Panel 1 Introduction

Human Dimensions of Energy Consumption

This year's Summer Study takes place in the context of seemingly plentiful energy supplies, but energy supplies that are increasingly recognized as environmentally damaging. If energy use is inefficient, society suffers more energy-related pollution than otherwise, even if environmental costs are internalized. The concerns over $C0_2$ emissions and their believed contribution to global climate change provide a new reason to ask whether society is using "too much energy. "

Within the Summer Study, the Human Dimensions panel addresses social, cultural and behavioral questions involving energy efficiency. This year, it also has a strong representation of economic perspectives, and it also expands to address some of the broader issues of strategy for energy efficiency.

From an economic perspective, society can reduce economic efficiency by introducing either too little *or* too much energy efficiency. All of us pay more if society imposes policies that "force" changes in energy use that consumers would not make, even with perfect markets. On the other hand, if pervasive market failures lead to considerably more energy and fossil fuel use than is economically optimal, then pollution and emissions of $C0_2$ are correspondingly too high. And we believe that even if these environmental costs were somehow internalized in the cost of energy, the market failures would be likely to still exist.

Should we try to intervene in the energy market to increase efficiency? Some of the papers in this panel focus on the results of interventions. Consider other consumer products. Interventions in the food market are usually for health and safety or to require unit pricing. Interventions in the housing market are few, although lenders do impose some requirements on buyers and even sellers. But there are few ways in which a dollar of a consumer's money can create so much environmental havoc, real or potential, as with expenditures for energy. We suspect that there is a very real need to expand both the "objective" part of this debate, for example, whether there are market failures or barriers to energy efficiency, as well as confront a more ideological debate that underlies some discussions at the ACEEE meetings, namely, whether society *should* intervene in the face of potential market failures for energy efficiency. This volume cannot settle that question, but we hope that by shedding light on the human dimensions of energy use, we can stimulate the larger debate over what society should do.

The panel begins with a "Spotlight" session addressing trends in Human Dimensions of Energy Consumption. Greening discusses how an increasing consideration of social and cultural factors can be reflected in normally-delimited techniques of economic forecasting. The two of us (Kempton and Schipper) make the case for expanding the research agenda of the Human Dimensions panel beyond questions of equipment choice and building operation to cover major consumer choices (say, residence type and location) and broader changes in lifestyle and culture.

Understanding how people understand energy consumption and conservation is fundamental to improving energy efficiency. In the second session, "Energy Knowledge and Education," Harrigan and Gregory rigorously measure savings from an energy education program. Compared with the type of physical weatherization program more commonly evaluated at this conference, they find their energy education to realize savings of about the same magnitude, and after three years, about the same persistence. Also in the areas of energy knowledge, a paper by Wilhite analyzes the specifics of household energy information gathering and decisions.

Some issues, though dealing with economic concepts, are broader than most economic analyses. Such issues have often been brought up in discussions at the Summer Study, but have not been well covered in papers. This year, in a session we call "Meta economics," we invited a series of papers on some of the more controversial of these broader issues: "bounded rationality" (Janda), market failures (Sanstad and Howarth) and the question of whether consumers really do underinvest in energy efficiency (Golove).

Neither consumers nor authorities can hope for improvements in energy use without clear analysis of consumption patterns. Our session on end use analysis includes three studies aimed at understanding social and behavioral aspects of electricity use: Rosenberg on a low-income service program, Balakrishnan on shower-use patterns, and Hall, Hungerford and Hackett on barriers to alternative cooling methods.

The session on "free riders and take-back" addresses the problems that energy efficiency program participants may take some efficiency savings back in the form of comfort (take back) or may accept payment for efficiency that they would have done anyway, without any incentive (free rider). Papers by Chi, Wendell and Buller rigorously evaluate energy efficiency programs for these problems.

"Social marketing" is the idea of using traditional marketing tools to encourage socially- or environmentally -responsible behavior. Given the amount of discussion of social marketing at the 1992 Summer Study, the community seems to have reached the conclusion that the idea could apply to energy efficiency as well. Of the many abstracts received on this topic, we picked ones by Vories and Rosenberg, Auch and McDonald, and Kiefer, LeBlanc, and Feldman to describe programs and ideas relating to social marketing and market transformation for energy efficiency.

This year's Summer Study encouraged each panel to have one session as an "Interactive session, " intended to have shorter presentations and more extensive discussion. We have allocated this session for three papers which discuss the larger context of Human Dimensions. Rockwell and Rose discuss the possibility of sustained changes to customer and social behavior, from a utility perspective. Morrill proposes alternatives to our whole approach to buildings energy efficiency, and Megdal tries to estimate the total social benefits of low-income energy efficiency, benefits which she argues have typically been underestimated. We encourage participants to read over these papers in advance, and look forward to a lively discussion.

One of us (LS) has argued that energy efficiency in housing should be viewed as a housing, not an energy problem. In this spirit we offer three papers aimed at the housing sector, including Christensen and Lutzenhiser with two perspectives on why current housing markets deliver low energy efficiency, and an interesting report from Samson on implementing energy efficiency programs for housing in Krakow, Poland.

The final session concerns utility programs. Gustavsson does a thorough qualitative analysis of energy efficiency in one Swedish utility, showing how the corporate culture can resist energy efficiency innovations. Kushler examines the institutional behavior of utilities when they were given an incentive by state and then later had that incentive removed. Finally, Obstfeld outlines the difficulties in taking a successful utility saturation-coverage conservation program designed for low-income neighborhoods, and trying to apply that experience to higher-income neighborhoods.

The human dimension of energy use covers a broad sweep, from how consumers use information in decisions, to how utility employees conceptualize and implement efficiency, to future cultural drivers of energy demand. But whether the topic is market failure or social marketing, whether it is bounded rationality or the search for sustainable lifestyles, this panel shows that understanding the human dimension will be essential to progress in energy efficiency.

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