The Soft Audit: A Human Approach to Energy Conservation

by Richard Karg

The "hard" audit is a dated concept that is characterized by analytical accuracy, technical wizardry, and the assumption that people make rational economic choices. A Maine utility has had success with a "soft" audit that emphasizes psychological considerations.

Most analysts agree that the audit process has not motivated homeowners to pursue energy conservation strategies to the degree that was initially expected.[1] What went wrong? Should the residential energy audit be eliminated as a method of selling energy conservation because of poor results, or will an overhaul make it a viable tool?

Most of us are familiar with the sequential tasks that an RCS energy auditor performs at the home. These tasks include an interview with the homeowner; measurement and data collection; data entry; data analysis and calculation, by hand or with the help of a computer; and communication of the results to the homeowner, either orally, in written form, or both.

This type of audit was intended to offer reliable information to homeowners with which they could make rational decisions about energy conservation. The process was designed by engineers who assumed that the homeowner would indulge in energy conservation if given an abundance of analytical information about all the possible energy-conserving options, the costs of each, and the respective payback periods. The audit was based on the *rational-economic model.* It can be called a "hard audit". It is characterized by analytical accuracy, technical wizardry, and the assumption that people make rational economic choices. For the most part, however, the audit ignores obvious social and psychological considerations. As a result, a large percentage of homeowners have not taken action, and the predicted decrease in energy use has not occurred.

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The Soft Audit in the Field

Maine residents have had experience with both a hard and a soft audit. The hard energy audit was first used in this state by Central Maine Power Company (CMP) in 1980. The audit was based upon the rational economic model: the homeowner was expected to take action based upon the numbers listed in the computerized audit report, returned to them by mail. A study of 3,000 homeowners conducted by CMP in 1983 found that 58 percent had done something to conserve energy as a result of the hard audit.

CMP has also been responsible for the first soft energy audit to be used on a wide scale in Maine. This pilot program, conducted in 1986 by Western Maine Energy Resources (WARMER), included an audit using a portable computer and methods emphasizing interaction with the homeowner. The audit report was calculated and written in front of the homeowner, and their participation in the audit process was encouraged. A preliminary study, conducted in early 1987 by WARMER, showed that approximately 80 percent of the homeowners receiving this audit had already implemented some conservation measures. This was a significantly greater response rate than achieved with CMP's hard audit (see Figure 1).

The following sections of this article are based largely on work done by researchers at the University of California, Santa Cruz.[2] They discuss some psychological concepts that can be used in successful training sessions and workshops for residential

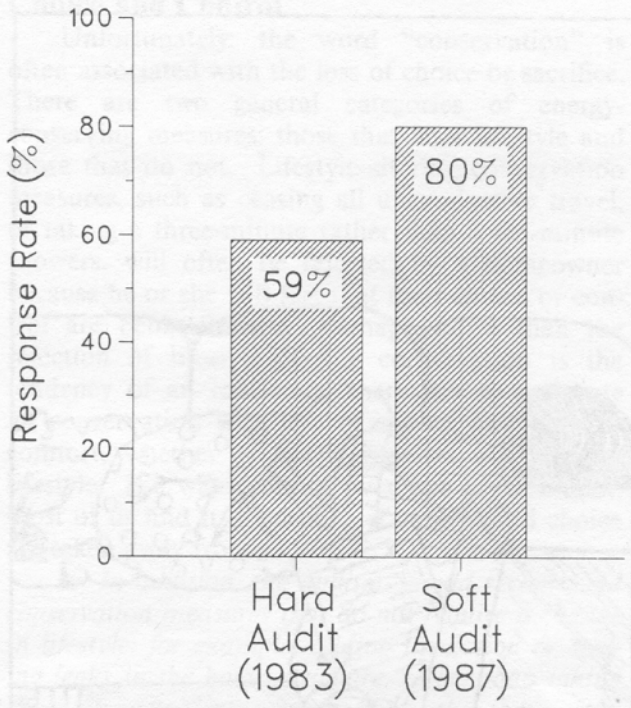


Figure 1. Central Maine Power energy audits. The figure shows the results of studies conducted in 1983 and 1987 on the relative success of "hard" and "soft" audits, respectively. A positive response indicates that the homeowner took some energy conservation measures after the audit.

energy auditors.

Personal Information

People tend to assign a higher value to information presented face to face than to impersonal statistical studies. A couple of examples illustrate this idea.

Assume that John and Nancy Cartwright intend to buy a new car, either a Ford Bronco or a Chevy Blazer. That Friday Nancy visits the library to study *Consumer Reports* and other publications to determine which car is a better buy. On Saturday morning she and John discuss the information she has gathered and decide to buy the Chevy on Monday—a rational choice. At a dinner party Saturday night, they tell their friend Steve Chatfield about their imminent purchase. Steve has a brother who bought a Chevy Blazer a year ago and tells John and Nancy about all the trouble his brother has had with his Chevy, including a new rear end, a bad fuel pump, and poor service from the local Chevy dealer. Steve finishes his speech by saying, "My brother will never buy one of those pieces of junk again."

The Cartwrights buy a Ford Bronco on Monday.

Rationally, the information given to the Cartwrights at the dinner party should not have been given as much weight as the repair records gathered by *Consumer Reports*, but they acted irrationally—not necessarily a bad thing to do, just human.

The auditor should not just leave an audit report behind, but should explain the report and relate the information in a manner close to the homeowner's experiences. For example, use the homeowner's utility bill statements rather than those of a fictitious house. Identify and discuss "super conservers", especially if the homeowner might know them. The audit process, including presentation, should be made as vivid and personal as possible.

☛ *Energy auditing tools can help make the audit more interesting. A blower door and a smoke pencil are much more vivid than rattling a loose window. An infrared scan and videotape are more vivid than an equation showing the savings from insulation, especially if a scan of the homeowner's face—and those of her family—are included on the video tape.*

Energy Loss Vs. Energy Gain

People respond more seriously to a loss than to a gain. We are more likely to take a risk to avoid or minimize loss than we are to enjoy gain. The degree of joy when winning $100 usually is less than the degree of stress we feel if we lose the same amount.

☛ *Homeowners should be shown how much they lose each month by not investing in energy conservation rather than how much they will save if they invest.*

Interpreting Complex Information

Determining the wisdom of a retrofit is a tricky task, and people don't consider all the items they should when making a decision. Their final decision is often faulty because it is based on incomplete information. For example, a study done in the early 1980s revealed that few homeowners, when asked to calculate the payback period for energy conservation measures, considered the increasing cost of energy. Therefore, they underestimated the savings from the measure.

☛ *The auditor should present complex information in a clear and complete manner. Don't make the assumption that the homeowners will calculate the bottom line themselves. Include items such as tax credits and inflation factors, and be ready to explain your methods with clear, understandable language.*

Keeping Up With the Joneses

The example set by others—known as model behavior—is often the most effective way to motivate people to take action. It follows that as

more people act, there are more and more models. Therefore, action increases at an increasing rate.

Two researchers conducted an experiment to demonstrate this principle, called social diffusion. They observed shower-taking behavior at a college athletic facility. They placed an obtrusive sign in the changing room instructing the men to save energy by turning off the showers while soaping up. Their observations showed that 19 percent of the men followed the request. Next, they asked a student to shower and turn off the water whenever others were in the shower room. Compliance with the energy-saving request increased to 49 percent. Finally, they asked *two* students to do the same thing—act as models for energy-conserving behavior. Compliance increased again, this time to 67 percent.

☛ *Respected and well-known residents within a community should be used as models for energy conservation. These "conservation stars" help enhance the social diffusion of energy conservation awareness.*

The Myth of Lowered Self Esteem

Self esteem must result from energy conservation if we expect people to take action. Unfortunately, thoughts of energy conservation often *lower* self esteem.

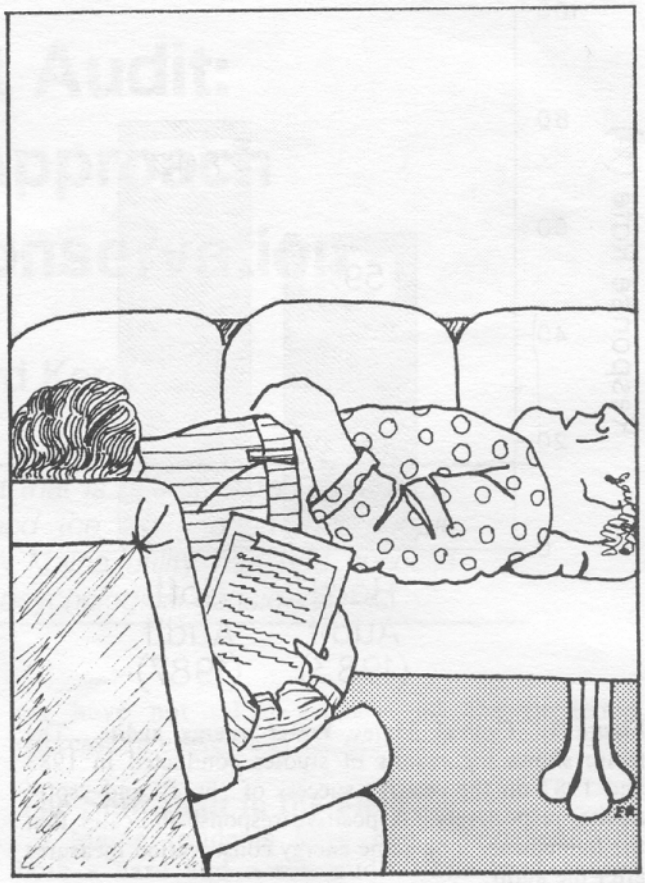
For example, for some people who grew up poor, turning the thermostat to a lower setting might lower self esteem ("Why should I turn the thermostat down? I can afford the extra energy!"). All of us need to feel that we have "made it" or risen above our past impoverished or disadvantaged existence. If energy conservation gets in the way of these "made it" notions, whether they are real or imagined, we cannot expect people to act in a manner that saves energy.

The term "energy efficiency" is more likely to foster self esteem than "energy conservation." Similarly, "energy-efficient showerhead" is a more positive label than "low-flow showerhead." Perhaps we could say that consuming less is like being slim and trim. This would enhance the image of energy conservation in the eyes of most North Americans.

☛ *Enhanced amenity should be a laudable goal of energy conservation. The homeowner should never be chastised for a high thermostat setting or taking long showers. (This is often termed the "rebound effect". The use of the word "take-back" for this phenomenon by utility and energy planners should be banned!)*

Conflicting Notions

If a person holds two perceptions that are psychologically inconsistent, he will feel discomfort. This discomfort can prevent people from taking action, but it also presents an opportunity to use an important motivational tool—the "foot-in-the-door" technique.



So tell me, Fred. Why do you think you haven't been getting along with your water heater lately?

For example, you know that replacing your oil burner will save you money and pay for itself within three years. You also know that the new burner will cost you money that you just cannot bring yourself to spend. This conflict makes you uncomfortable -- you feel uneasy about not making an investment that you know could save you money.

An energy auditor comes to your home to do an audit. She asks you to help perform an efficiency test on the burner. This is the foot in the door. It helps you feel that you are a person actively interested in energy conservation. This relieves your discomfort about spending the money, and you take action.

☛ *Get people to commit to a small action or to make a small commitment to energy conservation. One small commitment might end up having a disproportionate positive effect because it tips the scales.*

Choice and Control

Unfortunately, the word "conservation" is often associated with the loss of choice or sacrifice. There are two general categories of energy-conserving measures: those that alter lifestyle and those that do not. Lifestyle-altering conservation measures, such as ceasing all unproductive travel, or taking a three-minute rather than a ten-minute showers, will often be rejected by a homeowner because he or she will feel that their choice or control are being limited. Perhaps worse than the rejection of lifestyle-altering conservation is the tendency of an individual thereafter to associate *all* conservation with loss of choice, and perhaps comfort, whether or not it requires a change in lifestyle. We want control over our environment; most of us find it demeaning if control and choice are taken away from us.

☛ *In addition, the auditor should recommend conservation measures that do not require a change in lifestyle: for example, adding insulation or sealing leaks in the house structure, rather than taking shorter showers or turning down the thermostat. Explain to the homeowner that the recommended conservation measures will save energy* and *increase their level of comfort.*

Recommendations

Most of us understand the dollars and cents of energy conservation and energy efficiency. We sell our wares—whether they are hardware, software, energy audits, or energy services—on the grounds that they will pay for themselves in three years, five years, or perhaps seven years. We calculate and then calculate again. This way of thinking, or mind set, is vital to the success of our work, but it can (paradoxically) also contribute to our downfall. It can lure us to the complacent belief that all our clients need is a simple dollars and cents explanation to convince them to buy energy conservation and energy efficiency. Of course, for some this has been enough. But for the majority more is needed. We must examine and use social and psychological methods, as well as rational and economic methods, to sell energy conservation and energy efficiency.

Footnotes

1. The National Energy Conservation Policy Act of 1978 created the Residential Conservation Service (RCS) Program. This program required—and still requires—major electric and gas utilities to offer a variety of services to their residential customers, including the audit. A 1986 report by the Government Accounting Office concluded that fewer than 6 percent of eligible U.S. households have had an RCS audit since 1978.
2. Yates, S. and E. Aronson. "A Social Psychological Perspective on Energy Conservation." *American Psychologist*, 38: 435-444, 1983.