Reducing Energy Consumption

The following is a summary of what we know about the conditions under which people make decisions, change their behavior, and the relevance of this information to energy consumption. The summary draws on research from the fields of economics, sociology, psychology, and their related sub disciplines (e.g., behavioral economics, environmental psychology, social psychology, network theory).

1. There is currently an **energy efficiency gap**.[1] This means there are current technologies, which are economically viable (short payback period), that can reduce energy consumption and greenhouse gas emissions. The gap refers to the fact that the technologies are not used because people don't know about them (lack relevant information), have limited access to capital to use them, or do not believe the incentives to use them are sufficiently attractive.
2. People do not make rational choices.[2] Most people, most of the time, do not have sufficient information (about markets, financing, etc.) to make rational choices about energy consumption. Therefore, simply presenting information about energy choices, climate change, costs, amortization rates, etc., will not cause most people to change their behavior. "It's good for you and good for the planet," will not motivate people.
3. People can only worry about a limited set of factors at any given time. The things most people worry about relate to food, shelter, economic welfare, and health. Energy use and climate change are far down on the lists of things that consume people's attention. Issues related to climate change and energy consumption must be linked to the issues that most concern people.
4. People focus on short term, not long term, threats. Energy reduction campaigns need to focus on short-term gains and sort-term benefits for a household. Focusing on what will happen in 50-100 years will not be sufficient.
5. More information about the complex nature of energy consumption and rapid climate change will not necessarily lead to the desired outcome---less energy use.
6. Most consumption behavior results not from rational deliberation but from automatic responses or emotional responses.
    - We do something one way, because we've always done it that way. Therefore, simply changing default setting on thermostats, washing machines, etc., will change consumption behavior.
    - Because our decisions are driven by emotions, selling comfort and fulfilled desires can motivate homeowners to renovate their home better than the prospect of energy efficiency. (Wilson and Dowlatabadi, 2007: 175).
7. People constantly receive conflicting messages about which actions they should take. We are told to save energy at the same time we are encouraged to purchase new technologies (computers, cell phones, etc.) or inefficient technologies (large SUVs that destroy the environment while transporting us into "nature.")

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[1] See the exceptional work of Charlie Wilson and Hadi Dowlatabadi, "Models of Decision Making and Residential Energy Use," on which this summary draws. The Annual Review of Environment and Resources 2007.32:169-203.

[2] I realize of course that some people have, according to rational choice theorists, all of the information needed to make informed decisions. But the data clearly show that in the real world most people act on the basis of limited information and, not infrequently, information that is incorrect.

8. People need to have a pathways to efficiency pointed out and need to be encouraged to take small steps toward reducing their carbon footprints.
    - Raising awareness alone will not lead to action. Mass media campaigns are good for raising awareness, not moving people to action.
    - People need to be given appropriate information and the tools to move toward action; there are different stages in the decision-making process. People have to understand the benefits of each step or stage.
    - There need to be feedback loops created that help to reinforce the behavior desired, e.g., comparison with others who use energy, an energy bill that makes it clear how energy is being consumed in the home, advice about how to reduce energy consumption.
9. People do follow leaders. Social feedback is critical.
    - Early adopters need to be identified and their actions outlined for others. Key community leaders need to be identified, "Who is driving a Prius?"
    - There need to be demonstration projects from which people can learn, e.g., "zero-energy" homes.
    - Barriers to adoption, as opposed to drivers of adoption, need to be identified. They are not the same thing. A barrier to the use of solar panels on a residential rooftop is that most people would need to get a second mortgage to do this. Rising energy prices and tax incentives are drivers, but they may not solve the problem. Instead of tax incentives, government sponsored low cost loans to install solar panels should be considered.
10. Information is diffused through social networks. Social networks must be employed if change is to occur. Energy reduction programs should concentrate on dense networks, whether they are found in churches, unions, fraternal organizations, or bowling leagues.
11. Information is more readily diffused, if the source is regarded as trustworthy and credible. Effective information is therefore simple, personally relevant, and easily comparable. (Technical and factual is less helpful.)
12. People must know how their behavior and their energy use are related. Differentiated energy bills are important, as are visible meters that allow instant feedback.
13. Our use of energy is socially constructed. How much energy we use depends on social and cultural norms. Energy use is embedded in cultural practices, style-of-life choices, and social context. These conditions must be taken into account in developing energy-reduction programs.
    - Price is not a primary driver of behavior. (It may be if the price shock is great enough but a study of real time pricing showed that an increase of 8:1 (peak, off-peak load), could account for only 11% of the change.)
    - Our demand for energy needs is shaped by our concepts of cleanliness and comfort---washing machines, refrigerators, freezers, vacuum cleaners, dishwashers, heating, cooling, lighting, etc.
    - Much of our energy use needs to be understood as embedded---locked up in habits of child care, cooking, mobility, etc.
    - Embedded energy use differs by household type and therefore energy programs need to be directed at households, not individuals.

14. Technology alone is not going to save us. Not all of our technologies have lead to lower energy use. On the contrary such things as air conditioning and furnaces changed the design of homes, and eliminated many energy-saving features, e.g., room size, verandas, overhangs, thermal mass, etc. Space heating and cooling accounts for 50% of all home-energy use.

15. Programs to change energy consumption need to focus on social norms for energy use. "Interventions should. . .shift in focus from energy efficiency technologies to energy service provision. . . It is not energy efficiency investments that sell weatherization but comfort, health, and noise reduction (189).

16. There is no silver bullet. Campaigns to reduce energy use must be multidimensional and should include a focus on:

    - Health.
    - Safety.
    - Convenience.
    - Cost.
    - Household practices.
    - Simplicity.
    - Networks as modes of communication for change.
    - Clear pathways with strong feedback loops.