11.4
1996	574	6,465	11.3
1997	573	6,452	11.3
1998	562	6,252	11.1
1999	546	5,881	10.8
2000	534	5,822	10.9
2001	530	5,801	10.9
2002	529	5,746	10.9
2003	513	5,681	11.1
2004	510	5,419	10.6
2005	498	5,178	10.4
2006	497	5,102	10.3
2007	500	5,103	10.2

Source: Energy Information Administration. Official Energy Statistics from the US Government. International Petroleum (Oil) Production. [On line] [22 of March 2009] [Available on: http://www.eia.doe.gov/emeu/international/oilproduction.html]

After the Second World War, the U.S. implemented economic policies designed to accelerate capital accumulation and domestic industrialization. The population saw the benefits of new technological advancements which brought with themselves greater comforts and services but, at the same time required larger volumes of oil as energy and raw material for the manufacture of a variety of materials and products.

This context determined a growth in oil consumption and oil, during 1949 to 1973 the annual average of which was 4.7%. In 1973 consumption was 17 MBD. In 1974 after the Arab embargo and price

increases of almost 400%, there was a decline of 3.8% in oil consumption. However demand recovered in 1978, reaching almost 19 MBD, but by 1983 consumption had fallen back to 15 MBD.

The Cold War and emerging divisions within OPEC determined the oversupply of oil, prices dropped and consequently its consumption increased in 1989 to 17.3 MBD. Since then, there has been an increase in consumption, reaching in 1997 20.68 MBD (see Table 9). This growth trend in consumption does not seem to be stopping; in fact continuing decrease in the oil prices could make the consumption rise.

USA has huge geographic territory, that factor added to their number of inhabitants determined since the nineteenth century the construction of a complex transport structure across the country. Because of the gigantic system of roads and highways in USA, the largest sector in terms of oil consumption is the transport sector. 20.68 MBD are consumed in the U.S., and almost 3/4 is used for consumption by the transport sector (gasoline, diesel, jet fuel, fuel oils, lubricants, etc…). In 1994, it consumed 14.23 MBD of crude oil and petroleum in the transport sector, which represented the highest level in U.S. history (see table 9).

Even with the energy saving policies and the use of natural gas (which is also a fossil fuel), oil consumption projections indicate that from 1995 to 2015 it will increase 0.9% per year. This situation is dramatic in the U.S. energy sector and in its whole economy, because as we have seen, production has been falling by -1.4% per year, causing an increase in imports (which now are exceeding 50% of the total bill).[1]

TABLE 9

Oil consumption * and total consumed in USA in areas such residential, commercial, industrial and transport (1950-1997).

(Millions of barrels per day)

Year	Residential & Commercial	Industrial	Electricity	Transport	Total
1980	1516.685	4842.249	1150.574	9546.353	17055.861
1985	1344.72	4065.342	478.275	9838.081	15726.418
1990	1231.369	4303.739	565.818	10887.57	16988.496
1995	1128.222	4594.005	334.103	11668.259	17724.589
2000	1280.128	4903.479	505.203	13012.266	19701.076
2005	1197.905	5100.257	546.572	13957.428	20802.162
2006	1030.852	5189.389	289.027	14178.15	20687.418
2007	1028.655	5124.715	292.704	14234.304	20680.378

N/A: No Available

[1] *Annual Energy Outlook 1996 with projections to 2015, p.p. 70-71.*

* Includes others oil, gasoline blending components, hydrogen, benzene, alcohol, etc. Source: Energy Information Administration. Country Energy Profiles. Historical Data [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm.]

Rising imports and declining stocks

The main concern of USA is its oil imported dependence. Being dependent on external circumstances that exceed the capacity of USA action is a strategic and latent risk which has direct implications for national security. It is also important to mention that some products imported, including strategic raw materials always have a risk. Distance between exporting and importing, risks and transport costs, danger of some mechanical breakdown or accident, are factors that should always be taken in consideration in oil imports. Despite government moves to stop the oil and petroleum import volume (taxes and import quotas, state and federal), petroleum imports and petroleum products increased between 1949 and 1975; mainly because of low prices abroad and the increased production costs at home and the increase in total domestic consumption. In 1973 imports reached 6 MBD, and then, imports fluctuated reaching 8.3 MBD in 1977 and 5 MBD in 1985. In 1986 global oversupply brought prices down, inhibiting the production and increasing domestic demand, all these factors influenced increasing imports in 1986 to 6.2 MBD, subsequently with significantly lower prices, imports reached 8 MBD in 1989 and 1990. In 1991, oil demand fell due to U.S. economic recession, which contributed to a decline in imports; in 1991 they fell to 7.6 MBD. However, from 1992 to 2007 petroleum import and use increased explosively, with the US importing 12 MBD[1] in 2007, the highest import in U.S. history.

TABLE 10

Main exporter of oil to USA and total imports of petroleum and petroleum (1980-2007) (thousand barrels daily)

Year	Canada	Venezuela	Nigeria	Saudi Arabia	Mexico
	(thousand barrels / day)	(thousand barrels / day)	(thousand barrels / day)	(thousand barrels / day)	(thousand barrels / day)
1980	454.538	481.243	857.421	1260.56	533.068
1985	770	604.84	292.678	167.629	815.895
1990	933.858	1024.627	799.888	1339.227	755.052
1995	1332.137	1480.263	627.353	1343.8	1067.581
2000	1806.97	1546.079	896.391	1571.787	1372.975
2005	2181.422	1529.197	1165.589	1536.501	1662.332
2006	2352.984	1419.033	1114.142	1463.405	1705.227
2007	2454.729	1360.778	1134.06	1484.896	1532.34

[1] EIA *Annual Energy Review*, 2010, p.141.

* From 1977 includes imports for the Strategic Reserve (SPR).

Source: Energy Information Administration. Country Energy Profiles. Historical Data [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm

U.S. economic policies to promote diversification of oil suppliers have been successful. Saudi Arabia, Nigeria, Venezuela, Canada and Mexico are the main suppliers of oil to the U.S. In this sense, we note that oil exports from the last three mentioned countries have increased but, regarding Saudi Arabia and Nigeria their exports to the USA have been reduced. In 1981 Saudi Arabia exported one million 800 thousand barrels per day to U.S., by 2007 this amount was significantly reduced to 1 million 483 thousand barrels per day. The reason for these changes in oil imports is predominantly strategic. A tanker from Latin America takes at least 7 days to arrive to USA, whereas the same tanker from the Middle East takes at least 45 days to arrive to North American territory[1].

The origin of imports, however, does not determine a decrease in volume, on the contrary, even with U.S. tactics to reduce its oil dependency; rising oil and gas imports always will be a national security subject. There is another problem to add to the problems we were discussing about, and it is: REP decline[2].

As seen in Table 11, in 1985 this reserve was sufficient to supply the country with no need to get imports for 115 days; in 2007 the volume stored in the SPR only guaranteed 58 days.

TABLE 11

Strategic petroleum reserve (spr) of USA (1977-2007)

Year	Volume (thousand barrels)	Consumption days/ net imports
1977	7,455	1
1978	66,860	8
1979	91,191	11
1980	107,800	17
1981	230,341	43
1982	293,827	68
1983	379,089	88
1984	450,505	96
1985	493,316	115
1986	511,565	94

[1] Read about it in, OPEC Bulletin, April 1997, Vol. XXVIII, No.4, p. 16-17.

[2] Since the Arab oil embargo to the U.S. that sparked global energy crisis of 1973 and designed for national security purposes, the SPR was officially formed in 1976 by the Carter administration who believed that the existence of a reservation of the order of 500 to 1000 million barrels of oil would ease - at least in part - the uncertainty or risk with a new embargo or interruption of oil flows to the U.S.

1987	540,648	91
1988	559,515	85
1989	579,857	81
1990	585,692	82
1991	568,508	86
1992	574,724	83
1993	587,080	77
1994	591,670	73
1995	591,640	75
1996	565,816	67
1997	563,429	62
1998	571,405	59
1999	567,241	57
2000	540,678	52
2001	550,241	50
2002	599,091	57
2003	638,388	57
2004	675,600	56
2005	684,544	55
2006	688,605	56
2007	696,941	58

Source: Energy Information Administration. Country Energy Profiles. Historical Data [On line] [22 of March 2009] [Available on: http://tonto.eia.doe.gov/country/index.cfm.]

This USA oil dependence situation has forced its government and companies to rethink strategies and tactics to supply their domestic economic sectors with oil. The main focus of this strategy is primarily the import of large volumes of oil at low prices in neighboring countries in which U.S. has political influence and economic leverage to ensure oil supplies.

The oil imported transformation of U.S. territory, achieving the highest value added to products, creating an industrial and business network, and the absorption of smaller oil companies are the main tactics implemented by multinational oil companies.

LOS ESFUERZOS NO SON EN VANO. FRENO AL SIDA EN UGANDA

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Florence Kumunhyu. Iganga, Uganda
Fue un proceso muy largo tras la muerte de mi marido en 1990, pero recuperé la confianza en mí misma y decidí formar un grupo aquí en el distrito de Buwolomera en Iganga, la Asociación para el desarrollo de Buwolomera. […] Muchas personas se rieron cuando les dije que tenía la enfermedad. Cuando paseaba por el pueblo decían a mis espaldas "Esa mujer tiene sida". Tuve muchas dificultades con mis cuñados. Algunos de ellos querían casarse conmigo y cuando les dije que tenía VIH dijeron que estaba mintiendo para evitarlos (Medel, 168).

En la actualidad existe un problema que abarca diferentes sectores de la sociedad humana, se llama síndrome de inmunodeficiencia adquirida mejor conocido como SIDA. Es la enfermedad que el Virus de Inmunodeficiencia Humana (VIH) causa; esta enfermedad produce en el cuerpo humano una respuesta inadecuada hacia padecimientos infecciosos dejándolo indefenso contra cualquier problema orgánico, volviendo mortales hasta los más simples resfriados. El virus se dice que se originó en África y es ahí donde se presentan los mayores problemas, esto debido a las diferentes carencias con las que se vive en las diferentes regiones. El objetivo de este ensayo es dar a conocer la situación en Uganda y su relación con la enfermedad. La falta de educación sexual, carencias en alimentación y calidad de vida propician que el impacto del VIH sea grande y su propagación rápida, volviéndose terriblemente difícil de controlar ya que hay pocas medidas para frenarlo y no existe una cura hasta ahora.

Lo que nos dice el caso de Uganda

Desde hace casi 30 años que se identificaron los primeros casos de SIDA, el primer caso oficial sucedió en 1979 en la ciudad de Nueva York, pero se sospecha que pudo haberse manifestado previamente en otras áreas geográficas. El término sida no se acuñó hasta el año de 1982; previo a esta fecha se le conocía como "cáncer gay"; hay diversas teorías de cómo surgió la enfermedad e inclusive hay una minoría que la considera inexistente, una de éstas teorías y de las más aceptadas sostiene que surgió en África. En 1979 estaba presente en jóvenes homosexuales africanos que se enfermaron de neumonía y de un raro cáncer de piel conocido como sarcoma de Kaposi y desde ese momento se empezó la propagación y la búsqueda de una cura. El África-subsahariana abarca todo el sur del continente a partir de donde termina el desierto del Sahara, esta región incluye varios países en extrema pobreza y con conflictos de carácter político-social. En ésta región se encuentra Uganda. La desinformación y la falta de una educación sexual han hecho difícil combatir el virus, sin embargo, desde la llegada del Presidente Yoweri Musevini al poder en 1986, se ha hecho un gran esfuerzo en Uganda para combatir sobre todo la falta de información y el desconocimiento de la enfermedad y de mano a esto se ha exhortado a otros países Africanos a que se unan a la lucha contra ésta epidemia.

Uganda es el país africano que más éxito ha obtenido en su lucha contra el SIDA en los últimos doce años y es considerado un ejemplo a seguir sobre las acciones que se deben tomar en contra de este mal. En Uganda, en lugar de hacer campañas que sólo promuevan el uso del condón para la prevención de la enfermedad, el gobierno ha apostado a generar cambios en la conducta sexual de sus habitantes y en alentar a los jóvenes a empezar su vida sexual a mayor edad, tanto como ser monógamos o poseer menos parejas sexuales a lo largo de su vida, en adición a esto se han implementado programas de apoyo a la mujer buscando mejorar su estatus social para evadir la prostitución. Esta combinación de diferentes campañas y aproximaciones a la enfermedad se conoce como el programa ABC por sus siglas en inglés, "Abstain, Be faithful or use Condoms"; de esta manera si no se cumple con la A o la B todavía queda la C, con esto se han logrado grandes avances en la estadística de ugandeses infectados con el virus del VIH. Pero a pesar de haber reducido un 50% sus

números de casos infectados la ONU y la Organización Mundial de la Salud no han reconocido sus logros.

En México el SIDA es un factor presente en todo el país y como en Uganda se están tomando acciones preventivas en contra de la epidemia. En el país africano se tomó un ataque totalmente frontal hacia la epidemia, todos los miembros políticos y religiosos están ahora inmiscuidos en la prevención de la expansión del SIDA, promoviendo normas de comportamiento sexual, reconociendo abiertamente la existencia del SIDA en 1986 y fundando "Uganda AIDS Commission" en 1999. Primeramente en Uganda se enfrentó un grave problema con la oposición religiosa, como lo tiene México actualmente por el uso de preservativos de látex (condón masculino y femenino), pero Uganda logró el apoyo religioso, con el apoyo a la educación sexual y logrando hacer conciencia de la enfermedad. Claramente hay diferencias de cómo se hacen las cosas aquí en México y en Uganda.

En México al ser un país más desarrollado que Uganda, existe un apoyo económico mayor en cuanto a combatir el SIDA; las medicinas en México son totalmente gratuitas para las personas infectadas con el VIH, que acudan a un centro de salud, según el CONASIDA que es el Centro Nacional para la Prevención y el Control del VIH/SIDA. Esto es algo más difícil en Uganda debido a que el país está dividido en tribus separadas por grandes distancias y que a pesar que hospitales mandan camiones con medicinas para las personas con la enfermedad, no se dan abasto para atender a 1,200,000 personas que viven con VIH/SIDA comparando con los 141,356 casos registrados en México, en Uganda la situación es en verdad crítica y por eso una campaña que utilice solamente el condón como método de protección en contra de la enfermedad no es suficiente pues como afirmaba el propio Musevini "We are being told that only a thin piece of rubber stands between us and the death of our Continent ... they cannot become the main means of stemming the tide of AIDS". En México se tiene como principal objetivo la distribución de preservativos, que sean accesibles a todas las personas que sepan usarlos y que además se distribuyan en "grupos de riesgo": homosexuales, usuarios de drogas inyectables, trabajadores/as sexuales y sus clientes, personas privadas de su libertad y por supuesto las ya infectadas con el VIH/SIDA. Extrañamente y contrario a lo que marca el gobierno mexicano, los autores del libro *Prevenir el SIDA* califican esta clasificación de incorrecta y que se deben de tomar en cuenta factores de riesgo y no grupos de riesgo.

Kenia, Uganda y el SIDA

Kenia y Uganda son países con usos y costumbres muy parecidos debido a la zona geográfica en la que se encuentran. Están localizados de manera contigua en la zona central-oeste del continente africano. Ambas naciones presentaron sus primeros casos de infectados con el VIH casi simultáneamente así como de una manera muy similar, sin embargo las acciones que se tomaron en cuenta para la erradicación o la prevención, fueron bastante distintas. Primeramente, Uganda fue el que diagnosticó a los primeros contagiados y probablemente no de manera inmediata pero sí en una etapa "temprana" se emprendió una serie de acciones políticas en los sectores privados e incluso religiosos con el fin de lograr un control y disminución de los afectados. Por el otro lado Kenia, que tuvo contagios registrados aproximadamente dos años después que Uganda, negó que la enfermedad fuera real y por consiguiente no se hicieron las gestiones necesarias de salubridad y de concientización necesarios. Los resultados fueron que en Uganda la tasa de prevalencia disminuyó casi a la mitad en 10 años tras haber implementado las labores de salud. Kenia, a pesar de poseer porcentajes bajos en sus conteos, ha ido aumentando progresivamente hasta mostrar el resultado del décimo año de conteo una cifra 5% más elevada que Uganda, lo cual reafirma su menor grado de atención al problema.

La respuesta gubernamental en Uganda fue evidentemente positiva, se comenzó a trabajar en la educación sexual de su población, desde la abstinencia, fidelidad en el matrimonio o las relaciones en pareja y como tercera opción el uso de los condones. Después de un largo entrenamiento, los líderes islámicos comenzaron a dar cátedras a sus creyentes sobre éstos métodos para lograr mejores resultados, funciones y estrategias que ciertamente funcionaron de la manera esperada. Kenia, por su parte, tuvo un avance lento y tedioso, debido a que todavía se afirmaba que el SIDA era una enfermad que se presentaba únicamente en los homosexuales. Las estadísticas contradecían tal afirmación; puesto que, el número de prostitutas infectadas aumentó de un 4% a un 80% en tan sólo dos años. A pesar de los esfuerzos que se hacían en las escuelas mediante clases de educación sexual, éstas

desgraciadamente fueron rechazadas por los padres de familia y por el sector religioso, con lo que finalmente las instituciones vinculadas terminaron por abandonar sus esfuerzos de advertir a la gente. Fue hasta 1999 en que después de un debate del parlamento que duró algunas semanas, se retomaron los intentos con la creación del "Kenya's National AIDS Control Programme", institución que sin embargo mantiene hasta hoy en día una baja importancia política, ya que sigue reprimida por los grupos religiosos del país.

A modo de conclusión, ¿qué sabemos?

Para éste ensayo decidimos evaluar el conocimiento de los alumnos del 6to semestre de Prepa Tec, Campus Puebla. Se realizaron 20 encuestas con preguntas relacionadas a la situación del VIH/SIDA tanto en México como en Uganda. A partir de las encuestas realizadas logramos las siguientes conclusiones. Al preguntar a los alumnos sobre su conocimiento de la situación en Uganda la mayoría respondió que sabían poco, esto demuestra que a pesar de estar recibiendo una educación de primera calidad, el conocimiento de los avances en el combate contra el SIDA a nivel internacional no ha recibido la atención que merecen. También descubrimos que la mayoría de los encuestados consideran que las condiciones de vida en Uganda son las principales razones por las cuales se ha propagado de manera acelerada el VIH; incluyendo la pobreza, las carencias de servicios y la falta de educación. Sin embargo desconocen los progresos que se han obtenido en Uganda. Todos coinciden que la discriminación es un factor aparte que conlleva la enfermedad.

En suma, podemos confirmar que el SIDA es una de las enfermedades con más variantes y efectos mortales en el mundo. La falta de información acerca de ella, ha ocasionado que los países con menos oportunidades de progreso no tengan la posibilidad de enfrentar la enfermedad como tal, ni las consecuencias que conlleva tanto médica como socialmente. Pero Uganda, a pesar de no tener los recursos ni una situación favorable ha logrado con mucho esfuerzo obtener importante resultados en lo que se refiere a campañas de prevención, logro que sin embargo no ha sido reconocido oficialmente por la ONU y que debería de serlo, ya que con el reconocimiento vendría la divulgación con lo que el éxito que se ha tenido en la lucha contra el VIH/SIDA llegaría a estar presente no solo en Uganda sino también en aquello países que identifiquen los efectos positivos de contar con una estrategia integral de combate a este grave problema.

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RECICLAJE Y REUTILIZACIÓN DE ARTÍCULOS ELÉCTRICOS Y ELECTRÓNICOS (RAEE)

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Resumen:

En el presente trabajo se hace un análisis breve de cómo los aparatos electrónicos tienen en la actualidad gran importancia en la vida cotidiana, pero desafortunadamente el tiempo de vida y el mal uso de estos equipos termina en su desecho, pues su tiempo de vida útil es aproximadamente de los 18 meses hasta un término no mayor de los 10 años. Así, el presente documento tiene el propósito de hacer conciencia respecto a este mal inevitable. De igual manera, se plantea en forma propositiva que la educación en la reutilización, reciclaje y recuperación de los equipos eléctricos y electrónicos resulta de primordial importancia.

Palabras clave: Basura electrónica, Materiales de desecho, RAEE

El problema de los desperdicios eléctricos y electrónicos

En la actualidad existe una notable brecha entre la vida útil de los electrónicos y el tiempo real de uso de los mismos, esto se debe al patrón de consumo de favorecer a las más nuevas y avanzadas tecnologías así como el hecho de que la competitividad en un mundo globalizado ha conducido a una acelerada tasa de innovación de dispositivos como computadoras, celulares, reproductores y demás *gadgets* electrónicos, haciendo que las nuevas tecnologías reemplacen a las anteriores en muy poco tiempo.

Es un hecho que la mercadotecnia y las estrategias de ventas actuales tienen precisamente como factor clave que los electrónicos sean difíciles de reparar, fáciles de romper y difícilmente se puedan mejorar para competir con tecnologías posteriores, haciendo la compra de una nueva unidad para el usuario la opción más viable. Para muestra basta un botón.
¿Cuántas veces no nos ha sucedido que el viejo reproductor de DVD se descompuso y al llevarlo a reparación nos encontramos con que comprar uno nuevo con mejores características y más funciones cuesta una fracción de lo que cuesta reparar el viejo DVD?

Lo anterior ha conducido a una industria electrónica no sustentable, pues las personas consumen varias veces el mismo producto y la mayoría de éstos terminan como basura electrónica, donde la proporción de reciclaje es mínima con respecto a las tasas de producción. El problema de no reciclar todo este desecho electrónico se encuentra en la naturaleza de su fabricación, por ejemplo: Los artículos eléctricos y electrónicos contienen altas concentraciones de elementos tóxicos y nocivos para el medio ambiente y la salud.

Los equipos electrónicos son constituidos por una gran variedad de materiales, algunos preciosos como el Oro y la Plata pero también grandes contenidos de materiales tóxicos. Por mencionar algunos ejemplos, en las tarjetas de circuitos podemos encontrar plomo (en soldaduras), mercurio (en switches y relés), así como retardantes de fuego con altos contenidos de bromo, mientras que en dispositivos como smartphones encontramos cadmio, berilio, cromo o arsénico, de los cuales se ha demostrado que se acumulan en el cuerpo y medio ambiente. También tenemos que los cables (generalmente recubiertos con PVC) contienen aditivos tóxicos para la salud (Fig. 1). De los casos más críticos son los *displays* de CRT (monitores de computadoras por ejemplo) que pueden contener hasta 2.2 kg de plomo, las pantallas planas actuales han mostrado niveles reducidos en plomo, sin embargo muchas usan lámparas que contienen mercurio.

Tomemos como base lo que sucede en IBM, empresa productora de componentes. En un análisis se asegura que "los trabajadores que fabricaban chips para computadora tuvieron un 40% más de abortos involuntarios y fueron significativamente más propensos a morir por cáncer de hígado, cerebro y leucemia, así como efectos negativos en el IQ de sus hijos"[2], información importante para darnos una idea de la magnitud del daño provocado por la exposición a los desperdicios electrónicos.

¿En dónde termina toda esta basura electrónica?

El producto llega a nuestras manos, lo utilizamos durante algún tiempo y eventualmente será reemplazado por un producto nuevo o se volverá obsoleto, posteriormente pasará a algún cajón de electrónicos en desuso y finalmente terminará en la basura. En este momento nuestro producto ha pasado a formar parte de depósito de desechos electrónicos. En este caso los tóxicos mencionados con anterioridad comienzan a depositarse en los suelos, mantos acuíferos y eventualmente regresan a nosotros, teniendo un fuerte impacto en nuestra salud.

Fig. Ejemplo de la combinación de desechos típicos en una oficina.

Según la IEEE (Instituto de Ingenieros Eléctricos y Electrónicos por sus siglas en inglés), uno de los destinos más comunes de los desechos electrónicos es el comercio no regulado de desechos, éstos son enviados a países pobres donde las regulaciones para desechos electrónicos son precarias o inexistentes y la mano de obra es barata. China recibe actualmente el 70% de los desechos eléctricos y electrónicos del mundo y ha desarrollado una enorme industria irregular del reciclaje. Los resultados han sido dramáticos, la ciudad de Guiyu cerca de Hong Kong es conocida como la capital mundial de los desechos electrónicos y es una zona de desastre ecológico. Los trabajadores queman tarjetas de circuitos para recuperar chips y las bañan en ácido para extraer oro, los residuos del proceso son arrojados al río Lianjiang. También rompen CRT's con martillos para recuperar cobre de ellos. Estos métodos rudimentarios arrojan cantidades excesivas de mercurio, cadmio y otras toxinas en el ambiente, el resultado de esto es que alrededor de un 80% de los niños en Guiyu sufren de envenenamiento por plomo. La misma situación se repite en India, países en África y otros países en vías de desarrollo.

Muchos esfuerzos han sido conducidos para regular el comercio de desechos tóxicos, sin embargo la corrupción, mala interpretación de las regulaciones y el fraude han alimentado ésta práctica. Y es que el hecho de que en los Estados Unidos o la Unión Europea reciclar una computadora apropiadamente cueste 30 dólares comparado con los 2 dólares que costaría hacerlo en países pobres hace que haya mucho interés en el comercio ilegal.

Las soluciones al problema global de desechos eléctricos y electrónicos

Es un hecho que, las estrategias de mercado que rigen a la industria de los electrónicos y eléctricos no son lo mejor para el desarrollo sustentable, así como las estrategias de reciclaje no son suficientes ni bien conducidas y falta mucho en materia de regulaciones, por otro lado, el diseño de los componentes y ensambles electrónicos tendría que tomar un enfoque diferente para habilitar el reciclaje masivo, entonces, ¿cuáles son las soluciones que hay al respecto?

La solución que ataca a todos los problemas anteriores es la llamada "Responsabilidad Extendida del Fabricante" o "Recuperación del producto". Esta involucra un diseño del producto considerando no sólo el tiempo de uso sino todo el ciclo de vida del dispositivo, tomando en cuenta también el fin de su vida y reciclaje (Fig.2). Durante el diseño con responsabilidad extendida del fabricante, se busca reducir los niveles de material tóxico en el dispositivo, hacer los dispositivos más durables y fáciles de reparar así como diseñar para facilitar su reciclaje, por ejemplo, con el uso de diseño modular en el que se pueda cambiar solo una pieza dañada u obsoleta en vez de cambiar todo el aparato, permitiendo así el reacondicionamiento para su reutilización.

Fig.2. Muestra de la contaminación de RAEE en tiraderos a cielo abierto.

Ésta estrategia contempla como factor principal el hecho de devolver el producto ya sea al fabricante o a una entidad de reciclaje certificada y aquí es donde entra el tema de la **Reutilización y Reciclaje de Artículos Electrónicos** (RAEE). La idea es que el fabricante deberá diseñar el producto para su reciclaje o reutilización total o parcial reintegrando así los componentes al ciclo de un producto nuevo.

Existen hoy en día programas de recuperación de productos eléctricos y electrónicos. Muchas compañías fabricantes ya están implementando estos programas, es así el caso de Apple, Dell, Hewlett Packard, Sony y Toshiba; algunas de ellas solicitan un cargo de retorno y aplican algunas restricciones, sin embargo, los primeros pasos ya se están llevando a cabo y el resto es cuestión de conciencia en la gente. Algunas compañías aceptan productos de cualquier marca mientras que otras sólo aceptan sus propios productos. El destino de estos desechos es ser completamente reciclado o al menos reacondicionado para otro uso.

Por otro lado existen los programas de recuperación de productos con recicladores legítimos de desechos eléctricos y electrónicos. Estos procesos usan complejas máquinas de reciclaje que trituran los electrónicos y los llevan a una banda transportadora donde mediante pantallas vibradoras y campos magnéticos se extraen los diferentes elementos, otra forma comúnmente usada es por medio de mano de obra (usando el equipo de protección personal adecuado), donde trabajadores en una línea de desensamble son quienes clasifican los contenidos. Todos estos métodos son más comunes en Europa que en el resto del mundo.

Rentabilidad detrás del RAEE

Hasta este punto sabemos que la reutilización es factible desde el punto de vista ingenieril, sin embargo es un hecho que si no es rentable las grandes compañías no lo contemplarán como una opción viable, y a menos que la implementación forzosa de planes de acción por parte del gobierno se lleve a cabo (lo que conduciría a otros problemas de rechazo a la norma), es necesario que haya también un beneficio económico o al menos una pérdida mínima detrás del desarrollo sustentable para que este sea bien adoptado. Lo impresionante es que las cifras indican que la reutilización y el reciclaje es una industria millonaria y con enormes expectativas de crecimiento.

De acuerdo con la Asociación Europea de Recicladores de Electrónicos (EERA por sus siglas en inglés), tan solo en Europa la industria del reciclaje alcanzó el valor de mil millones de dólares en el 2007, empleando alrededor de 10,000 personas con un variado rango de disciplinas: ingenieros de proceso, químicos, representantes de ventas, clasificadores y despachadores entre otros. La EERA también establece que de implementarse por completo las normas europeas actuales la industria crecería hasta 25,000 empleos.

En Estados Unidos el problema no es la falta de procesadores, sino la falta de volumen, resulta que existen unos 1800 procesadores de desechos electrónicos entre Estados Unidos y Canadá, con o sin fines de lucro, trabajando aproximadamente a un 70% de su capacidad donde ninguno de ellos opera 24 horas por 7 días De acuerdo con Jerry Powell, editor de Resource Recycling, la industria del reciclaje de electrónicos en Estados Unidos tiene un valor estimado de entre 2 y 3 mil millones de dólares (Fig.3.).

Fig. 3. Símbolo alusivo que involucra el reciclado de RAEE.

Existen incluso ya ejemplos de compañías multinacionales que han surgido a partir de la industria del reciclaje de electrónicos, tal es el caso de Sims Recycling Solutions, una compañía con base en Australia y actualmente el procesador más grande de desechos electrónicos. Sims tiene actualmente 30 sitios a lo largo del globo procesando aproximadamente 400 toneladas anuales de desechos y empleando a unas 5 mil personas, la industria de la recuperación de electrónicos ha tenido tal crecimiento que basta con saber que Sims Recycling Solutions fue creada apenas en 2002.

Entonces, es un hecho que la industria del reciclaje es rentable y de hecho resulta ser un fuerte motor económico para los países desarrollados así como una importante fuente de empleo para mucha gente, el siguiente paso, es la creación de regulaciones que obliguen a los grandes corporativos a implementar estrategias masivas de reciclaje.

El Marco Normativo del RAEE

El intento más significativo para encarar el problema de los desechos eléctricos y electrónicos es la directiva Europea de Equipo Eléctrico y Electrónico, mejor conocida como WEEE. La directiva incluye en su interés, tecnologías informáticas, tecnología de comunicaciones, electrónicos de consumo y herramientas eléctricas. La filosofía de WEEE se basa en la premisa de poner la responsabilidad del manejo de desechos electrónicos y eléctricos a los fabricantes, importadores y vendedores. Las compañías están obligadas a implementar programas de “Take Back” o recuperación de productos electrónicos al final de su vida y deshacerse de ellos de manera ecológicamente responsable o rehabilitarlos. Implementada en 2004, los resultados de esta directiva son un porcentaje aproximado de un 30% de reciclaje de eléctricos y electrónicos dentro de Europa. Se dice que el punto débil de esta iniciativa es el costo de implementación que, aunque es incierto se dice que es muy elevado, sin embargo los analistas de la industria dicen que independientemente del costo esta directiva será un modelo de legislación en el resto del mundo, de hecho ya ha sido adoptada por China y posiblemente continúe la India.

En Estados Unidos no se ha aplicado aún una normativa a nivel federal. Actualmente las regulaciones varían entre estados, condados e incluso ciudades, lo que es una realidad es que en varios estados se han implementado programas voluntarios en donde las marcas aceptan los electrónicos de los clientes comprometiéndose a su reutilización o en su defecto el reciclaje apropiado de los dispositivos.

En México se producen unas 300 mil toneladas de desechos anualmente, donde aproximadamente un 1% corresponde a desechos electrónicos. No existe como tal una normativa para la reutilización y reciclaje de eléctricos y electrónicos, así como tampoco hay un registro de recicladores certificados por la SEMARNAT. Si bien hay mucho camino por delante en materia de legislación también es cierto que hay muchos programas independientes de las compañías fabricantes para hacer frente a esta situación. Tal es el caso de la compañía Apple con su iniciativa "Green Day" que, según el diario El Porvenir, esa compañía, en conjunto con Proambi -una empresa particular líder en el sector de reciclaje- darán un "bono verde" de entre 700 y 4,000 pesos (dependiendo del artículo donado) de descuento en la compra de un iPod o una computadora. Se trata de la cuarta edición de este evento que se hace una vez al año.

Conclusión

Las cifras y los hechos son preocupantes, queda mucho por hacer; sin embargo se cuenta con todos los factores para llegar a un punto donde la industria electrónica sea sostenible. Hay una industria millonaria, generadora de empleos y además con una muy buena causa esperando a que cada persona haga conciencia. Ahora el turno es personal al tratar de colocar cada producto en el lugar adecuado para su reutilización o reciclaje, también se debe exigir a los fabricantes más conciencia ambiental y en el papel de consumidor, tomar en cuenta el manejo durante la vida del producto como un importante factor en cada compra. Se debe exigir a nuestras cámaras legislativas regulaciones claras con respecto al manejo, reciclaje y reutilización de desechos eléctricos y electrónicos, así como la implementación de centros de reciclaje autorizados para contar con un lugar para terminar la vida de los aparatos eléctricos y electrónicos.

El problema no es la tecnología, pues la reutilización y reciclaje ya son una realidad, tampoco es la rentabilidad, pues se ha demostrado que es una industria económicamente sostenible, tampoco son las compañías pues ya han dado los primeros pasos en materia de programas de regreso de productos. El problema es la apenas incipiente cultura del reciclaje, y ahí es donde tenemos que cambiar nosotros si queremos dejar un mundo digno y limpio a las futuras generaciones. Se podría decir que en materia de reutilización y reciclaje de dispositivos eléctricos y electrónicos se tiene una gran oportunidad y que se puede tomar como una opción interesante para proponer alternativas que generen desarrollos en el ámbito tecnológico, para un mejor bienestar.

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