Social Loading and Sustainable Consumption

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Synopsis

The paper examines the social nature of energy and materials consumption, borrowing concepts from conventional energy systems analysis, including load, load dimensioning and load management.

Abstract

In this paper, the authors draw on concepts from conventional energy planning to examine the social nature of consumption. This understanding is crucial in light of new efforts to arrive at an understanding of sustainable consumption patterns and how to move toward realizing them. The concept of social load, both base and peak, is defined to help us understand how levels of consumption of energy and other materials are established in the household environment. Cases and examples are used to illustrate the meaning of social load. We show how social loads can be identified, and consider some of the ways in which they are assumed and estimated in the structuring of common household systems. Some of the important determinants of load in the home environment are drawn out, including status and display, sociality and conventionality, security and convenience, and embeddedness in systems and structures. We draw attention to the necessity of viewing consumption not solely as an isolated activity taking place at a point of «end use», but rather as a result of the interplay of multiple forces in society, including commercial actors, public policy, webs of organizational as well as regulatory action, advertising and distribution. We conclude with a discussion of the implications of this social perspective on consumption for both research and policy agendas.

1. Introduction

There is a growing recognition in international policy organizations (e. g., OECD, UN, Commission for Sustainable Development), and in some national research programs (e.g., U. S., Norway, Denmark, Netherlands) that the patterns and levels of Western-style consumption are not environmentally sustainable. There are also a number of nascent efforts to encourage sustainable consumption as well as to understand how changes towards sustainability might be undertaken. Our intention in this paper is to show how an understanding of the social dimensions of consumption is useful, even necessary, to efforts to make Western consumption patterns sustainable. We draw on some well known concepts from energy planning to illuminate those social dimensions, among them base and peak load. We use the load analogy to help us understand how levels of consumption of energy and other materials are established in the household environment. In section 2 we present cases to show how social loads can be identified, and consider some of the ways in which they are created in common household systems. In sections 3 and 4 we discuss the durability and determinants of social load. In chapter 5 we discuss the implications of this social framework for research and policy agendas.

First, we will borrow a few tools from conventional energy planning in order to help visualize the social nature of consumption. The most important of these are capacity and load factor. „Capacity" refers to the size of the system—i.e., how much electricity, gas or other form of energy can be produced when operating at full speed. „Load factor" refers to the relationship between actual loads on the system (total system demands) and capacity. A system is said to have good load factor when demands and capacity are closely matched, while poor load factor

means that capacity is often underutilized. The loads on an energy system vary of course by time of day, day of the week, and season of the year. A certain amount of energy demand („base load") can be assumed for much of the time, while relatively short term heavy demands sometimes add considerable „peak loads" to the system. [1]

So, the capacity of an energy supply system is driven by peak load, whether it be seasonal or daily. From an economic point of view, however, it is nearly always wasteful (and unprofitable) to build supply capacity that sits idle much of the time. From a societal point of view, resources that could be otherwise employed are diverted to the maintenance of little-used equipment—although it should be noted that „standby" capacity serves as insurance against breakdowns in the system as well as unusual, but real, societal demands for energy.   The environment also suffers from the building of unnecessary power plants, due to land use, air and water pollution, disturbance of local ecosystems, etc. «Load management» or «demand-side management» are terms for a general category of efforts to influence energy loads in order to reduce the economic waste and environmental consequences associated with meeting peak loads.

While many efforts to control or reduce energy loads have been managed by insightful practitioners, many others have solely stressed economic motivations, ignoring the social and cultural nature of consumption and consumer choice. As a result, their success has been limited (Stern 1986, 1992). There is a significant social scientific literature on sociocultural variability in energy use, energy and social cognition, cross-national studies of consumption, and related topics (for reviews of relevant research, see Stern and Aronson (1984), Lutzenhiser (1993), Arvola et al (1994), Shove (1997), Lutzenhiser, Harris and Olsen (1997)). But this literature has not been systematically applied to the larger problem of consumption of environmental resources in modern societies. In part, this is due to the prevailing conception among energy analysts that consumption is too diffuse and idiosyncratic to be addressed in planning. On the other hand there is the failure of social scientists and marketers to consider the ways in which consumption involves physical/energetic systems (not just systems of meanings) and their environmental consequences.

Our intention is to use the language of load, base, peak to reconceptualize consumption practices as „load-producing" activities. This enables us to ask new questions about the nature of „necessary" and „exceptional" energy use, the „waste" of energy in social „stand-by" states, and the appropriate „size" and „scale" of ways of life in contemporary societies. These have been addressed in the past as „valuative" questions—questions about right and wrong ways to live (e.g., Illich 1974). The growing attention on the sustainability of modern levels of consumption of energy and other resources places new demands on research and policy. We use the metaphor of social load to illuminate analytic approaches and vocabularies that address these questions of scale and dimensioning. In the following, we offer some examples of social peak load building, „dimensioning" of demand, and the drivers and dynamics of social loads.

For present purposes we are most interested in energy and material load-dimensioning which overtly relates to facilitating social relations—those which are oriented to the „social" aspects of everyday life involving the collective, communal, and interactive business of „doing things together." Here we find the energy supply system notions of „base" and „peak" loads as useful. But as we shall see, the two terms do not describe completely separate spheres of activity, nor are they neatly separable through time, with peak load activities sometimes evolving into base loads. By social base load, we mean those demands for energy produced by ordinary, routine, regular activities (e. g., cooking, cleaning, washing, heating and cooling, commuting). We recognize moreover that these fluctuate during the day and change throughout the year as persons adapt to changing environmental and social conditions. On the other hand, social peak load refers to increases in consumption of space, water, food, lighting, cooling, heating, travel, refrigeration and so on which are due to certain social events and activities.

Before we proceed with examples, we should make the observation that all energy-using technologies are inherently „social," rather than simply being „technical" or „mechanical." The sizes, shapes, features, capacities, horsepower, wattage, screen size, etc. of devices all are determined by social processes—some involving manufacturers in relative isolation, others benefiting from market research/intelligence, and some shaped by traditional cultural expectations shared by consumers and producers in a society (e.g., how large should a canned ham be, where should light switches and fixtures be located, etc.). Physical realities, along with the limits of materials and production processes, are obviously involved here as well, but even these are socially-processed and selec-

tively introduced into technological development. As a result, all energy loads can be seen as social accomplishments, to which designers, engineers, architects and manufacturers all contribute, each with their own socially constructed traditions.

2. Case Studies of Social Load Production

The following cases illustrate social peaks and some of the social and cultural factors responsible for them.

2.1. Norwegian Residential Space Heat and Lighting

Space heat and lighting play a central role in the creation of the Norwegian living room (Wilhite and Ling 1992). Energy consumption for both are high even by Scandinavian standards. These heating and lighting practices are sensitive to social peaking for visitors. When a guest enters on a winter evening, a customary part of the usual greeting routine is to say: „Her er det godt og varmt" (It is nice and warm here). For a guest to give an indication that he or she is not comfortably warm constitutes a social crisis for the host. Thus the host insures against this by turning up the heat. His or her entire heating system must be dimensioned to be able to tackle this social peak.

The size of the social peak for heating is further exaggerated by clothing conventions. The situation in Norway is that while sweaters are an integral part of the Norwegian winter wardrobe, the are curiously inappropriate for dinners and parties in the home. Lightweight clothing is compensated for by turning up the heat.

Lighting is also important in the Norwegian home, but not just any kind of light will do. A particular lighting aesthetic influences dimensioning. Light from ceiling lamps is considered to be too harsh for living areas. Lots of candles, small table lamps and other shaded lamps are strongly preferred. A house not lit n this way is a „sad house," according to respondents in one study (Wilhite and Ling 1992). Lighting preference is not driven by any physical criteria concerning amount of lumens, but rather a cultural criteria that light be created in such a way as to provide coziness and aesthetic correctness. This social load is behind high energy usage for lighting, twice that of Norway's neighbors, Sweden and Denmark (Tyler and Schipper 1990). Adding to this materials, such as lamps, bulbs, cords, tables for the lamps, etc. which support these lighting practices, one can see that this socially-driven load is both energy and materials intensive.

2.2. Home creation in Scandinavia and North America

For many people, especially middle-class homeowners, the act of home creation is never finished. Homes are put through phases of both large and small renovations over the course of a given households occupation - activities defined as «nestbuilding» by Wilk and Wilhite (1983). Nest-building involves the use of materials and energy, but is essentially a social activity, influenced by changing notions of aesthetics, family demands and perceptions of the constituents understood as providing the family with a solid and secure base. All of these activities are not only pursued to satisfy the occupants themselves, but also outwardly directed to friends, family and neighbors. The home is for many a symbol to the outside world of the well being, taste and status of the family within.

Evidence from the U. S. shows that these inward and outward-directed social motives drive a range of new material loads for homes. Examples are larger dwellings with many roofs (to assure „street presence") and large expanses of windows which provide light, views, and allow display of home interiors. The use of automatic systems is increasingly common, with lighting, HVAC, security, irrigation, video, music, and tele-communications included in integrated designs. Special-purpose rooms such as offices and libraries expand social and energy loads, as do increasingly individualized spaces such as personal rooms, baths, and suites. Other examples are specialized cooking and bathing equipment, which attest to the owner's culinary knowledge and sensuality. Very large refrigerators, with chilled water and ice available on the outside of the door. are now the norm in both new and old American houses, and at least two garage spaces are required (with new housing often having three). All of these features represent social loads that follow from planning for peak use of housing, display of social standing, meeting of minimum social expectations, and efforts to craft „individualized" spaces . All of these, of course,

must conform to collective aesthetics in order for the owner's good taste to be recognized.

«Good taste» in consumption most often translates into more, bigger or more complex, though this is not always the case. Green values can lead to conservation and/or simplicity. Interestingly, the conspicuousness of such projects is still important. Studies of middle class, home owning households in Northern California in the early 1980's revealed that visible conservation projects like installation of wall and ceiling insulation (visible at least in the installation phase), energy efficient windows, solar panels, heat pumps and even greenhouses were much more likely to be done than less conspicuous projects like weatherstripping, even though the latter was much more economically rational (Wilk and Wilhite 1985).[2]

2.3. Japanese Air Conditioning

A look at Japanese air conditioning practices illuminates several aspects of social loading. In homes and workplaces, natural cooling is increasingly rare in Japan, especially in urban areas. This is interesting in light of the fact that air conditioning was hardly used at all in Japan 40 years ago. The reasons for this rapid change in cooling practices can be related to changes in building practices - modern buildings and their ventilation systems do not lend themselves to natural cooling. But these changing practices are also tied up with a changing ideas about what it is to be a modern Japanese family. Air conditioning is associated with modernity, to the extent that even families in traditional dwellings, who may be quite satisfied with natural cooling, feel pressured to install air conditioners (Wilhite et al 1996).

Despite the diffusion of air conditioning hardware, there is still a curious resistance to extensive use of air conditioners in the dwellings in which they are installed. One explanation is a still predominant folk theory which says that artificially cooled air is bad for the health. Another is that electricity is expensive. In those homes in which use is increasing, the impetus is coming primarily from the male occupant. Air conditioning is turned on before their arrival from work, where males have spent much of the day in air conditioned work places (only 46% of adult women work outside the home and working women work on average shorter days on average than men). There, social load is affected by clothing norms. A business suit is mandatory in most white collar work places, regardless of season or temperature. This means that thermostats must be lowered. Conditioning to artificially cooled environments may be carried over to the home. The women in our sample did not as a rule use air conditioning while the male is away from home (Wilhite et al 1996).

The social load for air conditioning is tied up with ideas of what it is to be a «modern» family, important elements of which have been imported from Western consumer culture. Clothing customs imported from the West are tied up in this social load as well. Both the symbolic role of air conditioners and business clothing practices are growing in countries in Africa, India and Latin America. This constitutes a potentially extensive, socially-driven expansion to global cooling load (Agbemabiese et al 1996).

2.4. Private Transport

A recent issue of an American automobile magazine began its review of „near-luxury" cars with an imagined conversation between the reviewer and a corporate executive. The subject was the implications of various auto choices (Car and Driver 1997). The prospective car buyer is counseled to drive something „special" as befits his status, but to be careful to locate the choice at the appropriate price level vis a vis his and others' incomes. Since the buyer's wife probably drives a sport-utility vehicle, he should choose a four-door sedan. However, the car cannot be „flashier" than those of his superiors in the corporate hierarchy, nor should it be too „sporty," since it must convey a serious image and be large enough to occasionally transport four persons from „three-martini lunches" to the golf course—in executive style, of course. Having settled on nine vehicles in the class („nine ways to express yourself on the way to the top"), the review goes on to compare their features. Some of these are worth noting. The weight and size of each car, as well as the performance expectations of its middle-aged driver, dictate that it will have at least six cylinders and probably a turbocharger. As a result, fuel economy is quite low—from 0,1 - 0,14 liter/km. All of the cars, however, are equipped with a full range of sensors, controls, and elegant finishes (although not too elegant, since some materials and design features are reserved for „luxury" cars). In addition, the cars are over-sized, «just in case».

A similar story could be told about other sorts of cars—e.g., sports utility vehicles and mini-vans, which are the fastest growing segment of the domestic car market in the U.S. (about 50% of new car sales). Light trucks also represent a growing segment of the market. What once were considered „work" vehicles (jeeps, vans, pickup trucks), have increasingly been seen as „play" vehicles and now are standard „family" vehicles. They have been exempted from U.S. federal fuel efficiency standards because of their original „work" identities, and, of course, they all record fairly low fuel efficiency ratings - often significantly less than 0,12 liter/km. However, they have characteristics attractive to many Americans: they readily convey the owner's ruggedness and ability to easily sur-vive extremes of weather and terrain (including inhospitable urban territories); they may be seen as attesting to the driver's family values and ability to afford a large commodious vehicle; their size is somehow reassuring, in some ways reminiscent of 1950s American „land yachts." While the U. S. is the place where the automobile has likely taken on the most social/symbolic meaning, the social nature of cars is not unique to the U.S. Automobiles everywhere are loaded with symbolism. Far from providing just a means to get from A to B, they provide thrills, assure freedom of mobility, offer quiet spaces, exhibit machismo, and display social status, all of which contribute to social load.

3. From Peak to Base: The Durability of Dimensioning

Determining a base amount of consumption for any given consumption activity is fraught with both analytical and political pitfalls. Even something so basic as refrigeration is problematic. No one really „needs" a refrigerator, but given the packaging and distribution of foods, it is difficult to participate in normal food provisioning and eating without one. So by reasonable consensus, a refrigerator might be considered a basic, utilitarian piece of social hardware. A very small unit (e.g., 1/3 cubic meter) would be sufficient, but these are nearly non-existent in the U.S. and are increasingly rare elsewhere. The answer to why this is so is most probably because persons choose on social grounds to have bigger cold boxes in their homes. Families with two working parents may want to shop only once a week and to store a week's worth of food. They may want refrigerators to hold a number of 1 liter soda bottles so that children and their friends can be readily provisioned. One of the defining elements of being a good parent might include never running out of soda, hence the large storage unit. Special compart-ments might be wanted for special foods. This reflecting, of course, that the more special foods you know about, the more sophisticated you are. Socially, one certainly wants their refrigerator to be of properly sized (i.e., meet-ing the expectations of others) and part of this involves fitting it into the space already provided by the cabinet makers, kitchen designers, contractors, and former owners. And one does need space to hold large amounts of food for special social occasions such as holidays, parties and the like.

The same sort of calculations can be made about the social dimensioning, utilitarian qualities, and peak require-ments of the kitchen stove, dishwasher, television (which is getting very large in the U.S.), computer nook, home office, clothes washer and drier, car, truck, minivan, sports utility vehicle, heating and cooling systems, gourmet kitchen, or the emerging bathing parlor with its multi-headed showers, double sinks, and very large jetted tubs. The selection and maintenance of these and similar material/technical arrangements clearly involve considera-tions of many idealized, but rarely realized, social situations such as entertaining, gastronomic extravaganzas, erotic encounters and the like as well as social relations involving kinship, friendship, respectability, and status. As a result, these social dimensions are embodied in the sizing, shaping and design of these systems. Not only do these factors determine the sizing of systems, but they sometimes wisely provide needed buffering against unex-pected events. In fact, they sometimes may be used in unimagined ways. In some cases, they may actually encourage the creation of the social forms and events they were designed to accommodate, such as parties for the people from the office, visits by relatives, rides for the soccer team, etc.

It is difficult to differentiate a „base" from a „peak" social load. Indeed, the difficulties involved perhaps make this distinction of dubious value. Nevertheless, a helpful insight here follows from the observation that often what is now taken to be conventional and basic social hardware was once regarded as unnecessary, luxurious, or even frivolous. Take the evolution of the house in Japan. Not so long ago, sleeping took place at night in what was „living space" during the day— this was a very efficient arrangement - as it had been in earlier European or American homes. Today, the bedroom has arrived on the scene in Japan and the shared bedroom is on its way to becoming extinct in other industrial societies, too. Its replacement in the most affluent cases is the individual-

ized sleeping and bathing suite. The same sort of thing has happened with automobiles. Several decades ago, the „family car" was the rule. Now we increasingly find a proliferation of individual cars and individual travel patterns. So what is socially „basic" and a social „base load" is constantly in the process of renegotiation and change—most often in the direction of increasing consumption of energy and other resources. The spare room becomes the guest suite, the minivan (acquired to accommodate hoped-for guests) becomes the minimum expected ride.

Social peaks, and the planning for and building of them into the social hardware of industrial societies are important to take into account for at least three reasons. Initially, they result in rarely used capacities through overdimensioning. As such, they are constant energy drains through maintenance of unused capacity in „stand-by" modes. Secondly, when put to use, large reserve capacities can contribute to growing system peaks particularly when utilized in concert at certain times of the day, week, or year. And finally, they lay the groundwork for an expanding base load at the levels of the household, the energy system, and the society.

4. The Determinants of Social Loads

We see from the above discussion that social loading in industrial societies can be quite similar in some instances such as using refrigerators, cars, stoves, and bedrooms, but also be surprisingly different in other ways (e.g., Norwegian lighting, American refrigerators, Japanese air conditioning). Is it then possible to make some general observations that might hold true across cultures? While we do not attempt to present a definitive model here, we do wish to point out four clearly relevant and interrelated social dynamics. These are: status and display, sociality and conventionality, security and convenience, and the embeddedness of consumption patterns.

4.1. Status and Display

„Status marking"—the process of using goods and other objects for purposes of status display—is a persistent practice across cultures (Douglas and Isherwood 1979). One's standing in the community is displayed through culturally-appropriate arrangements of items that allow the person (or family units) to be differentiated from persons of „other sorts." This process of „distinction" often involves matters of taste and style and is largely rooted in wealth-based social hierarchies (Bourdieu 1984). The economist Veblen (1899) first noted the importance of „conspicuous" even wasteful consumption in marking members of the upper middle classes as distinct from persons of lower social standing—a process that continues within and across cultures. The use of signs to locate oneself in the social landscape is a process of deploying material objects, many large in size - even monumental in scale, as in the case of opulent housing requiring significant energy investments and ongoing energy expenditures. It is possible to pursue less material and energy-intensive lifestyles—and even to excuse oneself to some degree from the status system—but maintaining «good» social standing tends to be quite important for persons in all industrial societies. Status indicators vary both across and within each society, however, and the nature of those indicators influence social load. A common thread across industrial societies is that the consumption of things confers status—thus increasing load, but this is done in different ways in different countries.

Because status construction encourages emulation, and the globally competitive industrial-commercial system encourages and enables rapid emulation, efforts to maintain distinctive status-based consumption patterns and cultural meanings require constant innovation (Lutzenhiser 1997). Much of the transmission of style from the industrial to the developing world involves the creation of new loads there—along with employment in the production of stylish items for consumption in the Northern societies. If trends were to move towards „green" items with less energy embodied in them and entailed in their use, the dynamic of distinction/emulation might have the opposite effect.

In the U.S., the engines of change turn faster, in part because pursuit of change is a defining element of culture, and in part because the locomotives of markets and capitalism have freer range there. Green trends have been hindered by those same forces. In some parts of the world, traditional culture exerts greater influence on consumption patterns. But, on the whole, the values and practices of modern consumerism, with their roots in post-World War II North America and Europe, are rapidly spreading.

4.2. Sociality and Conventionality

From the point of view of the individual or household, linkages between consumption and the good life not only affect self-gratification, but also the social construction of success in life. In even the most traditional societies, the ways people dress, eat, transport themselves and create their homes are all a part of a joint construction. Women, men and children live together, generally enjoy each other's company, and expect their social interactions to take place in certain ways and in certain sorts of places. Members of all societies learn to understand what social conventions are and how they are expected to behave. So within status ranking systems where persons are concerned with marking their differences from others, levels of consumption and objects of consumption become material extensions of social identity. Within communities and groups defined by their collective interaction, social loadings are constructed in normative ways. This is not to say, however, that most persons slavishly adhere to convention or that these systems never change. The process is a complex one.

For many of us all of the time, and for most of us some of the time, there are differences between our private and public demeanor. The way we look, talk, eat, and entertain ourselves is situational. The constellations of things and behaviors we choose vary according to activity, but also according to who is present. The home is a special place in this regard for the reasons discussed earlier. Its outward appearance is a constant beacon carrying elements of identity. The inside is a refuge, and therefore a place to relax and escape social demands—but also a place where visitors are entertained and where social identity is constructed, maintained and repaired. In many parts of Europe and North America, a practice of the early part of this century which is still found in many homes, is a special room for visitors only. In Scandinavian languages, this room is called the „finstua" (nice or classy living room) and is usually off limits to children. The best furniture is placed there, and it is kept clean and tidy at all times in anticipation of guests. This tradition is waning, but is indicative of the weight we put on creating a correct impression for guests, or at least in insuring against making a wrong impression. A new special place in North American homes is the „great room"—a large, tall, spacious room for entertaining as well as family activities.

Creating the home is thus a process of convention-governed social dimensioning and load-building. The „finstua" and „great room" are fine examples, as are the equipping of houses with new appliances, large fireplaces, Jacuzzi baths, huge refrigerators, and, as we have shown in the case of Japan, air conditioners. Conventionality (concern for propriety and conventional esthetics) often exerts a conservative influence on behavior and material arrangements—upholding older standards, discouraging the new, and slowing change in the system. But when the status indicators change, obtaining and displaying the right things can serve as an impetus for change—as in the case, for example, of home improvement efforts bringing both positive and negative energy demands and environmental impacts.

Of course the ways homes are created differs according to age groups and social class. The nestbuilding of Europe and North America is largely an activity by families with mid to high income. Tastes in cars and the ways cars are used varies according to age. Separate dynamics are not uncommon in the same household, where consumption decisions and practices are sometimes caught up in a larger disputes or negotiations, both among adults and between adults and teens (Park 1985).

4.3. Security and Convenience

Beyond social standing, there are some quite practical reasons for over-dimensioning systems. In lives which are for many becoming increasingly hectic, convenience is sometimes the most important determinant in a purchase or use pattern. This is especially true for transport, where choices to use alternative transport are difficult and sometimes next to impossible. A family with young children and both parents in full jobs could hardly cope without a car almost anywhere in Europe or North America. Even in compact Oslo, a city of 450,000, schools and workplaces are located such that commuting, delivery and pick up of children alone are enough to make an automobile necessary. There are good reasons for oversizing, too. Very large refrigerator can hold a lot of food, accommodate visitors, eliminate trips to the store, preserve food produced and processed within the household, even guard against shortages. Food shortages have become more frequent as storms disrupt travel, transport systems, and even urban power grids. There is a margin of safety involved with larger-than-necessary cars, heat-

ing/cooling systems, and even living space. What happens if unexpected guests arrive to stay for the holidays?

However, a persistent concern for security and oversizing can reach serious, perhaps even pathological, proportions. In the United States, this can be seen in terms of the pursuit of „bigger is better," „all you can eat," and keep cool in the summer, etc. (Prins 1992). The result of these concerns may be an over-dimensioned, by European and Asian standards, society difficult to „down-size." This takes places because oversizing operates as a form of risk management—a hedge against an uncertain future.

In any design problem , whether it involves military equipment, factory operations, and highway bridge design, there are tradeoffs between over-dimensioning, cost, backup systems, contingency plans, etc. Ordinary people, too, have to weigh similar considerations. The issue remains, however, just how much over-dimensioning is reasonable and prudent, how much is a bit too much, and how much might be considered wasteful? An interesting case is the nearly 50% of new vehicle sales in the U.S. that is made up of mini-vans and sports utility vehicles. There are practical reasons to want a four-wheel drive, anti-lock brake, air bag-equipped, crash-protected, fast getaway, high-above-the-action vehicle as insurance against uncertainty—although the likelihood of having to go on safari while driving home from work is near zero for nearly all owners. But American roads are not safe places. More than 40,000 persons are killed every year on U.S. highways, and even though freeway sniping, riots, and car-jackings are uncommon, they are highly publicized. One consequence of this is that it makes a certain amount of sense to want to protect oneself against even unlikely eventualities if one can afford to do it. The vehicle may not offer all that much real protection, but in an individualistic and risky society, it may allow one to feel protected.

Although the idea of having a vehicle for protection against a wild world has not spread to European countries, ownership of sports utility vehicles for stylistic reasons is increasingly common in Japan. And, one of the safest—and heaviest—cars in the world is the Swedish Volvo station wagon—a family car long in favor with environmentalists in the U.S. and elsewhere. „Protecting the family" is a very important value in Scandinavian culture, and in this case a kind of overdimensioning has lead to production of a very safe car.   Its components are durable, and this durability also translates into extra weight and higher levels of embodied energy. On the other hand, greater durability may at least partially offset the energy costs of heavier weight, so that lifecycle efficiencies may be higher [3]

4.4. Embeddedness in Systems and Structures

Having things, interacting with things, and shopping for things are all aspects of consumption that are important to many people in modern, industrial societies. Consumption contributes to self-satisfaction and serves as an indicator of a good, successful life. Not coincidentally, the
logic of economic systems requires an expansion of consumption. So the entire social fabric is constructed in such a way as to encourage the association of consumption with the good life. In fact, what advertising mainly does is to work on this association (as opposed to emphasizing a product's characteristics or qualities), precisely because it is more likely to stimulate the volume and pace of consumption.

Advertising and media representations are intended to play on fantasies and stimulate certain kinds of choices. But advertising is only one element of a complex system of production and distribution of goods and services including webs of firms, institutionalized professions, agencies of governance and regulation, community structures, and cultural systems of meanings, habits and practices. These vary, to some degree, between societies—although all societies are involved to varying degrees in a single, increasingly integrated, global system of consumption. The precise nature of that system remains to be negotiated. But attempts to change consumption patterns face impediments, some of them daunting. At the micro level, social loads are taken-for-granted and embedded in habits, and are therefore hard to recognize and harder still to imagine changing. Present arrangements are most often seen to be up-to-date and welcome improvements over past conditions. Social hardware is also systematically caught up in other systems of meaning, in which personal reputations, status, stature, and identities are all at stake. Change is risky in these systems. Items of social hardware (and its dimensions, patterns of use, and energy requirements) are also built into the material context (e.g., a large cavity in the kitchen wall anticipates a refrigerator to fill it), and into regulatory environments. The latter may require such things as plen-

ty of electrical outlets, a large electrical service panel, lots of lighting, large HVAC capacity (assumed in building codes). We may find, as well, that larger cars have lower insurance premiums, etc. Finally, existing hardware and use configurations are supported by institutional barriers in work hours and schedules, dispersed location of work from home, and higher profits in selling large-sized things, such as houses, appliances, and automobiles. Webs of social relations buoy up the consumption system as presently constituted and serve as barriers to its transformation.

5. Research and Policy Agendas

If our expansive view of „social loading" is workable, it reveals to energy analysts a world that isn't merely idiosyncratic and governed by individual preference, but one in which individual actors make choices, use things and trigger energy flows as part of their ongoing work of creating and sustaining social relations. Some of these patterns we would probably all agree are good. People should have a place to sleep at night, a bit of privacy, and a way to warm their soup. But some are, from a sustainability point of view, fairly silly and useless (e.g., automobiles that can travel 250 km/hr but are limited by law to 120 km/hr or less. But all of these patterns—these „social" loads—do important social work, and the nature of that work must be understood before one can attempt to change these patterns — whether by regulation, tinkering with technologies, through incentives, information, etc. We do know that social loading patterns vary a good deal across cultures and that they are often rooted in deeply-held, not always conscious, beliefs reinforced by social dynamics. We also know that these patterns can and do change, and that societies exchange and adapt ideas from one another as well as ways of relating to persons, hardware, and so on. So opportunities exist for change. Some are in the direction of greater efficiency, others are not.

5.1. Research

A social-based research agenda directed at sustainability would first draw attention to the social life of things and the social nature of consumption. One of the reasons that a social orientation is so important is precisely because it has been largely ignored in the past. Research guided by economic and engineering perspectives have dominated the field and, by focusing nearly exclusively on machines, problems of pricing, and assumed „rational" action, the bulk of this work has failed to grasp the nature of the phenomena of interest. A more fully social appreciation of consumption and load-building implies an agenda that goes far beyond traditional techno-economic modeling.

Such an agenda would ask penetrating questions about meanings and practices at the locus of consumption itself. It would also work to map the webs of organizational and regulatory action, advertising and distribution, through which social hardware must flow. And it would ask broad, macrosocial and philosophical questions such as whether „conspicuous consumption" is necessary for the maintenance of modern societies, and whether there is an inherently egalitarian value position underlying the quest for „sustainability." Can the creation and maintenance of systems of deference, authority and privilege characterizing all human societies to date ever take place without the bulky display? Or do humans require monumental scale in order to sustain awe? Is the choice to refuse palatial architecture really one about the kinds of societies we wish to encourage and inhabit?

5.2. Policy

These are questions for citizens and policy makers as well as scientists, of course. Informed policy making about consumption on a global scale requires learning from observations of the dynamics behind the formation of social loads and using insights gained from this to develop new models of social organization. This would entail sustaining a policy dialogue about global environmental change, consumption, lifestyles, values, community development, human rights, and the future—a dialogue that is much more advanced in Europe and Japan than in the U.S. at this juncture. The «counter culture» reactions to ostentatious materialism of the late 1960s and early 1970s in the U. S. (Mailer 1968) were short-lived and bounded, as the pursuit of „appropriate technologies" (Schumacher 1973), „soft energy paths" (Lovins 1977), and the livable communities of the „new urbanism" (Katz 1994). Some of these efforts to „down-size" or „right-size" social loads have been radical, but many have been

incremental, community-based, and in most regards quite mainstream. Here, one could point to such examples as Davis, California's massive adoption of solar energy and the bicycle, the advent of car-sharing cooperatives in Germany and Scandinavia, and urban planning in the Netherlands where efforts are made to locate new office buildings near train stations and thus encourage train commuting and discourage driving.

Policy with the goal of encouraging sustainable consumption should be interested in seeking out these examples and asking why these efforts take root, why some are successful and why others fail. It should also attempt to identify trends that may encourage changes in consumption in more sustainable directions, such as the aging of the post World War II „baby boom," and its transition from family homes and cars into more modest housing (and perhaps more sustainable transportation patterns). We should also revisit the experience of the 1970s oil shocks, after which social definitions of „small" cars shifted from „inferior" to „sporty," „practical," „zesty," „-perky," and „quick," with an eye toward asking how policy might stress the linkages between scale and environmental impact (where these linkages can be documented).

At bottom, policy efforts to encourage sustainability must do something that has been taboo in many industrial societies—make some effort to address wasteful or overdimensioned consumption. Just what constitutes a „base" or „basic" amount of consumption, what is a reasonable peak, when is a sociotechnical system „overdimensioned," are matters for collective deliberation and individual choice. Questions about how many children should share a room, whether a family (or an individual) really „needs" a car, or why an office can't be located in a bedroom are questions that bear on identities, values and perceptions of quality of life. In the post Cold War world they cannot be addressed by authoritarian states, nor should they be. But they need to be raised, discussed, and collectively addressed—since the systems that sustain present high levels of consumption and environmental degradation are collective enterprises. Consumption «is» social and its analysis and alteration, therefore, require social sensitivity and self-consciously social process.

6. Endnotes

[1] The pursuit of better load factors governed the growth of many electric utilities early in the century (Hughes 1983) and provided a rationale for „load building" activities after World War II. In recent years, airline companies have become quite adept at improving their load factors through the strategic use of discount pricing.

[2] This was brought home by the fact that in homes where people had spent huge sums of money on insulation and other projects, gaps around doors and windows were often ignored. The economically rational decision would have been to invest a few dollars and an hour or two of work setting up weatherstripping. Why didn't people do it? Because the work involved is considered to be neither fun, glamorous or worthy of showing off to visitors not likely to express much if any admiration for a weatherstripped door or window.

[3] While aiming for recycling, reuse, and replacement with greener and more durable products are important goals, these activities will not be enough to offset the environmental consequences of present levels of consumption in high consuming societies (e.g. North America, Europe and Japan) and rapidly increasing consumption in other parts of the world (Wilhite 1994). This fact directs attention to the consumption patterns themselves (driving, cooking, heating space, etc.), and makes understanding the social processes underlying them crucial.

7. References

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