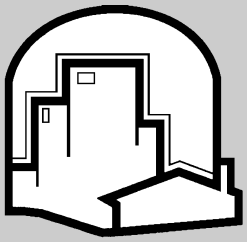

2002 ACEEE Summer Study on Energy Efficiency in Buildings

Teaming for Efficiency
PROCEEDINGS

5

Utility Issues

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Foreword

The 2002 Summer Study on Energy Efficiency in Buildings, a biennial conference organized by the American Council for an Energy Efficient-Economy (ACEEE) brings together professionals from around the world to discuss the technological basis for, and practical implementation of, improving energy use in buildings. Participants, including authors of the papers published in these proceedings, represent government agencies, industry, utilities, national laboratories, universities, consultants, public interest groups, and others.

We selected the Summer Study's theme, "Teaming for Efficiency," to highlight the importance of public/private partnerships, regional collaborations, and inter-regional efforts. However, it is clear from the papers presented at this conference and published in these proceedings that the word "team" meant much more to our conference participants than the traditional definition with which we had started—a group of people joining together to bring a specific effort to fruition. The complexity and global nature of today's energy concerns calls for national and international collaborations and the linking together of fields of study and strategies which often evolve separately.

In addition to focusing on teams and partnerships collaborating on specific projects, papers in these proceedings highlight the importance of metaphorical teaming between many individual subjects. Lessons learned from the papers include:

- teaming between individuals involved in field measurements and analytical evaluations is key to developing new efficient products
- the integration of component technologies into building systems results in totals greater than the sums of the individual parts
- research and deployment efforts need to complement each other
- teaming of systems with operators through commissioning, load management, and the use of information technologies is key to realizing expected energy savings and curtailing demand
- teaming is key to getting the tools that support energy-efficient building design and construction into the hands of people who design, build, and operate buildings
- as witnessed in the subject of utility issues, the lack of teamwork and the absence of the ethic of collaboration for the good of society as a whole derailed one of the world's largest energy infrastructures
- the issue of teaming runs through the whole field of market transformation: defining market transformation is, in itself, a team effort, and market transformation programs inherently rely on team efforts to be successful. Advocates of energy efficiency must team with those working to improve the quality of the built environment because energy efficiency is inherently linked with increased comfort and productivity in buildings

- teamwork between program developers and evaluators ensures that we learn from our mistakes and promote our successes
- cross-cultural efforts lead to more effective programs

Finally, as global events this past year have reminded us, energy efficiency professionals are part of the team working to solve global environmental and security problems.

The subjects of the ten volumes in these proceedings are:

1. Residential Buildings: Technologies, Design, Performance Analysis, and Building Industry Trends
2. Residential Buildings: Program Design and Implementation
3. Commercial Buildings: Technologies, Design, Performance Analysis, and Building Industry Trends
4. Commercial Buildings: Program Design and Implementation
5. Utility Issues
6. Market Transformation
7. Information and Electronic Technologies: Promises and Pitfalls
8. Human and Social Dimensions of Energy Use: Understanding Markets and Demand
9. Energy and Environmental Policy
10. Program Measurement and Evaluation

At this 15th Summer Study, we offered participants a new presentation format—"Round Table" sessions. These sessions involved a full hour and a-half session within the topic area of each panel, and were designed so that industry and non-industry participants could collaborate on topic areas where issues are best addressed by a diverse panel of authors. Within each volume of these proceedings, you may find one or two such "Round Table" papers.

We, the Co-Chairs, would like to thank the 25 Panel Leaders who evaluated more than 600 abstracts, and selected and led 273 papers through a rigorous review process. We would like to thank the many peer reviewers who worked with the Panel Leaders through this process. Most importantly, we would like to thank ACEEE staff, in particular Glee Murray, Rebecca Lunetta, Renee Nida, Deborah Ziff, and Julie Harvell for their tireless efforts to make this an extremely successful conference and to produce these valuable proceedings.

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Acknowledgments

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PANEL 5: INTRODUCTION

Utility Issues

The electric utility industry is currently experiencing a time of substantial uncertainty and market volatility. Against this backdrop of complex and challenging circumstances, this panel covers a wide range of topics related to the general subject of promoting utility sector energy efficiency programs. Electric industry restructuring is of course a key underlying theme, and there are a number of papers devoted to examining how energy efficiency is being addressed in a restructured environment, particularly including the issue of public benefit funds. In addition, there are several papers exploring the use of energy efficiency and demand response strategies to help respond to the reliability problems faced by many utilities during the past few years. Finally, the remaining papers address a variety of other important utility-related subject areas, including new energy efficiency program designs, the role of Energy Service Companies (ESCOs) and performance contracting, and various issues relating to natural gas and energy efficiency. The following summaries briefly describe the focus of the papers in this panel.

Assessing the Effectiveness and Projected Load Impacts of Energy Efficiency Programs Under Different Market Structures, Vine et al. explores the effectiveness of new mechanisms to promote the funding of energy efficiency and load management programs under different types of electricity and/or market reform. Geller et al. analyze the potential costs and benefits of adopting a systems benefit charge (SBC) for all of the states in the Southwest region. Finally, Kushler et al. report on the effectiveness of state energy efficiency programs designed to reduce local or regional reliability problems by increasing the efficiency of energy use during peak load periods.

The Effectiveness of Program Administration Using PGC Funds examines the experiences of three prominent states that are leading examples of the use of public benefit funds for energy efficiency.

Kuntz et al. describe some of the challenges involved in transitioning from utility-run demand-side management (DSM) programs to a state-administered, third party implemented, public benefits program approach in Wisconsin. Friedmann presents a challenging critique describing some of the problems he perceives with the recent experience surrounding the administration of energy efficiency programs in California. Hamilton et al. provide an overview of the encouraging experience thus far with the nation's first "energy efficiency utility" in Vermont. Curtis and Rudman present the results of their initial quantitative evaluation of the impacts of California energy efficiency programs in 2001.

The Evolution of Demand Response Programs During Periods of Market Instability—A Review of Lessons Learned and Future Directions focuses on demand response programs in

the United States. In a "Round Table" presentation, Fryer et al. present a survey of recent program objectives for demand response programs, review the market for demand response, and provide examples of how demand response principles are being applied in innovative ways across the country. This includes a description of a Sacramento Municipal Utility District (SMUD) demand response program, which utilizes Internet-based communications and technologies, and a review of California Energy Commission (CEC)-sponsored case studies, describing how demand response systems were installed in commercial establishments in California.

Administration and Implementation of Public Benefit Programs, a "Round Table" presentation, features representatives from four of the leading states in the nation in terms of the use of public benefit funds to support energy efficiency programs: California, New York, Vermont, and Wisconsin. Each state takes a somewhat different approach to administering and implementing their programs, and their different experiences are quite interesting. The paper by York et al. provides a brief overview of each state's structure and experiences to date, along with some synthesis and summary comments.

The Role of Energy Efficiency Programs in Restructured Markets includes papers that address this issue from three different frames of reference.

Evans and Zeman review the status of electric industry structural reform in several transition economies in Eastern Europe, and discuss the implications of these developments for energy efficiency. Mihlmester and Kathan present a conceptual piece on the subject of how Regional Transmission Organization (RTO) policies might be used to encourage energy efficiency. Pavan presents an interesting description of a very encouraging structure for providing energy efficiency, which Italy is establishing as part of its electric industry "liberalisation."

Evolution of ESCO Markets and Performance Contracting Programs provides cutting edge information on the role of energy service companies and the use of standard performance contracting types of energy efficiency programs.

Osborn et al. present the latest national research data on the U.S. ESCO industry from the NAESCO Database Project, an excellent "big picture" review of the national market in terms of the activities of energy service companies. Schiller et al. present a practical overview of three of the leading state programs for standard performance contracting, reviewing the approaches taken in Colorado, New York, and Wisconsin in terms of such features as their use of measurement and verification (M&V) and their philosophy regarding the incorporation of market transformation objectives. Conchilla et al. provide a description and discussion of an interesting "standard offer" pilot program in Texas, which incorporates many of the practical lessons that have been learned in this industry.

Using Demand Response Programs as a Tool to Ensure System Reliability and Stabilize Wholesale Electricity Prices presents three different perspectives on the need for increased demand responsiveness in the California market. Herter et al. propose to eliminate the "crisis driven" nature of most utility demand response programs by making the installation of demand response systems in residential homes part of each utility's obligation to serve and then offering customers a choice of control strategies or rates depending on their prefer-

ences for voluntary or mandatory load relief. Wilson et al. review the effectiveness of the CEC's attempt to build a new communications and metering infrastructure for medium and large commercial customers without the concomitant rate structures and/or incentive payments to motivate customers to use the systems. Finally, McElroy and Barnes describe some of the key barriers and opportunities for increased customer participation in a demand response program based on the results of focus groups conducted in California during the reliability crises of 2000-2001.

Customer Experience with Demand Response Programs During the Perfect Storm(s) of 2001 in California and New York Electricity Markets focuses on customer response and/or reduction in load, stimulated by different types of programs, which enables technologies and price signals/program incentives. Kathan and Mihlmester focus on the role that customers may be able to play in meeting future capacity and reserve needs in wholesale electricity markets with installed capacity requirement (ICAP) or other market structures. Goldman et al. explore the relative importance of demand response (DR) program design features, sophistication of energy management system (EMS) control strategies, and reliance on enabling strategies to predict the level of customer load response (in kW) achieved by programs in California and New York. Finally, Douglas et al. describe the design and performance of New York's Price Responsive Load program operated during the summer of 2001 by the New York Independent System Operator.

New Program Designs to Yield Sustainable Energy Savings includes an assessment of the effectiveness of three different types of program strategies designed to obtain sustainable energy savings. Erickson and Bloch describe Wisconsin's attempt to require that all program administrators use a theory-based approach to design, evaluate, and improve energy efficiency programs implemented by third parties in their state. Stout et al. describe and evaluate the effectiveness of three key programs designed to provide lasting improvements to local communities and increase public support for continued funding. Wirtshafter et al. review the experience of standard performance contract programs in attracting market firms that have traditionally provided energy and consulting services to large customers. The authors conclude that a new approach is needed to harness the trend towards outsourcing energy services.

Three Aspects of Energy Efficiency Involving Natural Gas explores the connection between energy efficiency and natural gas in three very different contexts.

Bicker and Wisniewski describe some of the barriers to a natural gas utility embracing energy efficiency and present a recommended regulatory solution to those barriers that have been proposed by a natural gas utility in the Northwest. Patibandia et al. describe electric system efficiency initiatives by NYSERDA involving distributed generation and combined heat and power (CHP) programs and their experiences to date. Bolinger et al. present a very interesting treatise on how energy efficiency and renewable energy provide additional benefits to an electric system in terms of mitigating natural gas fuel price risk, and how those benefits might be quantified and recognized in resource planning decisions.

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