

## Americans, with 100 'energy servants' each, share blame for Gulf oil spill

Contributed by Sarah (Steve) Mosko  
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There's no shortage of finger pointing as the now worst oil spill in U.S. history continues its assault on the Gulf Coast's ecology and economy.

A USA TODAY/Gallop Poll taken in late May, for example, found that 73 percent of Americans feel that BP (British Petroleum) is doing a 'poor' or 'very poor' job of handling the crisis, and 60 percent evaluated the federal government's response in the same unfavorable terms.

Confronted with images of birds swathed in crude oil and prognostications that the Gulf region's fishing and tourism industries might never recover, the urge to form a posse, so to speak, to rout out those responsible and hold them accountable is all too human.

But are we Americans shocked enough yet by the enormity of this calamity to own up to our personal role in it? After all, it's ultimately our nation's energy-intense lifestyle and attachment to fossil fuels that gives companies like BP and our government the implicit go-ahead to pursue oil at the risk of the very kind of disaster now ensuing.

Unless you're a physicist or energy wonk of some sort, hearing that the average yearly per capita energy consumption in the United States in 2008 was 337 million Btu probably tells you little about your energy footprint. Knowing that a Btu is an energy standard equivalent to 252 calories -- about what's contained in a Snickers candy bar -- is probably of little help either.

That's why Professor of Physics Richard Wolfson of Middlebury College has been giving demonstrations for the last decade which impart a real gut-level, hands-on feel for the energy it takes to support the typical American lifestyle.

His demonstration is simple but ingenious. A volunteer is asked to turn a hand crank which, through a geared system, drives an electric generator connected to two 100-watt incandescent light bulbs.

The upshot is that a typical person can turn the crank fast enough to light one 100-watt light bulb, but not two. To add to the muscular feel for the effort required to turn the crank, Wolfson points out that it takes roughly the same energy output as doing deep knee bends at a rate of one per second.

The lesson is that the energy or work output of a human body is about enough to keep just a single 100-watt bulb lit. Wolfson conceptualizes this amount of energy output -- 100 watts -- as one human 'energy servant.'

The question then posed is how many such energy servants does it take to power the typical American lifestyle?

Answering this requires some simple math, starting with the yearly energy consumption of 337 million Btu per capita which is equivalent, in more familiar units, to 99 thousand kWh (kilowatt hours). Dividing this by the number of hours in a year tells us that an American typically consumes energy at an average rate of 10 kW which is equal to 100 human energy servants (i.e.  $100 \times 100$  watts).

This is Wolfson's message: The average U.S. resident enjoys a lifestyle requiring the equivalent of 100 personal energy servants cranking away 24/7.

This is just one person's share of what it takes to heat, cool and light our homes, fuel our cars, cook and refrigerate our foods, and run our home appliances plus that individual's portion of the energy that makes possible the many shared benefits of our society that do not show up on home gas and electric bills – like the energy used to grow and transport foods to market and to produce all manufactured goods.

It's obvious that a person is not drawing on 100 energy servants all the time. For instance, it takes roughly 750 energy servants to keep a typical gasoline car traveling at a speed of 50 mph compared to, say, two energy servants to power a 40-inch TV. But, 100 is the number of energy servants working day and night on one's behalf when energy consumption is averaged around the clock.

The high standard of living Americans enjoy only partly explains their high energy consumption. Europeans enjoy a similar standard of living but use the equivalent of only 49 energy servants. The world average is fewer than 25 energy servants per person.

A century ago Americans consumed energy at less than one-third the current rate.

The American lifestyle, still powered more than 85 percent by fossil fuels, has much to do with the BP oil disaster: After all, BP was just doing for us the dirty work of finding a new cache of energy servants.

Americans deserve blame for failing to conserve energy far more than we do and for not demanding of both the government and industry that the nation convert rapidly to renewable energy sources like, solar, wind, biomass and geothermal. Failure to do so could mean the unthinkable, that the Gulf oil spill will soon enough fall to second or third place among the worst oil disasters in U.S. history.

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Other articles by Mosko on Culture Change: No Such Thing as a Green Lawn, Fewer Toxins in Toyland, and Serving plastics for dinner? Unhealthy and avoidable (within "Plastics Keep Coming after You: a Comprehensive Report and a Call to Action")

This article appeared in Surf City Voice, June 16, 2010, Orange County, California, and subsequently on Mosko's website boogieggreen.com.

Culture Change editor Jan Lundberg commented on the article for BoogieGreen's webpage:

Hi Steve,

You did a great job with this energy-slave article. Congressman Roscoe

Bartlett, R-Maryland, has done many such comparisons of energy use and human power in his innumerable peak oil presentations.

I believe your last paragraph gives too much credit to techno-fixing the petroleum lifestyle. It turns out that renewable and alternatives forms of energy cannot substitute much for petroleum's energy or petroleum's infrastructure. So it's far more essential to pursue energy curtailment on all levels -- especially when we picture what's happening in the U.S. Gulf and with the global climate. And there's those oil wars on the other side of the world that we don't want to think about.