

Chapter 6

Services and Consumption

*The archetypical over-consumer is the North American. He consumes his own weight every day: eighteen kilograms of petroleum and coal, thirteen kilograms of other minerals, twelve kilograms of agricultural products and nine kilograms of other products (. . .). At the other end of the scale we find the **Marginalen** at 1.5 kilograms per capita (. . .). This means that the North American is equivalent to thirty-four Bangladeshis. (. . .) In that case the United States has a population of seven billion Bangladeshis and Bangladesh has about five million North Americans. Where is the over-population?*

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Interlude: of electric drills, lawn mowers and service provision

Industrial products are really only needed when they are also used. To use means to derive utility or to obtain a service. In this light, we could perhaps argue that people do not buy products so much as they acquire service delivery machines. This is true for the shower, as it is for the automobile, the washing machine, packaging, the electric drill or the refrigerator.

In order to obtain a service, one needn't own the product outright. Most people do not buy an airplane to go on their next vacation. But many people wish for an electric drill for Christmas, even though they rarely use it either. If one out of every fifteen people in Germany owns such a drill, then more than 10,000 tons of the highest quality material was "locked up," not to mention twenty times that amount in consumed environment that was transformed, before the product could be bought in the store. If the belief in never-ending material growth turns out to be true, then many people probably will own private planes in the near future--if enough room remains in the skies, and the biosphere has not already begun to eliminate the great inventor by that time.

Now let us take a look at the lawn mower. This machine costs somewhere between \$100 and \$2,500 new. When purchasing such a tool, one has an immense selection: with a gas engine, an electrical engine, with no engine, a push mower, a lawn mower tractor and with or without various other frills. The name of the machine goes a long way toward helping us understand what it is good for: you can cut off the top part of the grass with it. Sophisticated models even collect what was cut off. In most latitudes it is used anywhere from five to twenty times a year. After a while, we go out and buy a new mower. This happens maybe five to ten times over the course of a lifetime.

One could approach the situation differently, though. We could begin with the question as to what we are trying to achieve, how much of it and why? Which service need are we satisfying? In the case of the lawn mower that should be pretty simple, no? Maybe not.

Do we want a lawn as smooth as a rug because we like to practice our golf there? Because we don't like weeds; because that is the way our parents did it, or because we think the neighbors expect it? Is physical exercise important or is it perhaps because we really want to impress the Jones's next door with our new tractor? Which service delivery machine would be the most appropriate?

Or should we perhaps not buy one at all? Perhaps it would be cheaper and better for the grass if we paid a contractor to do it for us. A call is all it would take. The repair, maintenance, storage and insurance would all be included in the price. But maybe the "zero-option" is the best after all: letting the grass grow, because wildflowers are pretty too--at least into the fall?

You might think this is not an example from which to generalize. Well, what else would we have a hard time parting with? The car? The refrigerator, washing machine, computer, VCR, electrical kitchen knife, detergent, having a car telephone or a private fax machine? What about the house?

What about trying it out? Before we buy the next object, let's ask ourselves exactly what service we want/need, how much of it, when and for what purpose? Let us compare, for

the sake of the argument, our present service delivery machine automobile with the actual transport and mobility needs of the family. How great is the difference between what the machine can do and what we need, or for that matter, what is possible in traffic? When was the last time we actually drove ninety-five miles an hour to work, to get groceries, or to the dentist? The speed limits in residential areas and in the city are between twenty-five and forty-five mph, and the average speed is actually a lot lower, sometimes under twenty miles per hour. How often are five people in the car? How many hours a day does the car do what it was built to do, provide transportation? The insurance, the liability, the expense of having a garage are costs spread over all twenty-four hours of the day. And if we park on the street then we are subsidizing ourselves through our taxes--streets are extremely expensive. What does it cost per mile--the out-of-pocket expenses? Fifty cents, a dollar? In any case it is about 400 grams of environment that we use for each kilometer we drive--from cradle to cradle.

Should we perhaps not own a car at all, but rather rent or lease one? Maybe a one or two-seated City-car for the week and a bigger one for weekend travelling and vacations? If we were to drive only half as much as we do today, a taxi would be cheaper--assuming we haven't bought the car on credit. Because in that case the taxi becomes even cheaper! Is something sold on the market today that meets these needs? Probably not, at least not for an appropriate price. But why? The market economy should be able to handle that, no?

We hear much talk about necessary structural changes, and well we should, if our great-grandchildren, as well as those who today still live in abject poverty, are ever to enjoy meaningful, not to mention necessary things. Ecological structural change will not occur unless we ask ourselves daily what it is that we really want, what we really need, for what purpose and why.

Aside from a few basic needs, humans only need services. The fact that these are generally met with machines, equipment and facilities may simply be due to a lack of imagination.

We have to stop wanting to buy the car, the toys, the kitsch on vacation, the house, or the appliance simply because they exist, because it is "in," or because we believe that we can meet our service needs only with these things. They are all developed and produced without the slightest regard for the prevailing ecological conditions. We have to get used to re-thinking our desires every time we are tempted to buy a piece of equipment or a product, or want to enjoy a service, especially if we can easily afford it. In almost every case they use up more environment than would be necessary to fulfill our needs.

To use and use up less than we have been is in every respect an ecological plus. This is also true for energy. Industry has a long and exciting time ahead of it in which to come up with products that meet our service and product needs in a more ecologically cautious way than has so far been the case. This is the foreign trade market of the future! We need to think about some other things in this context. For instance, whether objects like cars must necessarily be understood as private property (most belong to the banks anyway); what an ecological measure might look like with which to actually compare similar goods and services; whether we can skirt the issue of market prices speaking the ecological truth.

What are services?

Most people think of the work done by a janitorial crew or in a garage, in public transportation, in insurance and business consulting, the work of a nurse or a hairdresser. In short, they think of the services performed by some people for other people. Services would thereby include all work that is concerned not with the production or manufacture of a tangible object, but with helping, consulting or organization. We begin to notice that services are rendered by machines as well, when we get upset with the ticket machines for the subway, because they function differently in every city. We can even get money out of our bank account at midnight--from a machine.

The term "service" is also used in the context of products, for instance in connection with energy. The environmental movement popularized the demand that energy suppliers or public utilities become energy service providers. Here the term is expanded in a way we wish to adopt for the term MIPS as well. Products such as electricity, cars, kitchen appliances or a mouse trap provide services; they meet our needs. They are in every respect "service delivery machines." We in fact buy most products solely because we expect a service from them. We don't really need electricity, rather we need a means for keeping our groceries cool, a way to cook, or to read after dark. We don't need a car, but transport or "mobility" (whatever that means); we don't need a mousetrap--we want to catch mice. In short, we don't need a product, but the service it can provide. Exceptions exist: jewelry and art prints are bought for the enjoyment of beauty and as investments. Clothes, perfumes and sometimes even cars are bought for their status value. But even products that elevate our social status thereby perform a service.

At first glance it appears as if we had merely replaced the conventional terms "good" and "product" with "service," but it is not quite that simple. For one, the way we are using the term "service" permits a comparison between goods and services by referencing the service capabilities of a good. This way it becomes possible to compare the service "subway ride" with the good "automobile." This is important for the second reason, that it leads the environmental discussion out of the pointless debate over "buying- or doing without." Environmentally benign behavior in the personal realm, and environmentally benign economics in the social realm may demand that we do without a product. But the renunciation becomes easier, it even becomes politically feasible, if the appropriate service can be obtained in some other, alternative way.

From this expansion of the term "service" it is only a small step to its use in a definition of the ecological significance of products and actions as we do with MIPS. There it manifests itself as the key to a better understanding of an environmentally benign economic system. Let us take a look at some examples.

Is an "eco-washing machine" better than one that does not carry this label? The manufacturer claims that the "eco-washing machine" uses less water, less electricity, and perhaps even less detergent. This is positive, and gives it an advantage. But if the "eco-washing machine" is heavier than competing models, if more electronics (themselves produced with great material effort) are hidden within, if ecologically valuable materials were used materials (requiring the displacement of large amounts of material and energy for their extraction), or if the machine wears out more quickly, all of this would register negatively in the eco-machine's Life Cycle Analysis. What is even worse, is that such heavy, material

intensive machines, whether eco- or not, are purchased and lugged into every household, even though they may only be used there once a week.

Other appliances and products fare similarly. The "eco-car" may use less fuel than a "normal" car. But the question is whether we want to use less fuel or whether we want take care of our transportation needs while minimizing the strain on the environment. Because in that case, the approach of the "eco-car" may be too short-sighted. Do we need a more efficient refrigerator or do we want to keep perishable groceries fresh? If one asks different questions, different answers suddenly become possible. We will be returning to ecological cooling at the end of Chapter 7.

The MIPS concept does not require arbitrary limitations on consumption because such consumption might be material intensive. It is a positive approach. Its mission is to encourage the search for possibilities of providing services which people demand, with alternative approaches that use less material.

If MIPS were to be accepted as a scale against which to compare environmental burdens, this would mean that any planned exchange of fossil fuels, automobiles, throw-away packaging, apartments, production methods, etc. for other solutions would only be ecologically more benign if less material were displaced in the process than today, calculated from cradle to grave.

To return to the examples from the beginning of the chapter: dematerialization means asking how five kilograms of dry laundry (the capacity of a normal washing machine) can be washed in the most ecologically sound manner. In this case, MIPS would be measured according to the scale "kg material flow per kg clean, dry laundry." In looking for an answer, one would have to consider the communal washing machine in the basement of an apartment building, the laundromat down the street, easily repaired machines as well as very durable ones. Dematerialization means cooling twenty cubic feet with as little ecological impact as possible, and keeping it at that temperature. Does this space have to be a portable refrigerator that can be put in a moving van? Dematerialization does not mean having to give up driving, even though certain limits on driving could very easily be a part of an ecological transformation, but rather looking for less ecologically damaging and more task-specific forms of transport. This could even be fun, to creatively find solutions. Cities could invite competition and award prizes. The comparative measure would be "tons of material flows per ton-kilometer transport service."

We repeat that reusing and servicing is not under all circumstances the most environmentally friendly option. Neither is a "zero-emissions vehicle" (which, by the way, does not exist and never will) or a modernized power plant always beneficial. It always requires additional material flows to reduce the emissions of a car or power plant, and sometimes the amounts are staggering. Besides, the fuel consumption (miles per gallon) is not necessarily a good or even an essential measure for the environmental burden associated with automobiles. The requisite MIPS can very easily be affected more by the material flows generated in the production and disposal of automobiles than those associated with their use.

All services require some hardware, but many services are necessary if hardware itself is to be of any use¹.

According to the classical definition, services are immaterial goods. It is apparent, though, that these immaterial goods can only really exist, that we can only derive some use from them, if equipment and machines exist that produce the services. A vacation trip is only possible if an airplane or a dogsled are available. Money can be had at the bank only if the bank has a place to keep the money out of the rain. Services always depend on real-life service delivery machines and always cost energy. Without an energy supply, without infrastructures, buildings and a list of other machines and devices we would not have a service sector.

From the ecological perspective, we must ask about the material and energy content that is hidden within a particular service, without which this service would not exist. This means that we must add up all material and energy effort from cradle to cradle. A day in a hospital for instance costs the following:

- the material and energy requirements for the construction, the operation, maintenance, upkeep and dismantling of the hospital including all ecological rucksacks, divided by all person-days "provided" by the hospital over the course of its operation;
- the total proportional material and energy requirements for the education, training and maintenance of the hospital personnel;
- the part of the consumption of medicines, equipment, lodging and energy, including all ecological rucksacks, that are necessary for treatment and care of a patient--per day.

It is well known that the financial costs of operating a hospital vary considerably between and within countries. The ecological costs are not known because no one ever bothered to add them up. But they are certain to vary somewhat as well.

The ecological costs of services can be altered from two sides: from the supply or from the demand side. As a vacationing individual, one can choose to stay at a nearby farm rather than flying to another continent, or, if one is bent on flying, one can stay there a little longer. On the supply side, the travel agencies could use the most energy-efficient equipment and facilities, both in their businesses as well as for the customer on his or her vacation. The hospital business could offer on-site treatment instead of residence.

Choosing the ecologically preferable

How is the man on the street to know how ecologically expensive or affordable a service delivery machine is? Information based on the MIPS concept is not available yet and the existing labelling is, as we have seen, not truly helpful. It will be difficult in any case, if not actually impossible, to make ecologically sensible purchasing or use decisions. Nevertheless we will try to put together a list of questions that might be helpful in discovering the ecologically preferable options. We have encountered some of these questions long ago, and others we have been using, whether consciously or unconsciously, for a long time. As already emphasized, one should first know what one is looking for. One should do a little soul-searching as to one's true needs, besides asking when, how much and why one wants the

object in question. The term "good" in the following list can mean anything tangible or anything that one can put to use, from a mousetrap to a house.

- How much material does the good require during its use? This can be fuel, detergent, lubricants, cleaning agents, water or other such substances.
- How much energy does it use during operation?
- How large is the good? Are smaller versions available?
- How much surface area does it require?
- How far and with what mode of transportation was the good brought here prior to my purchase?
- Is the packaging appropriate?
- Are parts of the good recyclable?
- How much does it weigh and what is it made of? This is one of the most important and also one of the most difficult questions to answer. Neither the seller nor the buyer usually knows the material composition of the good, and the ecological rucksacks are all but inestimable. How much recycled material or renewable resources are contained within the good? As functionally equivalent products are often put together similarly, the weight of two cars or two sewing machines can furnish a first approximation. One should not rely on this too much, however.
- Does the good regulate the flow of energy, detergent, or other substances electronically or by some other optimization process?
- Can the good be used for different purposes; is it multi-functional?
- Can it be used for other purposes or by other people once I have no more use for it?
- Can I lend it or rent it to others for their use?
- How durable is the good? How long is the warranty? A knowledge of the following characteristics helps in estimating the product durability:
 - surface qualities (potential for wear, easy to clean);
 - corrosion resistance;
 - likelihood of material fatigue;
 - reparability;
 - partibility/separability (for maintenance and repair);
 - ruggedness and reliability;
 - adaptability to technical progress. Products should be put together in such a way that individual parts can be exchanged for newer, improved ones (car engines or refrigeration units). This holds true not only for durable goods, but also for goods that can change very quickly such as computers.

This list is obviously much too long to be any fun, and your dealer will only know some of the answers. A MIPS-tip would perhaps be a lot easier, but if enough people persist in asking these questions things might begin to change for the better. In a market economy the customer is always supposed to be right, after all? In the next chapter we will discuss how these and many more questions can be incorporated into product design.

We should seriously consider the possibility of the following information appearing on all final goods: country of origin or production, the ecological rucksack (measured in

material input, MI), the energy intensity, MIPS (based on experience with the product or on extrapolations of the manufacturer's warranty), as well as the known pollutants that are found in the product or that can accrue during its use.

Growth, consumption and the future

By economic growth we usually mean statistically averaged growth in material objects which citizens can access and manipulate. More wealth means increased access to material goods in step with an increased amount of available cash. We don't need to go into the reasons why economic growth will necessarily lead to an ecological catastrophe.

Even if the world economy succeeded in a dematerialization through technical optimization of products and through maximizing resource productivity, this conception of wealth would foil all attempts to reduce global material flows by fifty percent of present levels. What is the use of having a City-car become the standard--a super-light vehicle, requiring low energy and material inputs in its production, while getting 250 mpg--if every family then goes out and buys as many of them as they wish? This would be merely a continuation of the present material intensive lifestyle, with the one difference being that everyone would have a clear ecological conscience. How should we deal with this rebound effect?

As long as economic growth and material wealth are equated in popular belief and behavior, an ecological economy will not be possible.

But is this link imperative? People in Western cultures seem to still need something like growth. They seek the feeling that life around them is progressing, that the world is not standing still. Does growth have to be material growth? As long as people are struggling for their daily bread, for protection from the rain and the cold, and for relief from sickness, the desire for more material comforts is an appropriate instinct. The majority of humanity today has not yet succeeded in transcending this state. But how and where does growth for the sake of safety and satisfaction turn into the Poverty of Affluence², as Paul Wachtel has called it? We keep coming back to the same premise: the rich will have to make do with one-tenth, and the rest of the world with one-half. Otherwise the system will collapse under its own weight and suffocate beneath its own trash.

The goal:

Dematerialization without a loss in the quality of consumption.

Must growth be sin? After all, this book is calling for a kind of growth, growth of ecologically optimized technology, growth in knowledge of the highly complex response mechanisms of nature to human intervention, growth of economic systems and consumption institutions that mesh better with the biospheric parameters. This list should already make clear that growth can exist which is not to be equated with monetarized appropriation of material resources and goods. The world can continue on its path without the need for an inevitable increase in the raw material throughput. If progress and growth advance in the ways we advocate in this book, then a reduction in the material intensity of our lives will

necessarily follow. Why, then, should an economy not grow in all sorts of ways, except in its appropriation of material goods? We are not prepared to put forth a concept for how such an economy should look.

Dematerialization alone will not suffice to make the economy sustainable. The eco-efficiency revolution remains inadequate and one-eyed if not accompanied by a sufficiency revolution. The zero-options must become more a matter of course. We must find better definitions of "use." All of this should become part and parcel of the political debate over ecological structural change. We need a new, a dematerialized conception of meeting needs. We will no longer be able to afford material goods in the future simply because we are able to pay for and produce them, not even if it costs us the "American Dream."

In light of this we should also scrutinize the different approaches to realizing ecological structural change. It is possible for productivity gains to be undercut by long-standing tax incentives encouraging the substitution of resources for other inputs. Raising taxes on the use of resources must be accompanied by a drop in income taxes, to pick up the inevitably resulting slack in employers cost-calculations. In countries where people are not struggling to meet their daily needs, the concept of consumption must shift away from material to immaterial things. Surely this development will only come about if children are raised differently than they presently are. This will have to start with the youngest children, who, although they have never seen a live chicken, cannot see out of their bedrooms for all their violent plastic toys, Nintendo games and Barbie dolls. This continues in the schools, in the tendency for curricula to emphasize quantitative subjects. Why should a nation benefit from teaching math, chemistry and economics over philosophy, music and painting? Listening to Beethoven or Tina Turner, visiting art galleries, playing ball or enjoying garden parties can be accomplished with much less harm to the environment than keeping millions of over-sized cars on the roads or organizing nationally televised car races³.

^{1.1} **Orio Giarini and Walter Stahel, The Limits to Certainty--Facing Risks in the New Service Economy. Dordrecht, 1993.**

^{2.2} Paul Wachtel, The Poverty of Affluence. New Society Publishers: Philadelphia, PA, U.S.A., 1983.

^{3.3} Considerable thought has already been devoted to parts of these issues: for example, see Reinhard Heinzl and Monika Zimmermann, Handbuch umweltschonende Großveranstaltungen--Leitfaden für Planung und Durchführung unterschiedlicher Veranstaltungstypen. Publication commissioned by the Umweltbundesamt in Berlin, 1990.