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Supersizing the American Dream in an Era of Climate Change

by Jack N. Barkenbus

Thoughtful Americans recognize that the United States is a prodigious consumer of energy and natural resources, and as such, a large-scale emitter of carbon dioxide (CO_2), the primary greenhouse gas (GHG) forcing climate change. Few, however, recognize the truly, singular nature of the U.S. contribution to climate change. The U.S. share of CO_2 emissions from energy generation is approximately 20% of the global total, which when allocated across the entire population, comes to a little over 20 tons per person per year. Some countries, such as Australia and Canada, have comparable per capita emissions, but without a large population base, their total emissions pale in comparison to the United States. China's total emissions rival those of the United States, but China's per capita emissions are exceedingly small (3.9 tons per person). Moreover, if we compare the United States to its economic counterpart, the European Union, we find European per capita emissions to be roughly one-half those of the United States.[1]

Various explanations exist for why the U.S. emissions profile is *sui generis*. Some examples might be the country's large coal-based electricity generation and its extensive geographical scope (making the transportation sector a large-scale emitter). An equally compelling explanation highlighted in this Article is that American individuals and households, through their pursuit of the American Dream, have created a lifestyle inimical to combating climate change. Statistical evidence will be marshaled demonstrating that the "supersizing" of the American Dream—that is, the building of larger dwellings accompanied by the accumulation of more and larger household possessions—has taken place relatively recently and seriously diminishes our ability to reduce our collective carbon footprint.

America's supersizing has taken place oblivious to climate change, being the result rather of a confluence of inexpensive energy and the promotion of a dedicated consumer mindset. With U.S. policymakers poised to place a price on carbon for the first time, either through taxes or a cap-and-trade system, it is reasonable to ask whether supersizing will come to an end. How an American public that has thus far associated supersizing with a superior lifestyle responds to countervailing pressures and incentives remains to be seen.

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1. Comparisons can be made using the database compiled by the Carbon Dioxide Information Analysis Center at http://cdiac.ornl.gov.

I. Supersizing Trends

Prior to documenting important trends, it is necessary to acknowledge that the American emissions profile could have been a great deal worse than it is today. Marilyn Brown and colleagues claim that our increasing energy productivity over the past 30 years (1973-2004) represents "one of the great economic success stories of this century."[2] They cite a significant drop in the economy's energy intensity and claim that had it continued at 1970s levels, we would be consuming twice as much energy today. Technological improvements in the home, at work, and in industry, along with export of our most energy-intensive industries, have contributed to this reduction in energy intensity. However, America is still a singular contributor to climate change, meaning our great success of the past 30 years has been insufficient. And the evidence is quite clear that increasing energy efficiency can sometimes work at cross-purposes to our goal of reducing carbon emissions.[3]

The admittedly simple answer to why we have supersized is simply because we could. That is, we can more easily afford to purchase more and larger items than we have in the past. It is the same phenomenon that so often determines a person's food intake: we eat more because we can afford to do so. A decade ago, a consumer would have paid $6,000 for a large, flat-panel television. Today, the average price is $1,800 and falling.[4] It used to take an average wage earner over 400 hours of work to afford a personal computer, and now it only takes approximately 25 hours.[5] Rising affluence combined with technical advances make a powerful recipe for supersizing.

These trends are taking place as the U.S. population and number of households increase. The U.S. Census Bureau projects that the U.S. population will swell to 420 million by 2050, roughly a 37% increase over current levels. Households are expected to increase even faster, with a 55% in-

2. Marilyn A. Brown et al., *Assessing U.S. Energy Policy*, 135 Daedalus 9 (2006).

3. This is due to the so-called rebound effect. *See* Sussex Energy Group, The Rebound Effect: An Assessment of the Evidence for Economy-Wide Energy Savings From Improved Energy Efficiency (2007).

4. Annie Groer, *Flat-Panel TV Prompts New Focus in Home Décor*, Tennessean, Mar. 9, 2008.

5. Michael W. Cox & Richard Alm, *You Are What You Spend*, N.Y. Times, Feb. 10, 2008.

crease by 2050 over today's 113 million.[6] Roughly two million new homes are being built each year.[7] Even by stabilizing or marginally reversing the trends outlined in this Article, therefore, we may see little impact on the aggregate total of our carbon emissions.

A. Housing

We begin with houses, as their supersizing is fundamental to understanding the entire supersizing process. Larger homes enable the purchase of more and larger appliances, allow for more extensive garage space that will serve as a home for multiple and large personal vehicles, and require more heating and cooling to ensure comfortable indoor temperatures. The construction of larger homes is well documented and goes back beyond 30 years. In 1949, the average single-family house consisted of 1,100 square feet (sq. ft.).[8] By the 1970s, average house size had moved up incrementally to 1,385 sq. ft.,[9] but growth picked up considerably thereafter. The average house being built today is nearly 2,500 sq. ft.[10]

Curiously, this trend is taking place concurrent with a consistent decline in average household members (from 3.6 household members in 1947 to 2.7 members today).[11] Putting housing size and housing members together, we can see that homes provided 312 sq. ft. per person in 1949, and by 2005 that number had nearly tripled (926 sq. ft. per person). Figure 1 illustrates the contrasting trends in housing size and housing members.[12]

Figure 1: Housing Size and Members (1940-2000)

Figure 1 The floor area of new homes is going up although family size is going down. Data from the U.S. Bureau of the Census and the National Association of Home Builders.

To emphasize the singularity of America once again, note that the square footage of houses in America is nearly twice as large as those in Britain, France, and Germany.[13]

Space conditioning—air conditioning and heating—constitutes a significant fraction of household energy use, roughly 40% of total energy consumption. All things being equal, the space conditioning requirements of a larger house will be greater than those of a smaller house. Owners of larger houses can reduce space conditioning needs considerably by building "tighter" houses, placing high levels of insulation throughout, and using windows strategically.[14] Even so, research by Alex Wilson and Jessica Boehland has demonstrated that a small house built only to moderate energy performance standards still uses substantially less energy to heat and cool than a large house built to very high energy performance standards.[15] From a life-cycle perspective, a larger house necessitates the placement of more materials, e.g., lumber, all of which come with their own associated carbon emissions.

Perhaps the ultimate in supersizing is the increasing prevalence of second-home buying. The National Association of Realtors reported that in 2005, there were sales of 3.34 million homes acquired by those already possessing a dwelling.[16] These houses, purchased as vacation homes, retirement homes, or investments, may have no occupants for most of the calendar year.

Few policy proposals have been designed to get Americans to value smaller homes. One was the proposal by Rep. John D. Dingell (D-Mich.), in association with broader climate change legislation, to phase out the mortgage interest tax write-off on larger homes. Representative Dingell's plan suggested a graduated reduction starting at 3,000 sq. ft. and a total elimination after 4,200 sq. ft.[17] The proposal immediately garnered predictable and fervent opposition from the building industry, and has since been taken off the policy agenda.[18]

B. Inside the Home

Inside modern homes, we find some similar items to those found 30 years ago, and some items that are completely novel. Even those familiar items have often undergone supersizing such that they scarcely resemble those of a previous generation.

In terms of novel items, we now see a plethora of what are termed consumer electronics. Aside from televisions, these items did not exist 30 years ago, but have now become standard household items. A 2007 study for the Consumer Electronics Association identified 16 consumer electronics and devices that collectively consumed about 147 terawatt hours (TWh) of electricity in U.S. homes in 2006 (the most

6. U.S. Census Bureau, U.S. Interim Projections by Age, Sex, Race, and Hispanic Origin: 2000-2050 (2004), *available at* http://www.census.gov/ipc/www/usinterimproj/.
7. Barbara Fahrar & Timothy Coburn, *A New Market Paradigm for Zero-Energy Houses: A Comparative Case Study*, 50 Environment 20 (2008).
8. Hal Kane, Triumph of the Mundane: The Unseen Trends That Shape Our Lives and Environment 112 (2001).
9. *Id.*
10. National Ass'n of Home Builders, Housing Facts, Figures, and Trends 13 (2007).
11. U.S. Census Bureau, Demographic Trends in the 20th Century (2002).
12. Alex Wilson & Jessica Boehland, *Small Is Beautiful: U.S. House Size, Resource Use, and the Environment*, 9 J. Indus. Ecology 277 (2005).
13. McKinsey & Company, Curbing Global Energy Demand Growth: The Energy Productivity Opportunities 65 (2007).
14. Dina ElBoghdady, *Can Big Be Green?* Wash. Post, Jan. 25, 2008.
15. Wilson & Boehland, *supra* note 12.
16. National Ass'n of Realtors, Second Home Sales Hit Another Record in 2005 (2006).
17. John D. Dingell, *Summary of Draft Carbon Tax Legislation*, http://www.house.gov/dingell/carbonTaxSummary.shtml (last visited Oct. 13, 2008).
18. National Ass'n of Home Builders, *Mortgage Interest Tax Deduction on "Big" Homes Opposed*, http://www.nahb.org/news_details.aspx?newsID=5450 (last visited Nov. 3, 2008).

familiar of these items being such things as DVD/VCR players, personal computers and peripherals, and video games).[19] The study claims that these items now draw 11% of U.S. residential electricity consumption and that their growth phase is not nearly complete. The Electronic Industries Alliance (EIA) predicts that the household energy consumption share of consumer electronics will rise to 18% by 2015.[20] And, in response to consumer desire for amenities in homes, house builders are increasingly wiring new homes to accommodate the influx of these devices.[21] Table 1 lists the kinds of household items we have in our homes today in comparison with those that were present 30 years ago. Traditionally, major energy household consumption has been associated with space and water heating, as well as air conditioning. Their predominance, however, is likely to be challenged in the future by both older and newer electricity-drawing devices.

Table 1: Familiar Energy-Using Products in the Home

1978	Today
Television	Televisions
Vacuum Cleaner	Vacuum Cleaner
Hi-Fi Music System	Mini Hi-Fi Systems
Hairdryer	Hairdryers
Washing Machine	Washing Machine
Iron	Iron
Electric Blanket	Electric Blanket
Radio	Radios
Sewing Machine	Sewing Machine
Cassette Player	DVD/VCR Player/Recorder
Refrigerator	Refrigerator/Freezer
Toaster	Toaster
Lamps	Lamps
Clothes Dryer	Clothes Dryer
Oven	Oven
	Computer/Monitor/ Printer/Scanner
	Set-Top Box
	Mobile Phones
	Hair Irons
	Electric Toothbrushes
	Wireless Telephone/ Answering Machine
	Slave Portable Phone Handsets
	Ice-Cream/Bread/Smoothie/ Makers
	Dishwasher
	PlayStation/Games Console
	Power Tools
	Digital Clock/Radios
	Microwave

Adapted From: Energy Saving Trust, *The Rise of Machines: A Review of Energy Using Products in the Home From the 1970s to Today*, June 2006.

Many personal electronic devices will have a short shelf life in our homes due to planned obsolescence, technological innovations, or fast-changing consumer trends. The energy and GHG emissions associated with the safe and responsible recycling and disposal of these huge volumes of discarded materials can be substantial.

C. Televisions

Televisions are the largest energy-consuming device in the consumer electronics family. We certainly had televisions in our homes 30 years ago, but we have more now than ever before. In 1978, households had an average of 1.6 televisions, whereas today the number has risen to 2.8 per household.[22] Rather than dispose of old sets when a new television is acquired, Americans tend to simply move the older set to another room. There is a rush to buy even more televisions concurrent with the changeover to high-definition digital television. Americans are expected to buy 32 million new sets in the run-up to the transition taking place in 2009.[23]

Moreover, the televisions we are rushing out to buy today look considerably different than the televisions of 30 years ago—the most obvious difference being size. Thirty years ago, a "large-screen" television had a diagonal measurement of 19 inches (12- to 13-inch screens were considered small and 15- to 17-inch screens, medium).[24] Today's televisions usually begin at 32 inches and move up to 60 inches.[25] Matsushita Electric Industrial Company, maker of Panasonic televisions, has even produced a 150-inch television.[26]

Larger televisions will generally require more electricity than smaller televisions. The concurrent move to high-definition picture also requires more power consumption. There are significant energy requirement differences based on particular television technologies as well. Until recently, our televisions have been based on cathode ray tube (CRT) technologies. These televisions generally had power consumption or wattage (W) ranges of 115-150W. Sales of CRTs, however, were surpassed by liquid crystal display (LCD) sets in 2007 and the gap is still growing. Moreover, sales of CRTs in 2009 are expected to be matched by sales of two other technologies: rear projection screens and plasma televisions. Average power consumption rates for all of the new technologies exceed those of a standard CRT when normalized using a common set size.

Plasma television sets generally require the most power consumption, rating an average of 328W. It is frequently asserted, for example, that a plasma television will require as much electricity to operate as an average-size refrigerator. LCD and rear projection televisions consume less (generally around 200W), but still more than the average CRT.[27] These averages, however, mask a large variability in sets, such that some LCDs can have power requirements larger

19. TIAX, Energy Consumption by Consumer Electronics in U.S. Residences (2007).

20. Rebecca Smith, *That Giant Sucking Sound May Be Your New TV*, Wall St. J., Dec. 13, 2007.

21. Richard Brown et al., Appliances, Lighting, Electronics, and Miscellaneous Equipment Electricity Use in New Homes 9-37 (2006).

22. *Preliminary Television Market and Industry Research* (Jan. 6, 2006) (Prepared for U.S. Environmental Protection Agency (EPA) in support of the Energy Star® TV Specification Revision). Western European numbers are approximately 1.3 televisions per household, McKinsey & Company, *supra* note 13, at 67.

23. *Green Up to a Point*, Bus. Wk., Mar. 3, 2008, at 19.

24. *19-Inch Color TVs*, Consumer Reps., Jan. 1978, at 13-16.

25. *LCD and Plasma TVs*, Consumer Reps., Nov. 2007, at 27-33 (quoting a dealer who says that "60-inch screens have become the star attractions in my electronics store").

26. *An Even Bigger TV, But Who Is Buying?*, Wall St. J., Jan. 7, 2008.

27. Yahoo! Tech, *Big TV = Big Electric Bill*, Nov. 29, 2007, *available at* http://tech.yahoo.com/blog/raskin/16242.

than plasma sets. One study has shown that there can be a factor of 2-3 difference in energy consumption of LCD sets, and as much as a factor of four for plasma sets.[28] Consumers appear to have little understanding of these differing power requirements, and it is uncertain that their purchasing choices would be any different even if they did understand. Americans clearly discern a real difference in entertainment value from these new technologies and may, therefore, discount the importance of operating energy costs (particularly when those costs are not singled out in an electricity bill).

Actual energy consumption depends, of course, on the extent of usage (though some televisions have substantial electricity requirements even when in "stand-by" operating mode). Surveys have shown that Americans watch television far more than others, with a television in operation over eight hours per day.[29] This is in contrast to viewership in the 1970s when televisions were operating six hours per day.[30]

Another characteristic of the newer televisions that stimulates consumer response is their sleek, flat-panel architecture. This feature is not only an aesthetic improvement over bulky CRT sets, but also allows for relatively easy placement in rooms that were less accommodating to previous CRT sets. Hence, we should anticipate the number of household televisions to continue its upward ascent.

Perhaps one of the biggest changes over the past three decades is how we perceive televisions functioning in the household. Thirty years ago, the television was a standalone unit from which household members could obtain educational and entertainment value. Some of the televisions found in households today still function in this manner. But increasingly at least one television in the household finds itself at the centerpiece of an elaborate technological network designed to duplicate the movie theater experience. We have even changed our nomenclature to reflect this development, increasingly referring to television as the hub in our "home entertainment system." Set-top boxes that can bring programs into the household without the DVD/VCR connection are also becoming popular. Other televisions in the household may be functioning in conjunction with computers and their peripherals, as the interconnection between the computer and television develops further.

D. Refrigerators

The good news in terms of refrigerators is that unlike televisions, newer models are increasingly energy efficient, and there is no opportunity for greater usage since it is, and always has been, a 24/7 appliance. In fact, refrigerators are frequently touted as the quintessential success story for energy efficiency. A modern, basic, refrigerator sized to standards of the 1970s requires only 25-30% of the energy that a refrigerator needed 30 years ago. Since refrigerators are the largest energy-consuming appliance in the household (constituting an average of 15% of all electricity requirements in the household), this is certainly good news. While refrigerators are a clear efficiency success, their impact in the context of sustainability and climate change mitigation is decidedly less dramatic,[31] and again, is a function of supersizing.

There are many more refrigerators in operation today because we have far more households in America—roughly 113 million households today versus a little over 70 million in the late 1970s. Moreover, multiple-unit ownership has become increasingly popular and roughly one household in five now possesses more than one refrigerator.[32] The proclivity of Americans to simply move old refrigerators to their garages rather than dispose of them means that getting Americans to purchase new, more efficient, models will not necessarily result in energy savings. Consumers can now even purchase refrigeration modules designed to fit easily within a kitchen cabinet space. The tendency toward multi-unit ownership has not only been noted in America, but in Canada as well.[33]

The refrigerators on the market today are quite different from those sold 30 years ago, both in size and features. The typical size refrigerator in the 1970s was 17-18 cubic feet of capacity. Today the norm is anywhere from 21 to 26 cubic feet of capacity.[34] This is, of course, made possible by our larger homes generally being built with spacious kitchens. In Europe, where homes are much more compact, refrigerator sizes are accordingly considerably smaller.[35]

Refrigerators are not only larger than before, but now come with many features (such as automatic defrost, side-by-side panels, autosweat heaters, and ice-makers/water dispensers) designed to enhance their attractiveness to consumers—all of which reduce the energy efficiency of the unit.[36] Energy conscious consumers can seek out Energy Star® ratings to find the most energy-efficient units, but most consumers are unaware of the costs to operate their refrigerators and hence purchase on the basis of other criteria.

E. Automobiles

The most obvious example of America's penchant for supersizing is in the vehicles Americans drive every day. Transportation constitutes about one-third of our current CO_2 emissions, and what we drive and how far we drive is responsible for a good deal of this.

In 1975, automobiles constituted 80% of the personal vehicles owned by Americans and light-duty trucks (a category that includes pickups, vans, and sport utility vehicles (SUVs)) constituted 20%. Thirty years later, automobiles made up only 57% of the personal vehicle population, and more recently, sales of automobiles to light-duty trucks have

28. Lloyd Harrington et al., *Trends in Television Energy Usage: Where It Is and Where It Is Going*, http://www.energyrating.gov.au/library/pubs/2006-aceee-paper-harrington.pdf (last visited Nov. 4, 2008).

29. *Couch Potatoes*, Economist, July 19, 2007.

30. Jonathan Gutman, *Self-Concepts and Television Among Women*, 37 Pub. Opinion Q. 388 (1973).

31. Jack Barkenbus, *Putting Energy Efficiency in a Sustainability Context: The Cold Facts About Refrigerators*, Environment, Oct. 2006, at 8; Reuben Deumling, *Thinking Outside the Refrigerator: Shutting Down Power Plants With NAECA* (2004) (paper presented at the ACEEE Summer Study).

32. U.S. Energy Information Administration, 2001 Residential Energy Consumption Survey (2001).

33. Denise Young, *Who Pays for the"Beer Fridge": Evidence From Canada*, 36 Energy Pol'y 553-60 (2008).

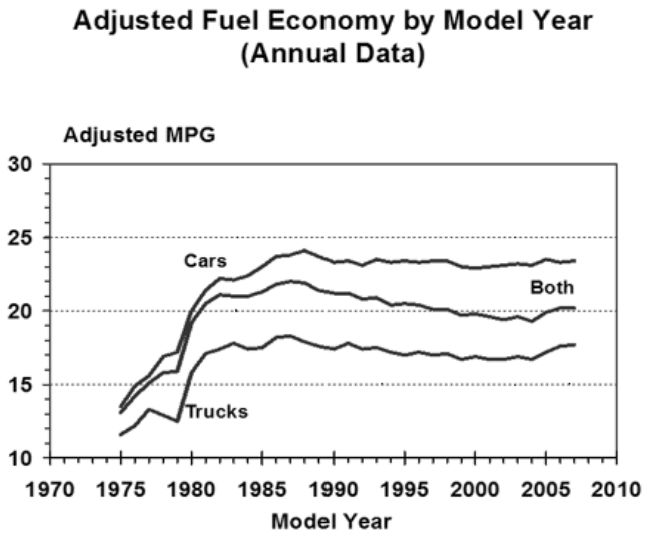
34. *Compare Top-Freezer Refrigerators*, Consumer Reps., Jan. 1978, *with Refrigerators: Cool Choices That Work*, Consumer Reps., Aug. 2007.

35. Umbra Fisk, *Frigi-Dare: On Refrigerator Downsizing*, www.grist.org/advice/ask/2007/07/23/shortfridges/index.html (last visited Nov. 4, 2008).

36. California Energy Commission, *Refrigerators and Freezers*, http://www.consumerenergycenter.org/home/appliances/refrigerators.html (last visited Oct. 13, 2008).

run about 50:50.[37] Unlike the refrigerator example, this remarkable shift in purchasing behavior has not been accompanied by large gains in energy efficiency, as manifest in fuel economy. As shown in Figure 2 below, after a spurt in fuel economy from the late 1970s to the mid-1980s, fuel mileage per gallon has stagnated. The average fuel economy for all model year 2006 vehicles was 24.6 miles per gallon (MPG) for automobiles and 18.4 mpg for light-duty trucks.[38] This is, as usual, in contrast to European standards. It is estimated that driving one mile in the United States requires 37% more fuel than it does, on average, in Europe.[39]

Figure 2[40]



Light-duty vehicle energy efficiency has actually increased steadily over the past three decades. It just hasn't been converted into fuel economy. Table 2 illustrates that this improving efficiency has been used to increase the size/weight of vehicles, their acceleration, and their power. Even the tires on vehicles have grown significantly, as popular wheel diameters have grown from 15 inches to 17 or 19 inches[41]; resulting in a negative impact on fuel economy.

Table 2: Changing Characteristics of Automobiles and Light-Duty Trucks

	1978	2006
Automobiles		
Weight	3588 lbs.	3563 lbs.
0-60 Speed	13.7 seconds	9.5 seconds
Horsepower	124	198
Light-Duty Trucks		
Weight	4155 lbs.	4712 lbs.
0-60 Speed	13.4 seconds	9.9 seconds
Horsepower	146	239

37. U.S. EPA, *Light-Duty Automotive Technology and Fuel Economy Trends: 1975 Through 2008*, http://www.epa.gov/otaq/fetrends.htm.

38. *Id.*

39. McKinsey & Company, *supra* note 13, at 142.

40. U.S. EPA, *supra* note 37.

41. Ken Bensigner, *The Spin on Tires and Fuel Economy*, L.A. Times, May 3, 2008.

Domestic automakers have provided consumers attractive incentives to purchase these larger vehicles. They could do so because their profit margins on these vehicles greatly surpassed those on smaller vehicles.[42]

The purchase of larger vehicles has even been encouraged by federal legislation. Seeking to assist small farmers and businesses, Congress passed legislation during the 1990s that provided tax deductions and accelerated depreciation on the purchase of large (over 6,000 pounds) light-duty vehicles.[43] This subsidy (the so-called SUV or Hummer Tax loophole) was pounced on by those who could qualify for the deduction by claiming that the vehicle would be used for business at least 50% of the time. The loophole still exists, but in a slightly less-generous form.[44]

Many of the same factors that have been highlighted previously, such as population and household growth, also come into play when examining vehicle ownership. For example, there were roughly 130 million registered drivers in 1975, and that number increased to 200 million registered drivers by 2005. If the ratio of drivers to vehicles had remained the same as in 1975, we would have anticipated having a little fewer than 200 million vehicles on the road in 2005. In fact, the ratio changed significantly and instead of 200 million vehicles we have 238 million vehicles on the road. Hence Americans are not only buying larger vehicles, but they are also buying more of them. In a comparative perspective, total ownership of vehicles in western Europe per capita is about at the level where the U.S. was in the 1970s.[45]

The transportation issue, however, is not solely one of vehicle choice or ownership. Americans are driving far more than they were 30 years ago as the growth in vehicle miles traveled has significantly outpaced population and vehicle growth during this time period. This is a function of how we have structured our urban/suburban communities, building homes further from the workplace, underinvesting in public transport, and providing few walking opportunities. As has been noted, our communities have been built on the assumption that people will use cars virtually every time they travel.[46] Many have hailed the recent increase in vehicle mile standards promulgated by Congress in the Energy Independence & National Security Act of 2007, but analysis has shown that the gains we obtain through mandated vehicle efficiency can be wiped out entirely if we continue, as expected, to increase our travel mileage every year.[47]

II. Confronting Supersizing

The previous section has documented the supersizing phenomenon. Over the past 30 years we have built bigger homes, stocked them with a multitude of electricity-draw-

42. Neal Boudette & Joseph B. White, *How Slumping Market for SUV Is Hurting Detroit's Bottom Line*, Wall St. J., May 13, 2005.

43. Internal Revenue Service, *Electing the Section 179 Deduction*, http://www.irs.gov/publications/p946/ch02.html.

44. CCH Tax Briefing, American Jobs Creation Act of 2004: Special Report 3 (2004).

45. Oak ridge National Laboratory, Transportation Energy Data Book 3-6 (27th ed. 2008).

46. Reid Ewing et al., Urban Land Institute, Growing Cooler: The Evidence on Urban Development and Climate Change (2007).

47. Steve Winkelman, "Increase Travel Choices to Reduce Gasoline Demand," Testimony Before the U.S. Senate Comm. on Energy and Natural Resources (July 23, 2008).

ing gadgets and appliances, bought more and larger refrigerators and televisions, and purchased more and larger personal transportation vehicles. Comparisons have frequently been made to practices in western Europe, a region with comparable levels of economic affluence and quality of life indicators. Supersizing is not totally absent in western Europe,[48] but it is most pronounced in the United States. Table 3 succinctly posts some of the major differences that have been highlighted.

Table 3:

	United States	Europe
1) Emissions of CO_2/capita, 2004*	20 tons	10 tons
2) Square footage/capita in household**	$63m^2$	$38m^2$
3) Transportation fuel mileage**	20m/g	27m/g
4) Common refrigerator size***	22cu.ft.	12cu.ft

*Carbon Dioxide Information Analysis Center
**McKinsey, *supra* note 13, pages 65 and 142
***For a discussion, see: www.grist.org/advice/ask/2007/07/23/shortfridges/index.html

The fact that U.S. practices are so out of line with those in Europe can be viewed positively in that the U.S. possesses considerable potential for large-scale reductions in energy usage and CO_2 emissions. Drawing on the rich and increasingly cited field of "hedonic psychology," we know that perceived levels of happiness in the United States and western Europe are roughly comparable.[49] Hence, Europe's limited supersizing has not led to any perceived "happiness deficit" vis-à-vis the United States. Aside from this comparative perspective we can go back in history and see that perceived happiness levels in the United States are no more today than they were 30 years ago prior to the supersizing phenomenon.[50] Given this evidence, therefore, we can say with some certainty that supersizing is not a prerequisite for achieving higher levels of individual and societal happiness. Indeed, some argue that higher affluence—which makes supersizing possible—and the urge to consume, may even decrease levels of perceived happiness (or at least create pleasure that is only short-lived).[51] It is clear, therefore, that the elimination or scaling back of supersizing would not necessarily result in a reduction in well-being. How one proceeds in doing so, however, could be critical to succeeding.

Elimination of supersizing literally means reducing the number and size of the items consumers purchase. A reduction in the consumer ethos, therefore, is the direct approach to fighting supersizing. It is possible, however, to approach the issue indirectly, i.e., through reducing or eliminating the carbon emissions produced from supersizing. In this way, climate change can be mitigated even if supersizing proceeds apace.

Whether one takes the direct or indirect approach to supersizing, the challenge is daunting. Taking the indirect approach, we have to realize that our society is based on an energy system overwhelmingly reliant on the combustion of fossil fuels that produce offending CO_2 emissions. Considerable research and development over the past three decades has gone into creating an affordable and acceptable non-fossil fuel-based system. But progress is slow, and 30-year projections of energy use from conventional U.S. Department of Energy (DOE) sources forecast relatively little in the growth of alternative energy sources.[52]

On the positive side, one-half of U.S. states have now mandated that a certain percentage of in-state electricity come from non-CO_2 emitting renewable resources, and the private sector is marshaling enormous financial capital to further develop clean energy.[53] Moreover, the federal government recently passed an ambitious renewable fuel standard to begin the process of displacing gasoline from our transportation system.[54]

If the indirect approach to supersizing is a major challenge, it pales in comparison to the direct approach. This is because we, as a nation, find it harder to come to grips with social problems than with technical problems. How do we begin to alter purchasing practices when so much of one's perceived identity and well-being is currently associated with these purchases? Bans or restrictions on size that would prohibit supersizing would prove unpopular indeed. Recent media attention to "buying green" typically reinforces the consumer ethos rather than challenges it. Appeals to the general populace to forgo supersizing for the benefit of the planet have occasioned little response to date. Efforts to achieve this in western Europe among a populace more in tune with the message have shown mixed results, at best.[55] Clearly, new approaches linking consumption to its full social cost are needed. Though there is a segment of the U.S. population that would have no problem with the direct approach, and have never "bought into" the supersizing phenomenon to begin with, that segment remains relatively small.[56]

Even if we are far from producing a societal norm against supersizing, we can think of policies that begin moving us in the appropriate direction. Optimally, these policies should combine elements of both the direct and indirect approaches, but serve to illustrate how full social costs can be accounted for in purchasing decisions.

48. European Environment Agency, Household Consumption and the Environment: EEA Report No. 11 (2005).

49. Ruut Veenhoven, Erasmus University, World Database of Happiness (2007), *available at* http://www1.eur.nl/fsw/happiness.

50. Robert J. Samuelson, *The Bliss We Can't Buy*, Wash. Post, July 11, 2007, at A15; Bill McKibben, Deep Economy: The Wealth of Communities and the Durable Future (2007).

51. Robert Frank, Falling Behind (2007); Tim Kasser, The High Price of Materialism (2002); Mark Cohen & Michael Vandenbergh, Consumption, Happiness, and Climate Change (forthcoming).

52. Energy Information Administration, U.S. DOE, Annual Energy Outlook 2008 (2008).

53. Ryan Wiser & Galen Barbose, Renewables Portfolio Standards in the United States (2008); Joel Makower et al., Clean Energy Trends 2008 (2008); *The Power and the Glory*, Economist, June 21, 2008, at 3-26.

54. The Energy Independence and Security Act of 2007, tit. 2, §§201-202.

55. Minna Halme et al., Sustainable Consumer Services: Business Solutions for Household Markets (2005).

56. Maurie Cohen et al., *The New Politics of Consumption: Promoting Sustainability in the American Marketplace*, 1 Sustainability: Science, Practice & Pol'y 1 (2005).

IV. Illustrative Policies for Combating Supersizing

The policies suggested below are intended to represent the kinds of measures we will need to promulgate to address supersizing. One can view them as policies designed to foster or support a norm against supersizing.

As noted previously, one way to combat larger home sizes would be to reduce or eliminate the mortgage tax reduction for homes above a certain size. A more acceptable approach would be to require more rigorous energy-efficiency standards for larger homes. Such standards could be incorporated into well-established energy building codes. The U.S. Green Building Council took step in this direction through its residential Leadership in Energy and Environmental Design (LEED) criteria.[57] An average-size home of 2,500 square feet, for example, needs only to earn 30 points in the numerically based LEED system to qualify as LEED-certified, while a 7,000 square foot home needs 60 points to qualify.[58] Such a home size adjustment factor has been incorporated into law in Boulder County, Colorado. This jurisdiction now requires efficiency standards of 15% to 90% over existing building codes for larger homes.[59]

In terms of major home appliances, such as refrigerators and televisions, greater financial resources should be devoted to publicizing those models achieving the Energy Star® label, i.e., those achieving efficiencies at least 15-20% greater than the industry standard. Moreover, there should be an Energy Star® category for the best of the best, such as Energy Star® Superior. This would create competition among producers to create the best possible models, thereby resembling Japan's Top Runner Program.[60] Finally, local governments need to design active and innovative programs to remove old appliances from households.

As for transportation, a "feebate" incentive/disincentive should be attached to the purchase of light-duty vehicles, such that those emitting more CO_2 come with a surcharge, and, conversely, those emitting less are combined with a rebate. The thinking behind feebates has been developed in a number of papers,[61] and the state of California is currently giving serious consideration to it as part of its suite of policies designed to combat climate change.[62] "Smart growth" policies also need to be implemented, thereby reducing miles traveled in vehicles.[63]

V. Conclusion

We have seen that supersizing has become a pervasive feature of American life, contributing to making the United States a truly singular force for climate change. The contention that bigger is not necessarily better has fallen on deaf ears. If the issue were just one of aesthetics, we could hold interesting debates. Unfortunately, however, supersizing has consequences going well beyond personal taste, as it contributes significantly to this country's carbon footprint.

The connection between purchasing habits and carbon footprints has scarcely been broached in the United States. To the extent that climate change is seen as a serious environmental issue, the culprits are typically identified as large industries and utilities. A conscious effort has been made to avoid discussing any hint of sacrifice that might be needed on the part of the American public. For these reasons, it makes little sense to call for a direct assault on supersizing. Any proposed size restrictions would occasion an outpouring of opposition claiming that consumer sovereignty was being unduly suppressed. Supersizing, therefore, has to be addressed in a more subtle fashion—one which maintains the right to choose, but also incorporates full social costs in the purchase. By making costs real and transparent, we begin to alter the decisionmaking equation that has prevailed for the last 30 years.

None of the proposals suggested in the previous section take away the consumer right to supersize, just as we have not taken away the individual's right to smoke even in the face of daunting medical evidence of the harm it is inflicting. We simply make it more likely that smoking will be voluntarily abandoned. The stigma now associated with smoking is reflective of the social norm that has been produced surrounding this individual behavior. We are simply at the beginning stages of producing a similar norm against supersizing today.

57. LEED is the most robust system today for characterizing "green" buildings.

58. Lisa Prevost, *How "Green" Can a Huge House Be?* N.Y. Times, Apr. 6, 2008.

59. *County Oks Green Building Code*, Boulder County Bus. Rep., Apr. 9, 2008, *available at* http://www.bcbr.com/article.asp?id=92509.

60. *Developing the World's Best Energy-Efficient Appliances*, http://www.eccj.or.jp/top_runner/index.html (last visited Nov. 4, 2008).

61. Walter S. McManus, Economic Analysis of Feebates to Reduce Greenhouse Gas Emissions From Light Vehicles for California (2007); Kenneth C. Johnson, *Feebates: An Effective Regulatory Instrument for Cost-Constrained Environmental Policy*, 34 Energy Pol'y 3965 (2006); David L. Greene et al., *Feebates, Rebates, and Gas—Guzzler Taxes: A Study of Incentives for Increased Fuel Economy*, 33 Energy Pol'y 757 (2005).

62. *California Weighs "Feebates" to Steer Car Buyers*, Greenwire, Apr. 22, 2008.

63. Ewing, *supra* note 46.