PLAN C

Community Survival Strategies for Peak Oil and Climate Change

Pat Murphy

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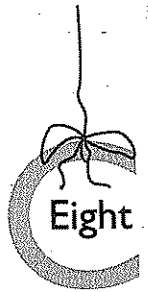


Plan C — Curtailment and Community

The triple threats of peak oil, climate change and increasing inequity are worsening each year. We are told that China is a threat to US survival because China wants a North American lifestyle. Al Gore's movie *An Inconvenient Truth* suggests that our very survival is at stake from global warming.[1] Jimmy Carter in his book, *Our Endangered Values*, says the greatest challenge we face is the growing chasm between the rich and poor people of the earth.[2] And globalization is like an economic plague injuring billions of people. The handwriting is on the wall — massive change is in the offing — but most people are totally unprepared. Four plans, labeled A, B, C and D, describe the current responses to these threats. The proposal I advocate, Plan C, addresses the energy reductions that are needed in the areas where each person has control: the food we eat, the cars we drive and the houses we live in.

Plan A — Business as Usual

Plan A is the most widely discussed option concerning energy depletion and climate change. It is the growth-oriented paradigm obsessed with scientific technology; this model has driven industrialized societies for 60 years, and much of the rest of the world more recently. Individual self-interest is its underlying philosophy, and one of its key theses is the capitalist doctrine of substitution. Substitution means that the world will never run out of resources because the free market will always find an alternative i.e. technology always finds a solution to every problem. Under this philosophy we treat the natural world as a garbage dump. The free market is successful only because it dumps the refuse, toxins and waste of manufactured goods and services into the air

and water as well as on and under the land. Extreme Plan A proponents advocate using anything that will burn to generate energy, regardless of environmental consequences or concern about the availability of resources for our descendents. Proponents of this plan include leaders of most major manufacturing corporations, fossil fuel companies, utility companies and recent presidents of the United States. The fuel sources for Plan A are largely non-renewable oil, natural gas, coal and uranium. In this plan future non-renewable fuels include lower quality versions of oil extracted from tar sands and oil shale in the US and Canada, and the heavy oils of the Orinoco region of Venezuela. A sizable majority of the US population has put its trust in Plan A and a continuing flow of oil from the Middle East. Some Plan A proponents even believe that humanity has little to do with climate change and global warming.

Plan B — Clean Green Technology

Plan B advocates are content with the status quo, particularly their lifestyle, and hope to simply replace non-renewable energy products with renewable ones.[3] Plan B supporters generally accept the capitalist system with its underlying values of competition and infinite growth. They argue that cleaner technology is available; it just needs to be deployed. Sometimes Plan B advocates suggest that corporations and governments have deliberately held new technologies off the market. Representatives of this group include former US Vice President Al Gore, wilderness organizations and many environmentalists as well as solar, wind and biofuels manufacturers. Mr. Gore, in his film *An Inconvenient Truth*, promotes carbon sequestration as a way to shift the economy to *clean coal*, a concept popular with utility and coal companies.[4] Biofuels are a major component of Plan B and are supported by agribusiness companies such as Arthur Daniels Midland and Cargill, large suppliers of ethanol and biodiesel. The environmental movement is the largest identifiable population that supports some version of Plan B. Although this plan also includes efficiency as a key component, its proponents typically ignore Jevons' Paradox, which says that consumption increases as efficiency improves.[5]

The overriding majority of US citizens believe in either Plan A or Plan B. They share basic consumer values, and their preferred green energy projects sometimes overlap. Plan A and B supporters do not see the need for citizens to take any particular action. They do not hold themselves accountable for the energy crisis and climate change. For them, it is the responsibility of government

and corporations to make the necessary changes — *a guilty producer – innocent consumer* perspective.

Plan D — Die Off

Those who endorse Plan D (die off of the race or a drastic population decline) believe it is too late to avoid catastrophe. These people tend to assume there is no viable solution to peak oil and climate change; that economic growth, population and consumption will increase unabated and that humanity can expect economic collapse, chaos, wars and other forms of violence — possibly even mass starvation. Plan D proponents tend to focus on individual and family survival and the need to defend whatever sustainable communities can be formed. Some people dismiss Plan D advocates with flippant remarks or critical labels, but there is reason to take this view seriously, as we may have already passed the carrying capacity of the planet and major population die off is not out of the question. Wars over dwindling fossil fuels, possibly involving nuclear weapons, could occur. The effects of climate change on agriculture, exacerbated by the loss of fossil fuel inputs, could cause widespread hunger and unrest. With our business as usual attitude, Plan D's negative perspective is not unfounded.

Plan C — Curtailment and Community

Plan C assumes that the relatively recent availability of fossil fuel energy (a blip in geological time) has caused a temporary detour in the evolution of humankind. Its view is that fossil fuels have led to a two-century long addictive fascination with oil-based machinery and excessive consumption; and this has led to massive global inequity and potentially catastrophic climate change. Under Plan C, the first priority for society as a whole is to drastically reduce consumption of fossil fuel energy and products derived from fossil fuels. The key action is to *curtail*. That means buying less, using less, wanting less and wasting less. To curtail means to cut back or to downsize. *Curtail* reflects the seriousness of the current situation more than the politically acceptable word *conserve*. Conservation can imply a relatively small reduction in consumption: recycling, buying compact fluorescent lights or maybe a hybrid car. If conservation were used as a synonym for curtailment, it would be appropriate to preface *conservation* with some modifier such as *radical, extreme, deep* or *rapid*. Plan C people are conservers rather than consumers but they view current

conservation efforts as insufficient. This plan implies permanent societal change to reduce consumption of dwindling natural resources in order to control and mitigate climate change. It calls for a resurgence of small local communities as the alternative to the American way of life that must be abandoned. And it accepts a reduced standard of living as part of being a global citizen.

Plan C and Thinking Globally

The popular phrase *Think Globally, Act Locally* is catchy, but it's important to consider the context in which the phrase is used. Corporations and media have a way of taking concepts that were developed at a grass roots level and using them to manipulate people. Some commercially promoted global thoughts are meant to stimulate frivolous and largely irrelevant local actions, such as buying stylish clothing and new model cars. Other thoughts — such as choosing between paper and plastic bags — are well-meaning but are relatively ineffectual; they mostly just make us feel better.

Globalization, one widely discussed global thought, is basically a process where large corporations move manufacturing facilities around the world to obtain cheap labor rates while avoiding as much as possible the environmental and labor constraints imposed by elected governments. Globalization contributes to environmental degradation, increasing inequity (the breeding ground of terrorism) and excessive use of energy. A corporation's global thoughts have little to do with the well-being of people anywhere and a lot to do with shareholders' profits. Thus, corporate global thought is largely contrary to the interests of local communities, a key component of Plan C. In terms of corporate globalization, a good local action might be to avoid purchasing goods from international corporations as much as possible.

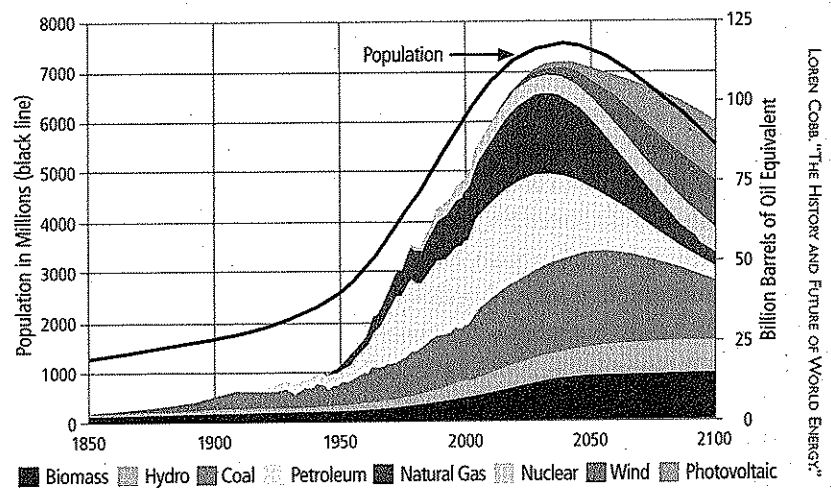
Thinking globally, Plan C advocates might develop awareness of these topics.

1. Increasing economic inequity
2. Increasing climate deterioration
3. An unsustainable world population
4. Excessive use of declining fossil fuels

Awareness of global economic inequity means knowing that the majority of the world's people are living in poverty and that a significant number are near death from starvation. These are more important global thoughts than, for

instance, what country fields the best soccer team or even who should be allowed to join the World Trade Organization. Increasing climate deterioration is simply the result of massive consumption of fossil fuels; and it is fossil fuels that have fueled the growth of globalization. The solution to this is obvious. Population is illustrated in Figure 8.1 which shows the correlation between increasing consumption of fossil fuels and the population explosion which began in 1945. This is the year when the two began to increase in lock step. Declining fossil fuels probably means a lock step decrease in population. Avoiding a too rapid decrease in population is a significant challenge.

A global view should also include a historical perspective. People need to think comprehensively in both space and time. Human beings lived on the earth in a sustainable manner for many millennia. A few centuries ago new sources of non-renewable energy were discovered, starting with coal, followed by oil and natural gas and then by uranium. The standard of living increased rapidly for a very small part of the world's population. And world population began growing rapidly. When cheap and easy fossil fuels became available, the value system of affluent humanity moved from an orientation of community relationships toward the acquisition and consumption of material goods. We were no longer citizens — we became consumers. Plan C brings us back to a focus on community. A needed global thought for today is that we must change from a growing economy to a contracting economy — first because we



Loren Cobb, "The History and Future of World Energy."

8.1: *World Energy Production and Population*

are running out of fossil fuels and second if we continue to burn the fuels we have, climate chaos will result. Plan C accepts the need to contract, while at the same time offering a new way of living in community where economic success is not the principal motivation of society. It seeks to mitigate the worst of possible suffering from the inevitable decline of fossil fuels and population.

The Psychology of Curtailment

There is a strong psychological resistance to curtailment. To Americans, consuming more products and services is the critical measure of both national and personal success — even freedom. A growing economy means affluence, abundance, success and progress; these are the core values of the current society. Curtailment means the economy stops growing and begins contracting; and a contracting economy means fewer goods and services and more limited choices. For Americans this is the opposite of success — it is failure. Changing this perspective will be extremely difficult. But if we look at the big picture — if we think globally — then we will realize that we have been and still are the major nation causing global climate change. We are living in such a profligate way that we are destroying the habitability of the planet and pushing the poor of the world to the edge of survival. Surely making the planet uninhabitable for everyone is the ultimate failure.

What would it take for us to view success differently? As energy supplies peak, the model of economic development that depends on perpetual growth, increased consumption of fossil fuels and other resources will no longer be viable and will have to be abandoned. If we choose to consume less, is there a way to manage and measure such curtailment in positive terms? Even more importantly, are there models of what curtailment might be like? If we were to curtail to Europe's standard — a 50% cut in energy consumption — our cars would get 42 mpg instead of the American average of 21 mpg. Our average house size would be 1,000 square feet rather than 2,400. Instead of mostly single family homes, many houses would be multi-family — much more common in the rest of the world and a style that uses much fewer resources both in construction and operation. Eating more locally and seasonally would be the norm, as would more public transportation, biking and walking. And most of Europe has national health care and excellent public schools, so social systems need not suffer.

However, even Europe's 50% less is still producing too much CO_2 for the planet. NASA scientist James Hanson says that "the safe upper limit for

atmospheric CO_2 is no more than 350 parts per million." He further says we are already past that level.[6] Much deeper cuts are needed to reverse climate change and avoid Plan D. All developed countries will need to make dramatic reductions in their consumption — towards the level of the majority of the world's people — the 85% of the world's population who live on one-seventh the per capita consumption of people in the US. These people have lived much more frugally, within a world of limits, than have the US or Europe. It is not that they chose curtailment as an alternate path; most would prefer to adopt US consumption standards. In reality, many people in the rest of the world are destitute, with minimal access to basic needs. There are two notable exceptions, places which provide adequate food and housing and high levels of education and health care for all citizens. They are the state of Kerala in south India and the country of Cuba.[7] In the past their achievements have been at best curiosities to the rich world, but in the time to come Kerala and Cuba may be invaluable models. Cuba is an especially powerful example, as they already experienced an over 50% cut in fossil fuels in the early 1990's. In spite of the devastating economic collapse that resulted, they maintained basic social services for all sectors of society (particularly important were free health care, education and a basic level of food supplies), and began rebuilding their society on a more agrarian model.

To make the choice to curtail before it is forced upon us (as happened in Cuba) will require an enormous change in our consciousness, both at the government and the personal level. We must go through the kind of transition that Germany did after World War II when faced with the knowledge of its war crimes. People in the US will need to face the damage done by our culture of greedy consumption of limited resources and disregard for other people and future generations.

Giving Up Technology Worship

Plan C advocates are not Luddites, attacking technology and its benefits without discrimination. We are skeptical of the unfounded technology claims that are constantly being sold through the media and are aware of the damage caused by technology and consuming — including the massive amount of greenhouse gases that result. We see the worship of technology as an invisible religion in this historical time — perhaps more fundamental than any other belief. We must question this belief and come to understand and accept that

there is no new invention, technology or fuel on the horizon that can bail us out of our current dilemma. Consumption as a way of being is doomed by the realities of peak oil and climate change. As stated earlier, the material prosperity we are used to (and its related technologies) is simply fossil fuel energy prosperity. The US high energy infrastructure is no longer viable. A reduction in energy means a reduction in technology use and our material standard of living. Any attempt to delay this, in the hope of some miracle that will eliminate the need to curtail, simply delays the actions that all must take to consume less. The cost in human suffering will increase the longer action is delayed.

We naturally hope for some breakthrough technology. But most current machine technologies are quite mature. There are research labs with experts that have been addressing energy shortages for many decades. Oil, natural gas and coal companies have massive research staffs. So do governments and universities. In 2006 Research and Development (R&D) for the top six car companies (Toyota, Ford, Daimler-Chrysler, General Motors, Volkswagen, Honda) was $38 billion.[8] These researchers have been seeking new options in the past decades and will continue to do so in the future. But improvements in efficiency over several decades have only been 1.5 to 2% per year.[9] Car design is mature. Cars of the future will have four wheels, an engine with a transmission and a steering wheel. The same holds true for all transportation vehicles. This technological reality has been obscured by much more rapid developments in electronics whose performance and efficiency have improved at a dramatically faster rate. But electronics has little to do with the ordinary consumption of energy for food, homes and cars. A PC that is a hundred times faster than yesterday's or an MP3 player which holds 10,000 songs will not allow us to continue America's high-energy lifestyle. In spite of the advent of the so-called information economy and all the hype about a knowledge society, Americans continue to consume energy at an unprecedented and unsustainable level. New technology has not helped. We are in a quandary. We can either assume a technological fix will be forthcoming and so choose to do nothing, or begin the personal process of changing our lifestyle. This is truly thinking globally: choosing a healthy planet and a sustainable lifestyle over the short-term pleasures of excessive consumption. Innovative use of current technologies and improvements in machine efficiency will aid us, but must be used to support the necessary decision to give up machine fascination and curtail consumption.

Personal Change and Community

We at Community Solutions have long advocated for small local communities, where towns and villages are interspersed with reasonably sized cities — cities far below the scale of the current ones. As noted earlier, there has been a continuous population movement from rural areas to urban cities. The world urban population has increased four fold from 732 million in 1950 to 3.15 billion in 2005. According to a Worldwatch report, in 2007 almost as many people will live in cities as will live in the country. Urbanization has been sold as one of the benefits of economic growth and globalization. Yet the report notes that roughly one billion of the 3.15 billion city dwellers (one in three urbanites) live in slums.[10] The article "The Second Coming of the American Small Town" suggests the suburb is harmful to children and is not the best place to raise them.[11] A Gallup pole conducted in the US in 1989 asked, "What kind of place do you want to live?" The answers were

Small town – 35%
Suburb – 24%
Farm – 22%
City – 19%.[12]

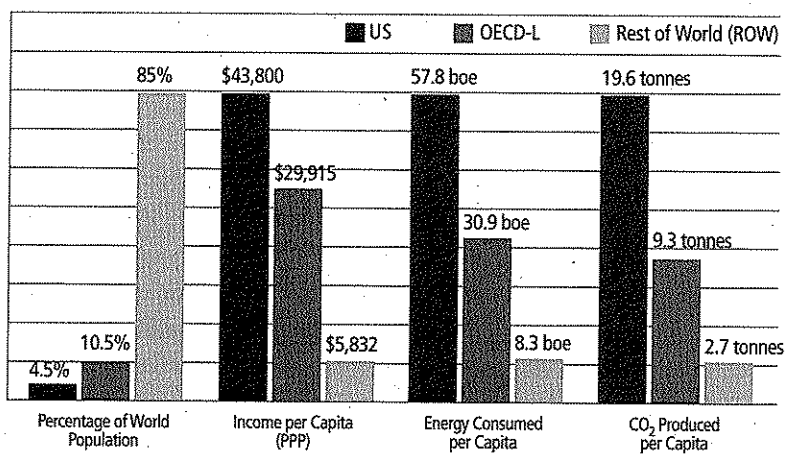
The 22% who chose *farm* is close to the percentage of the workforce that would be required to provide locally grown organic food under Plan C. Thus many people who have been unable to pursue their preferred vocation of farming could thrive on small farms in the future. Currently only 2% of the US workforce is involved in industrial food production.

Developing small local communities and local economies have become popular concepts among those seeking a new future after peak oil. Books and conferences abound on these topics. But this localization movement must be careful not to fall into the trap of the Plan B option, an option which lacks a perspective of the need for limits and which hopes for a solution to support the current lifestyle. There is a risk that people will focus on municipal use of fossil fuels and ignore their own personal consumption of energy. But the energy consumed by a town or city is small compared to the energy consumption of its citizens. It matters little what kind of bus or police car is purchased. A small town will have a dozen public vehicles but thousands of commuter cars. Big changes must begin with personal change.

Household Sector Personal Consumption

The US is consuming far more energy (and other goods) than any other nation. Most people feel helpless to change this. Planning strategies for change requires that we understand fully what part of the total energy consumed in the US is under the direct control of each individual. For example, each person can choose the type of car to drive and the kind of home in which to live. One could buy a Honda Insight that gets 60 miles per gallon or a GM Hummer that gets 10 mpg. Or one might decide to only use mass transportation. One could buy a large home with lots of glass and appliances or a small home designed to conserve energy — or even live in a small apartment. One can eat manufactured foods and foods that have been transported long distances, some by air, or eat foods that were grown close to home.

To be able to make any change, we must know our current level of consumption. For this reason I have elected to concentrate on the energy associated with housing, personal transportation and food, commonly referred to as the household sector of the economy. To begin, I emphasize again the importance of a global view by repeating this Chapter 2 data in Figure 8.2.



DATA FROM US CIA *WORLDBOOK* 2007, IEA *KEY WORLD ENERGY STATISTICS, 2006*

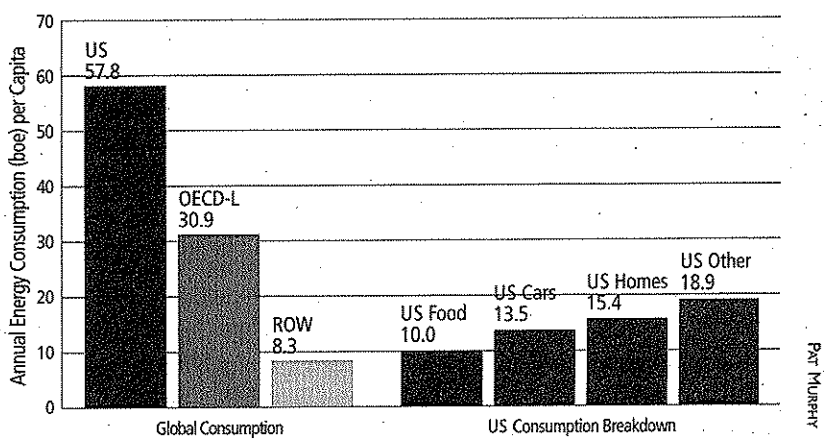
Region	Pop.	% Pop	PPP	BOE/c	CO_2/c
US	300 million	4.5%	$43,800	57.8 boe	19.6 tonne
OECD-L	700 million	10.5%	$29,915	30.9 boe	9.3 tonne
ROW	5,700 million	85.0%	$5,832	8.3 boe	2.7 tonne

8.2: *Income, Energy and CO_2 per Capita — US, OECD-L and ROW*

Of the US total annual energy consumption of 57.8 boe/c (barrels of oil equivalent per person), housing consumes 15.4 boe/c, personal travel consumes 13.5 boe/c and food consumes 10 boe/c — 67% of the total.[13] This is the amount of energy consumed annually that is under each person's direct control.

Figure 8.3 shows the annual per capita consumption of energy for the world. The left three columns show the total amount of energy used yearly by each citizen of the US, each citizen of the subset of the OECD nations I label OECD-L and by each citizen of all the rest of the world's people (ROW). The four columns on the right break down US energy consumption per capita into food, cars, homes and other. The *other* column includes US energy consumption that is not under each individual's personal control, mostly industry, commercial and education. US food, cars and homes account for about 67% of total US energy consumption. Note that energy consumed by US housing (15.4 boe/c) is almost twice the per capita energy that 85% of the people of the world consume for every purpose.

The categories of *other* and personal energy consumption are not independent of each other. Personal levels of energy consumption help to set corporate and governmental levels of energy consumption. For example, suppose every car owner immediately purchased the most energy efficient car possible — a 50-mpg vehicle — replacing his or her 22 mpg car. If we were to combine these purchases with lowering the speed limit to 45 mph (which would provide a



8.3: *Annual Per Capita World Energy Consumption with US Breakdown*

further 25% improvement in fuel economy), per capita gas consumption in the US could drop from 15.4 boe/c to 4-5 boe/c.[14] A 50-mpg car would be half the size of a large car, so the energy expended in its manufacture would be reduced. This reduction would curtail the energy used to mine and smelt iron ore for steel. Driving more slowly would extend the life of highways. Better highway conditions would reduce government energy expenditures for road maintenance.

Similarly, choosing to ride a bus rather than drive a car would impact the transportation industry. Likewise, if we reduce our consumption of household furnishings and a host of other manufactured goods, there will be an impact on the industries that produce those goods. Living in smaller houses would shrink the construction industry, and eating locally grown, unprocessed organic food would shrink the food manufacturing industry and its heavy fossil fuel use. I don't think we can expect government and industry to lead in reducing. A personal reduction in consumption may, in fact, be the only way to shrink government and reduce the power of corporations. People cannot now vote on products that are made, and energy-intensive products mean more corporate revenue and more taxes for government so there will always be powerful forces that counter any attempts at conservation or curtailment. Simply put, by concentrating on the areas within our control and reducing what we consume for food, transportation and housing, we will cause a corresponding reduction in the industrial sector of our society. A commitment to *walking lightly on the earth* could lead to a saner life, with a focus on family, friends and community instead of wealth, consumption and deal-making.

In a few generations, total availability of fossil fuels may be much less than 5 boe per person on the planet — far less than the current US annual per person consumption of 57.8 boe. Yet the vast majority of people in the US are unaware of the magnitude of changes they can make or of the huge disparity of energy consumption between the US and the rest of the world. Nor have we given any consideration to the implications of declining fossil fuels for other people or even for our children. Because of climate change, the long term consumption reductions necessary in the US are not in the range of 5-10% or even 20-30%, but in the range of 70-80%! How can a US citizen continue consuming at the current level in light of this information? Radical management of fossil fuel resources, for an order of magnitude reduction, is the long term requirement. But since North Americans cannot count on the government and

corporations, we must begin by focusing on the energy consuming categories where we have personal control.

Plan C and Food

In the local, high-labor form of agriculture which was practiced for centuries and is still practiced in many parts of the world, one Calorie of labor produced more than one Calorie of food. David Pimentel points out that we now require ten fossil fuel Calories for one food Calorie requiring each person to consume an average of ten boe annually for food.[15] Other research shows that the US spends 17% of its total energy on food,[16] which is also ten boe/c per year for food. This is not sustainable and we must change. Six steps to begin that change are:

1. *Eat less.* Pimentel notes that the average person in the US consumes 2,200 pounds of food in a year, which provides about 3,600 Calories per day. However, humans only need about 2,500 Calories per day, so US food consumption could be reduced by one-third.[17] A side benefit of eating less would be better health. Overeating leads to obesity which can lead to a variety of other diseases. The costly US medical system treats many diseases that are caused by a fossil fuel-rich lifestyle. In a contracting economy, maintaining good health will reduce dependence on expensive medical care.
2. *Change our diet.* This means eliminating foods that are very energy-intensive. Good examples are beverages and snack foods which use inordinately high amounts of fossil fuel in their manufacture. Avoid fast foods and pre-packaged, highly processed foods. The manufactured food industry also contributes to high fuel costs for refrigeration since the North American lifestyle requires that liquids be chilled and food kept frozen. Consider 100 million refrigerators connected to thousands of power plants spewing CO_2 into the atmosphere just to keep hundreds of millions of cans of soft drinks or beer at a constant low temperature! Food corporations play several significant roles in our health. Large food manufacturers can provide extremely dangerous products. Part of wise purchasing is to determine the corporations behind the brands, examine their actions and motivations and purchase accordingly.
3. *Reduce meat consumption* — Meat production creates high amounts of greenhouse gases, so reducing both the volume eaten and eating meat raised in a

different way is important. The consumption of meat per capita in developed countries is almost three times the consumption in the developing world.[18] Unfortunately, the developing world, following our example, has doubled its per capita meat consumption since 1990, leading to more fossil fuel consumption. An industrial meat-based diet takes twice as many fossil fuel Calories as a plant-based one. However, this does not mean the complete elimination of meat. Meat can be provided without using high-energy feeds like corn and soybean meal. Locally grown meats using natural forage are not energy-intensive and are better for our health.[19]

4. *Purchase local organic food.* Buy food produced by local organic producers to the maximum extent possible. Joining a Community Supported Agriculture (CSA) group is important. There are three benefits. First, you are supporting local production and that means less fossil fuel is used to transport your food. Second, CSAs help to convert agriculture from a corporate-based, high-energy consuming model to a more efficient one. Third, CSAs support new farmers, in many cases young ones desiring a farming career. Buying organic food raised locally offers a major reduction in fossil fuel consumption.

5. *Preserve and store food.* Canning or drying reduces the energy used to keep products frozen for months in commercial storage. Combining this with buying local produce for winter storage (like winter squash, onions and carrots), will support local food production rather than buying food grown hundreds of miles away. Preserving and storing your own local food further reduces dependence on large corporations and helps develop local food security. It also allows you to begin to participate personally in how food gets to your table. Learning to can and preserve is easier than learning to farm.

6. *Create a garden and/or a henhouse.* Americans are not as far from the soil as is popularly assumed. Gardening, even if for flowers and not food, is a pastime many people enjoy. Producing your own food or keeping a few hens allows you to actually experience the miracle of food growing on the land. Start small and find what it takes to make a piece of your lawn grow organic tomatoes, or some other vegetable you love. Cuba is a good example. When food and fertilizer shipments stopped, they turned to composting and backyard gardens. By doing this, the people themselves kept starvation at bay as their economy recovered. It is important to raise our consciousness about food production and counter the ignorance that currently colors the US view of nature and its bounty.

In short, people need to eat differently — not just for the planet but also for health reasons — particularly if medical costs continue to rise. We can eat less and reduce meat consumption of industrial animal products. We can buy locally, eat locally and store locally grown produce. We can avoid manufactured and pre-packaged goods to the fullest extent possible. Finally we can replace our fossil fuel intensive lawn with a back- or front-yard garden.

Plan C and Transportation

Thinking out of the box is a mantra of the techno-fix society, but getting too far outside the box is not popular. Every innovative proposal relative to the car is acceptable for discussion except getting rid of it. Owning a private car is a core American value; some would say the car is an American addiction. The US has 5% of the world's population, and 25% of the cars. But US citizens use 44% of the gasoline.[20] The style of private transportation is a major issue in the United States. US manufacturers make large cars in their native land but offer complete lines of small efficient cars to other countries. Americans think that new technology (such as fuel cells, hybrids, electric vehicles or combinations like pluggable hybrids) will be available soon. This rationalization lets consumers continue to buy wasteful cars while lambasting auto companies for making them. At the same time, television's nightly news extols high performance hybrids that get only 24 miles per gallon! There is little political interest in change. The energy bill passed by Congress in December 2007 mandated a mere 40% improvement, which only brings us to 35 mpg.[21]

A step each of us can take is to change to an efficient car — whether new or used — at the earliest opportunity. Hybrid prices and limited availability cannot be used as an excuse; there are many small cars available and more are being introduced every year. These small cars such as the Honda Civic VX (made from 1992 through 1995, which averaged over 40 mpg) or the 60-mpg Honda Insight have been available for a long time. Unfortunately these particular cars are no longer marketed because of lack of customer interest.

The second step is to share rides wherever possible. In 2001, the average trip in the US carried 1.63 persons, including the driver.[22] Increasing the number

of people in a car directly reduces energy consumed and also congestion. By adopting sharing as a value, the huge reduction in energy consumption needed could be quickly achieved. Driving less and more slowly as well as bicycling and walking as much as possible are also important. Developing the Smart Jitney system described in Chapter 11 could reduce energy consumption for automobiles by the 80% needed to help stop climate change.

Plan C and Housing

Like everything in the US since World War II, the *bigger is better* value system has affected housing. In 1950 the average new house size was approximately 1,000 square feet; today it is about 2,400 square feet. At the same time the average family size has decreased from about 3.7 to 2.6 people. Thus the average square feet per person has increased from 270 square feet to 815 square feet, a factor of three times.[23] Style changes have raised the average ceiling height and added more windows, further increasing energy consumption. New appliances have been added to the household, increasing fuel consumed in operating the home. Even though improvements in efficiency have occurred in building structures, in heating and cooling systems as well as in appliances, energy consumption has continued to increase.

The first energy saving step is to live in a smaller space. Smaller homes, particularly multi-family units, use less energy to maintain the same level of heating and cooling. Like food (eat less) and cars (drive smaller cars shorter distances, or walk and bike), living in a smaller space is not an easy change. Each person must begin reducing consumption as she or he sees fit. As the average home lasts more than 60 years, it will take a very long time to convert to more efficient buildings. Some people may be able to simply build a new, smaller, more efficient dwelling. Major home manufacturers do not focus on providing such homes, which means a custom home might be required. It should be super efficient and small.

To date, most so-called green residences are very expensive, one-of-a-kind, architect-designed homes. Green building, like new technology for cars, obscures the fact that it is not technology but personal will that is needed to bring about change. Like our cars, our homes are too big. The cars get lousy gas mileage, and houses are too poorly insulated for today's energy reduction requirements. But new buildings alone cannot provide the energy savings required to stop global warming. A more important need is for retrofits of

existing homes and buildings to dramatically reduce energy use for homes by 80% using the German Passive House techniques. This may call for another New Deal as the cost to do this nationwide will be massive.

Values and Actions for the Future

A basic societal transformation is needed. At present the US is choosing war and the use of military power to continue consuming fossil fuels. To reduce the threat of resource conflicts and save ourselves and the planet, the US needs to change its three principal values of competing, hoarding and consuming to values of cooperating, sharing and conserving (or curtailing). These latter values are easier to implement in small local communities where people know each other and have a history of working together. To usefully *think globally, act locally* Americans must cooperate both at home and abroad in finding just and equitable solutions to the challenges of peak oil, climate change and inequity. By thinking this way, we can choose to bring life systems on the planet back into balance so that humanity and other species can survive. The first steps are personal ones — changing the American way of life to one that uses as little energy as possible, keeping in mind the welfare of our children and generations to come.