

# Attacking Material Consumption

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## Abstract

Immaterialisation of consumption is distinguished from Dematerialisation of Production; each is derived from decomposition of the master equation for ecologically-defined sustainability. From the work of the ASSIST<sup>2</sup> study, immaterialisation is described in some detail and the differing development trajectories; and differing responses to rebound effects, of immaterialisation and dematerialisation are distinguished. Socio-economic determinants of immaterialisation are expanded, including needs and satisfiers; behaviour and values; and lifestyles. The place of brands in demand management is discussed. From these elements of taxonomy, potential routes to the creation of new immaterials are described, with the addition of awareness of the general indirectness of substitution. The conclusion is reached that immaterialisation is a necessary complement to dematerialisation which should now be developed further.

## 1. The Need for Immaterialisation

### 1.1 Introduction

It would, of course, be quite wrong to suggest that the quest for eco-efficiency has achieved its objectives, but it does seem reasonable to describe it as an issue approaching maturity, with a clear overall vision of what is to be achieved and with a good range of tools available to facilitate the achievement of high levels of dematerialisation of consumption. The immaterialisation of consumption (a quite different issue) is a much less mature topic than the dematerialisation of production, but it is acquiring a new prominence that necessitates a careful examination of its potential.

In a speech to the European Policy Centre in September 2000, Commissioner Wallstrom said this :-

"The most difficult challenge that I can see is how to change behaviour - the behaviour of all of us as consumers, transport users and tourists for example. The fact

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<sup>2</sup> ASSIST is an accompanying measure in the E.C.s Fifth Framework IST programme.

is that after we have made progress in controlling emissions from industry, power generation and at least some products, environmental pressure is caused more and more by the ways in which we live and consume.

Environment policy-makers therefore need to win acceptance of the need for changing our consumption patterns - and in some cases for consuming less.

For politicians this is not an easy message to give. It is a necessary message though, and I am convinced that many people do not even have to be told. They know that our lifestyles are not sustainable in the longer run. The important thing is that message must not be one of gloom. I am not arguing that environmental progress should make us all 'kill-joys'. Trying out new ways of travelling, of reducing ones household waste and of saving energy can simply be fun. And this is what we have to communicate.

However, companies respond to the market, and creating a competition in the marketplace that values environmental performance is therefore critical. Labelling and economic incentives will help this green marketplace to emerge. This in turn will challenge the ingenuity of people in business to come up with new solutions that benefit the environment. It will also enable consumers to adopt greener lifestyles.

Changing the marketplace is clearly one of our main challenges."

Although wisely avoiding the clumsy and off-putting terms "immaterialisation" and "dematerialisation" , this section of commissioner Wallstrom's speech identifies the importance of, and the key elements of difference between, the two approaches to the reduction of material consumption. The time has come to investigate the implementation of immaterialisation of consumption as a way to supplement existing efforts on the dematerialisation of production.

## 1.2 Relationship with sustainable Development

It is always necessary to be circumspect when discussing sustainability : the term is quite legitimately used in many different ways for many different purposes. One well established conceptualisation that is widely supported is the Total Environmental Stress approach to ecologically - derived sustainability developed by Professor Malaska and his colleagues at the Finland Futures Research Centre at Turku. In this approach, the master equation  $I=PAT$  (due to Ayres<sup>3</sup> and others) which links Total Environmental Stress, Population, Material intensity and Economic Activity, is decomposed<sup>4</sup> to produce the "four strong requirements" thus

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<sup>3</sup> Ayers Robert (1978) Resources Environment and Economics, New York, Wiley; ISBN: 047102627

<sup>4</sup> Kaivo-oja, J; Luukannen J; & Malaska P Advanced Sustainability Analysis Turku (Finland) 2001

- Dematerialisation of Production
- Immaterialisation of Consumption
- Annihilation of Rebound Effect
- Long Term Population Control

It is the second of these "four strong requirements" which is now due (or perhaps overdue) for critical appraisal.

### 1.3 The Case for Immaterialisation

We may take it as read that there exists a general need to restrain or reduce material consumption, whatever the philosophical or political view being taken of sustainable development. There are two quite different classes of action which may be taken to do this (ignoring, for the purpose of this argument, the obvious third option of reducing global population). One may use materials more efficiently: this we call the dematerialisation of production. One might equally contrive to consume less *in toto*: this we call the immaterialisation of consumption. Self-denying ordinances and sumptuary laws have had this latter goal for thousands of years, with relatively little effect, so we may take it that human nature tends to resist this principle. The new technologies of the Information Society, however, offer the potential to succeed where sumptuary laws failed, because, to quote Commissioner Wallstrom again, "the message is not one of gloom". The possibility arises that, through appropriate uses of information society technologies, we might produce large sustainability benefits whilst simultaneously satisfying people's needs as well as, or better than, before. The proposition lacks the obvious immediate accessibility of the proposition that we might use materials more efficiently, but its greater difficulty of attainment is at least partially offset by certain unique benefits.

### 1.4 Differing Development Trajectories

With dematerialisation of production (which we might also call eco-efficiency) the degree of difficulty of attainment rather clearly becomes exponentially more difficult with the increasing degree of achievement of dematerialisation. The 99<sup>th</sup> percent of dematerialisation is going to be almost infinitely more difficult to achieve than the 1<sup>st</sup> percent. In practice, therefore, the growth curve of dematerialisation will quickly flatten out and become asymptotic to the maximum realistically attainable eco-efficiency for the specific area considered. Immaterialisation, on the other hand, builds continuously but slowly, without any levelling-off effect.

One would expect, therefore, that the combined growth trajectory of the two would initially be dominated by dematerialisation, as the first quick-and-easy gains are taken. Later, however, immaterialisation will dominate as the gains of demateria-

lisation become ever harder to extend. This leads quite naturally to the view that we should first implement the quick-and-easy solutions of dematerialisation (it would be positively bloody-minded not to do so); but that in the longer term immaterialisation must necessarily be fully explored if continued increase of benefit is to be achieved.

### **1.5 Rebound Effect**

General rules concerning free lunches are well known, of course; add in the tendency for many actions in sustainability to produce results which are counter-intuitive and you have an approximation to the rebound effect.

The rebound effect is well understood in the context of dematerialisation of production, where increasing eco-efficiency tends to reduce unit costs, which then leads to increased usage and so counteracts the benefit. Some such effects have been observed with early manifestations of immaterialisation, particularly in telework. In the case of telework the anticipated reductions in travel seem not to have happened, and indeed there is some evidence that travel can actually increase (although the data is thin and not always convincing). The rebound effect is less clear here, however than it is with dematerialisation. If travel is being immaterialised, less travel will occur. Clearly, if more travel occurs, there has been no immaterialisation. This could be said to be a different class of rebound from that occurring in dematerialisation. The rebound effect is a complex offset to success in the case of dematerialisation, but it is a simple negation in the case of immaterialisation. In the latter case the answer is demand management, and this concept lies at the heart of the immaterialisation of consumption. The point to be taken here is that immaterialisation is a demand-side activity, and that the management of demand is central to it.

## **2 Understanding Consumption**

### **2.1 Needs and Satisfiers**

At first glance it appears that both demand and consumption should be well understood subjects. Governments produce endless statistics on production and consumption, so that we have a strong statistical picture of both (although we seem to know a good deal less about wastage, indirect material use, despoilation and pollution). At the individual, anecdotal, level we all experience consumption; there can be few who have never remarked on the folly of what others consume; and many of us will have observed (at least in others) what a remarkable small proportion of our consumption it is that serves any apparent useful purpose. One outcome of recent upheavals in the UK's troubled and old-fashioned agricultural sector has been the widespread, if belated, acceptance that agriculture accounts for only 1% of the UK's

G.D.P. That should lead us to wonder just how extraordinarily low a proportion of all economic activity would account for all of our basic physiological needs - 5% perhaps? Certainly less than 10%. This should lead us to enquire more about the remaining 90% - why do we consume all that 'stuff'? Our good understanding of the 'what' of consumption is accompanied by much unknown or disputed territory in the 'why' of consumption. If we are to attack material consumption by the use of immaterialisation, there is a clear need to understand the enemy. Just why do we consume that 90 or 95% of all consumption that is not related to physiological needs?

The sumptuary laws of the Renaissance period were aimed at what we would now describe as luxury consumption. However, luxury consumption in the Renaissance was still only a trivial part of all consumption: today, nearly half of all global consumption is the responsibility of that tiny proportion of the world's population whose income exceeds \$100,000 per annum. Such statistics tell us little from an operational point of view, but do at least indicate that the potential for immaterialisation is very large indeed. It may also provide a pointer as to the likely "soft spot" for immaterialisation to attack first, that is the "luxury" market.

There is a considerable body of socio-economic research on consumption : "needs" are met by "satisfiers" in sociological theory, whilst in micro-economic theory "values" inform "behaviour", concepts which have clear parallels with "needs" and "satisfiers". Remembering that immaterialisation is a demand-side effect, we can bundle all of these socio-economic factors into something we might loosely describe as a lifestyle. An aspirational lifestyle is an agglomeration (albeit perhaps one of many) of needs mediated by values; an achieved lifestyle is the agglomeration of the satisfiers (often apparently very partial) of those needs mediated by our behaviour. There may, of course, be a yawning gulf between aspiration and achievement, just as achieved satisfiers may be only obliquely related to needs, and actual behaviour only linked with some difficulty to values. Post material lifestyles have previously been recognised as significant in the context of creating immaterialisation; dis-aggregation of such lifestyles into their component needs (with the accompanying, if often unrelated, disaggregated satisfiers) (and ditto for values and behaviour) is therefore a potential step on the way to understanding the immaterialisation of consumption.

## **2.2 Lifestyles, Brands, and Demand-Management**

The concepts of needs and satisfiers; behaviour and values; and lifestyles are already well understood by large and sophisticated corporations supplying brands : our needs are recognised by those brand sellers as complex and as having as much to do with lifestyle aspirations, dreams and fantasies as they do with mundane realities. Buy the dream, they say, so we do; albeit that the product in no way fulfils the

dream. Brands provide both a strong pointer to the scope for introducing immaterialisation, and a foretaste of immaterialised society.

Demand management is by no means new, even as a formal concept. Everyone with something to sell is attempting positive demand management; in negative demand management, sumptuary laws date back to the 15<sup>th</sup> Century and possibly beyond; and taxation and excise which manage demand as well as providing revenue, have long, if not always reputable histories. Direct use of demand management to impact material consumption is visible in the means used to counter the Great Depression in the U.S. The intention then was just the opposite of today's, which makes the situation all the more interesting. The huge increases in manufacturing capacity of the 1920s (often quoted as a ten-fold increase, and assuredly very large indeed) were far in advance of the willingness of consumers to increase their rate of consumption: culture, as usual, did not change as rapidly as technology. The term first used for the outcome required from demand management was 'Creative Waste': mechanisms (the annual model change, for example) were adopted that would lead to greatly increased material consumption. The policy eventually came to be known as planned obsolescence: it is still widely prevalent in some consumer-product industries. It worked, all too well: but what can be achieved as a conscious policy can be un-achieved in the same way. Having consciously chosen to waste in the 1930s, surely we maybe now consciously choose not to waste.

The old giants of planned obsolescence in 'consumer durables' still exist, but they mostly no longer play such a leading role as they once did. The new leaders of commerce are the brand companies, selling not products but lifestyles and dreams. This is the opposite side of the coin: what is being sold by such companies is largely immaterial, and the management of demand is being used to reduce material consumption (by diversion of discretionary spending capacity) rather than to increase it. Material use in this context simply reduces the brand companies' profits without increasing revenues - a very desirable trap from a sustainability viewpoint. Brands offer us the encouraging view that demand management can be used in favour of sustainability; ISTs offer the potential to extend brand operation into areas of full immaterialisation.

### **3 Facilitating the Post-material**

#### **3.1 Creating Immaterials**

Writers' block describes the phenomenon of facing a blank sheet of paper with the brief only to be creative. It is a quite insufficient term to describe the specific void that would be produced by facing a blank sheet of paper with the brief to design an immaterial product or service, and still less sufficient for the difficulty faced in justifying the decision to invest in such development. Many questions about the real-

term development of immaterials reduce to a single problem : how might the C.E.O. and board of a large corporate be persuaded that it was worth allocating precious resources (including the most precious of all, senior management time) to the development of products and services that will substitute for material consumption. Can such immaterials be competitive - and if so, in which sectors and for what markets? These questions are less daunting than they seem, because the situation in reality is that the sheet of paper is not blank, but has some faint outlines already visible. From a taxonomy of the possibilities of immaterialisation, populated with early manifestations; and with the benefit of existing material design methodologies it should be possible to create a viable methodology for the design of immaterials.

Among the manifestations already visible, albeit very faintly, we have some early indicators of post-material lifestyles available to us from a number of research studies<sup>5</sup>. Rather fortunately, it is the case that the section of society most reviewed in lifestyle studies is also that same predominantly western, educated, Information Society connected, affluent group that accounts for the vast bulk of all material consumption; it is also again the same sector that might be expected to be the most accessible to the adoption of new immaterial products and services.

Generational issues arise here : there is now an Information Society Generation which is economically substantial although (probably) not yet economically dominant. The Dot Com business generation seems to have reached a sort of clumsy teenager phase - awkward, breaking things, alternating between hyperactivity and collapse, but very open to radical change in lifestyles. The potential for large societal changes surely exists.

We also have some early indicators of the likely nature of the new immaterials : we have some existing products and services that might correctly be described as "immaterialised" rather than as strictly immaterial, in that they have developed by analogy from existing material products and services. The infotainment industry is rich in immaterialised examples (in music; video; and in games) and it is there that we should perhaps look for the first genuinely conceptually new immaterials.

### 3.2 The Indirectness of Substitution

Immaterialisation of Consumption necessarily implies some form of substitution, i.e. of the immaterial for the material. This substitution clearly operates on the demand (consumption) side: in effect, the consumer must choose to consume something else, i.e. to divert her or his discretionary spending power to some other use. The substitution is necessarily indirect (direct substitution would be of one material thing for another equivalent material thing): the mechanism of diverting discretionary spending

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<sup>5</sup> A number of such studies are summarised in "The Good Life" (1998) Christie and Nash (Eds), Demos, London, ISBN 1 898 309 06 X.

power should alert us to the likelihood that the substitution may be very indirect indeed. A current example of highly indirect substitution is providing by changing fashions in the teenage market, where the existing fashion for trainers (already itself partially immaterialised by branding e.g. NIKE) is in course of being superceded by a newer fashion, that for text messaging. This example typifies many aspects of substitution: it occurs in a volatile, IST-sophisticated market; it is a highly indirect substitution with no apparent causal linkage; that which is being substituted is not totally material (Nike has a substantial 'buy the dream' content); the substitute is not totally immaterial (although the 'extra-over' material usage caused by text messaging is genuinely trivial), and finally it is somehow intellectually unsatisfying and inelegant as a solution. Text messaging (which we might think of as somehow "Beyond the Post Card", just as email is "Beyond the Letter") can be placed into a general taxonomy of immaterials. This taxonomy has socio-economic elements as described above, and also has IST (technological) elements such as the "Cycle of Cognition"<sup>6</sup>. Some further examples exist with which to populate the taxonomy (transport demand management - "Beyond the Car"; telework and CSCW - "Beyond the Office", and so on). From this initial population of a taxonomy it will be possible to infer the existence of yet further classes of immaterial substitution.

### 3.3 Conclusions

It is possible to take a preventative view of sustainability - the 'crash barrier' concept of avoidance of particular risks. Dematerialisation of Production responds very clearly to the crash barrier concept. It is also possible to take a more positive view of sustainability, as a challenge to human ingenuity to be met with new responses enabling something like continuous growth within the framework of finite resources. Immaterialisation of Consumption responds clearly to this human ingenuity concept. Understanding the differences between the two classes of response, and the particular characteristics and benefits of each, is a necessary prerequisite to the creation of a full programme of actions promoting sustainability (and/or avoiding the effects of unsustainability).

Within this twin-track approach, the greater accessibility of dematerialisation of production has rightly led to concentration on that. The new technologies of the Information Society (and also the increasing maturity of dematerialisation) should now lead us to give more attention to the use of the Immaterialisation of Consumption as a tool with which to attack the problem of excessive material consumption.

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<sup>6</sup> Leever D (1999); Digital Convergence at the User Interface; in European Journal of Telework Volume 6 Number 2.