# Panel 8 Introduction

# Human Dimensions of Energy Consumption

''Human Dimensions of Energy Consumption'' covers social, cultural, and psychological factors in energy consumption and energy efficiency. We include in this topic papers dealing with psychology and perception of comfort, energy use and energy labels, consumer choices regarding energy, institutions involved in building construction and maintenance, cultural differences across nations, and a few marketing studies.

## Cross-Cultural Comparisons

Three studies concern cross-cultural differences in energy consumption. Wilhite, Nakagami, and Murakoshi study the changing patterns of air conditioner purchase and use in Japan, including the ways in which advertising has appealed to changing Japanese cultural norms. Erickson examines energy and environmental awareness in two small towns, in Sweden and the United States, comparing energy and environmental actions, concerns, and desire for governmental action. Schipper compares energy use and greenhouse emissions from travel across countries of the OECD (Japan, United States, and Western Europe), and discusses the change in travel behavior and the relationship between lifestyle and travel.

## Institutionalizing Efficiency

Institutional level processes are considered in three papers. duPont and Lord report the results of their study of how policymakers' understandings of consumer behavior shape policies and affect program success. Schwartz examines long-term trends in U.S. energy efficiency policymaking and program design, with particular attention to the political vulnerabilities of state energy offices. In a contrasting European case, Nielsen et al. show how Danish policy has institutionalized the promotion of energy-efficient lifestyles.

## Cognition, Perception, and Energy Use

A third group of papers deal with consumer perceptions and knowledge about energy. Parece, Michelman, and Bhagani compare commercial and industrial customers' perceptions of electricity end-use consumption with that of audit-based estimates, pointing out that customer efficiency decisions are often based on perceptions of electricity use rather than actual end-use data. Egan, et al. describe experiments with different types of graphics that allow gas and electric customers to compare their use with that of neighbors, as part of a program providing advice to utilities on how to put such comparison graphs on bills. Scherzer discusses the need to include customer education along with installation of physical energy efficiency measures in households.

## Lighting and Social Life

Two papers focus on the perceptual and behavioral side of energy use in the case of lighting. Pigg, Eilers, and Reed study how office workers interact with active lighting, specifically occupancy sensors and dimming controls, and how these interactions drastically affect the potential for energy savings. Marking a departure from the typical ACEEE Summer Study analysis, Moezzi provides a historical account of electric lighting, showing how lighting has taken on a whole set of meanings besides illumination, meanings that are likely to enter into lighting retrofit programs.

## Analysis of Building Contractors

Three papers analyze the building industry rather than the more common focus on buyers and building occupants. Vieira et al. survey Florida air conditioning contractors to determine the methods actually used for sizing air conditioning. Shove and Raman use interviews to examine the establishment of an energy efficiency building code, showing how the intentions of

government regulators are modified and negotiated in interaction with the industry they seek to control. Lutzenhiser and Shove compare energy research management in the United States and United Kingdom, finding that an unintended consequence of both forms of research organization is to limit effective interdisciplinary research.

## Cooling and Culture

Six papers investigate the institutional and behavioral dimensions of cooling. Diamond, Remus, and Vincent explore the ways in which equipment design, user understandings, installation, and occupant behavior influence the success of evaporative cooling retrofits in public housing. James, et al. consider the effects of thermostat management on energy savings thought to result from the use of ceiling fans—concluding that these may be largely ''hot air.'' Parker et al. also focus on the issue of control in their efforts to explain wide variations in cooling energy use in similar low-income dwellings in Florida.

Based on detailed measurements, White and Wilcox offer a general model of cooling energy use in new California homes that incorporates both behavioral and technical factors. Brown et al. argue that the principle of ''exceedence''—an often overlooked feature of cooling design standards—draws attention to an implicit model of behavior that creates problems for designers of alternative, non-compressor cooling systems. Agbemabiese, Berko, and du Pont offer an analysis of how imported cultural forms and cooling technologies impact comfort and energy use in Ghana and Thailand, pointing to the effective natural cooling provided by traditional clothing and building designs in both societies.

## Marketing Efficiency

Three papers concern the marketing of energy efficiency by utilities. Ignelzi and Brown explore the elements of program design necessary to insure persistence of energy savings by commercial program participants. Keane and Tiedemann consider the effects of advertising on customer awareness, program penetration, and energy savings. Weijo and Boleyn's tests of green marketing programs show product design as well as awareness to be crucial to program success.

## Consumer Choice and Consumer Habits

The final three papers address issues of consumer choice and energy use in different macro-social contexts. Fitzgerald considers the consequences of competing models of consumer rationality for energy efficiency policy. Lorsbach, Narciss, and Boronbaev explore the social, technical, and institutional limits to efficiency in Kyrghyzstan. Emery and Gartland offer a model of activity patterns, technology choice, and energy flows for use in the analysis of utility data. The authors use monitored data from four homes and show, consistent with prior studies, predictable, repeated patterns of behavior reflected in load data. They suggest that pattern analysis techniques could be more widely used to analyze load data.

Taken together, this collection of papers presents a broad range of issues, methods, models, and theories concerning the human dimensions of energy use and energy efficiency. On several subjects the panel includes related synergistic papers that jointly advance understanding of topics such as: cross-cultural differences in energy use, both generally and for air conditioning in particular; the structure of the contracting and construction industry and its interaction with regulation and equipment size specifications; the ways in which energy users interpret energy-use labels and reports; and critical limits to conventional design standards and the implicit conceptualizations of behavior upon which they are based.

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