Foreword

Welcome to the 1998 ACEEE Summer Study on Energy Efficiency in Buildings, the tenth in a series of biennial workshops devoted to technology, policy, and implementation issues related to energy use in buildings. This week-long conference brings together a diverse group of professionals from around the world representing the views and expertise of utilities, industry, national laboratories, government agencies, public interest groups, and universities.

The theme of this Summer Study is ***Energy Efficiency in a Competitive Environment***, reflecting one of the major trends in the field of energy efficiency—the growing need to strategically position energy-efficient and renewable energy technologies in ways that harness market forces. Restructuring of the electric utility industry and increased retail competition in both electric and gas markets has made it imperative to prove to consumers that energy efficiency improvements in buildings can constitute profitable investments. The need to compete in both domestic and international markets is forcing corporations and nations to focus on energy efficiency as a means of improving productivity and reducing costs. Across the globe, efforts to capture the benefits of energy efficiency are increasingly market-driven and market-based.

Other drivers for energy efficiency are also emerging. Of particular note are the environmental benefits of energy efficiency. Numerous studies have documented that energy efficiency is a highly cost-effective and politically palatable near-term solution for addressing global warming. In many countries, including the U.S., buildings are heated, cooled, lit, and powered primarily by fossil-generated electricity, making the buildings sector an important target for reducing greenhouse gas emissions through improved energy efficiency.

But there are also new and continuing challenges. The first decade of the next century promises to extend the current era of low energy prices. At the same time there is no perceived threat of near-term electricity shortages or oil supply disruption. With much of the public still unaware of how energy efficiency contributes to the environment, it is not surprising to find relatively little interest by citizens, corporations, and the government in saving energy for its own sake.

The downward slide of utility demand-side management investments that was so apparent at the 1996 Summer Study is continuing; however, in a few key states such as California and New York the decline is being offset by market transformation programs funded through public benefits charges. In response to such opportunities presented by electric utility industry restructuring, portions of the industry and its efficiency services subsidiaries are staffing up and forming strategic alliances to offer not only performance contracting, but also commodity sales, maintenance, power quality, load profiling, billing, metering, and other services to its customers.

Set against the backdrop of these trends, noteworthy technology developments and implementation progress have been made since the 1996 ACEEE Summer Study. A growing body of research expertise has been translated into innovative and advanced technologies that are now cutting energy costs in both residential and commercial markets. Examples include gas-driven heat pumps, duct diagnostics and sealing, and low-emissivity windows. The past several years have also heralded the rapidly growing use of information technologies in building construction, energy metering, energy management and control systems, and telecommunications. Another technical development is the expanded scope of energy efficiency activities to include building start-up and operations and maintenance, in addition to installing energy conservation measures. The result has been an improved ability to deliver long-term savings.

These market successes reflect the great progress being made in integrating industry and government research agendas, the growing role of energy service companies, the mainstreaming of performance contracting, and the maturation of market transformation efforts. They have also benefited from better alignment between energy efficiency and diverse goals such as indoor air quality and health; occupant comfort, amenities, and productivity; and peak demand reduction. In addition, recent successes

have capitalized on the growing understanding of how individuals and organizations make decisions that affect energy use (such as choice of building and lighting designs and the purchase of heating and cooling equipment) and the expanding field of knowledge of how energy is used in society.

All of these issues, trends, challenges, and accomplishments are discussed in the ten panels that comprise the 1998 Summer Study. Each panel deals with a particular cluster of issues and presents its papers in a separate volume of the proceedings. The ten volumes are as follows:

Volume 1 — Residential Buildings: Technologies, Design, and Performance Analysis

Volume 2 — Residential Buildings: Program Design, Implementation, and Evaluation

Volume 3 — Commercial Buildings: Technologies, Design, and Performance Analysis

Volume 4 — Commercial Buildings: Program Design, Implementation, and Evaluation

Volume 5 — International Collaborations and Global Market Issues

Volume 6 — Deregulation of the Utility Industry and Role of Energy Services Companies (ESCOs)

Volume 7 — Market Transformation

Volume 8 — Information Technologies, Consumer Behavior, and Non-Energy Benefits

Volume 9 — Sustainable Development, Climate Change, Energy Planning, and Policy

Volume 10 — Building Industry Trends

The 1998 Summer Study repeats the panel devoted to building industry trends, which was introduced in 1996. Several new topics have been introduced this year, including sustainable development, information technologies, non-energy benefits, and global market issues.

In closing, we would like to thank the 22 panel leaders who worked their way through more than 600 abstracts, shepherded nearly 300 papers through the peer-review process, and selected 30 displays. The ACEEE staff also deserve special recognition, in particular Glee Murray and Rebecca Lunetta, for their coordination of a complex of logistical details that must come together to make the conference a success.

Enjoy the conference.

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Acknowledgments

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PANEL 6 INTRODUCTION

Deregulation of the Utility Industry and the Role of Energy Services Companies (ESCOs)

This panel covers a wide spectrum of topics and opinions. The focus is on electric industry restructuring and how it impacts utility-sponsored demand side management (DSM) and research and development (R&D) programs; how energy services companies (ESCOs) deliver energy efficiency; and how various states and countries are responding to restructuring. The role of ESCOs, performance contracting, new products and services, energy centers, state-funded R&D, aggregating small customers, and restructuring DSM are all addressed.

What Exactly Does an ESCO Do? addresses a theme with an elusive definition. The electric utility industry and its efficiency services subsidiaries are rapidly staffing up and forming strategic alliances to offer not only performance contracting, but also commodity sales, maintenance, power quality, load profiling, billing, metering, and other services to its customers.

In Session 1, Rosenstock and Barrett profile the extent of intermarriage between electric utilities and performance contractors and other "ESCOs" during the past three years and track the nature, extent, and market segments purchasing efficiency services nationwide. Fraser and Montross more narrowly profile the performance contracting industry, distinguishing among full-service, consulting, and product manufacturing firms in the business. Alexander et al. analyze various approaches to serving small customers with energy and energy efficiency services, examining whether it is economically and technically feasible to supply such customers.

The Evolution of Performance Contracting in the Marketplace documents what is happening and hypothesizes what will happen in California and elsewhere during 1998 and beyond.

Dayton et al. trace the recent changes in the performance contracting industry and predict that efficiency services will gain a larger niche—and be embedded in different organizational and marketing relationships—but performance contracting may not so thrive. Rubinstein et al. follow the early implementation of the standard performance contract in California, asking and trying to answer the question of whether it is a mechanism for both energy efficiency and market transformation in the residential and commercial sectors. Goldberg et al. posit that volatile and declining prices accompanying deregulation argue against efficiency investments but that performance contracting is one strategy end-users can undertake to minimize their risks. A key to making performance contracting affordable is development of monitoring and verification systems that are both credible and cost-effective.

Organizing Energy Efficiency Overseas—I and II examines changing energy efficiency services in many countries as the electric industry restructures. For utilities, energy efficiency services can represent a value-added service that may be attractive to customers, or it may be perceived as a distraction from the core utility business of distributing energy. For energy providers and energy services companies, energy efficiency services may represent a profitable line of business.

Slingerland examines the relationship between electricity sector structure and energy conservation developments in the Netherlands, Denmark, Germany, and the United Kingdom. Redding discusses the emergence of new approaches to the provision

of energy efficiency services in Australia in the context of the (Australian) National Greenhouse Response Strategy, including energy performance contracts and energy facility management. Nilsson describes early experiences in Sweden where competition by electric suppliers demonstrates that a market exists for value-added services such as energy efficiency and green electricity. Clinton and Kozloff look at power sector reforms in six countries and describe lessons on what types of reforms or policies have worked to promote energy efficiency and which have not. Neto describes the growing importance of natural gas markets in Brazil and describes the introduction of competition in the state of São Paulo, Brazil.

Organizing Energy Efficiency in California focuses on California, which in 1997 became the first state to establish a state-level public goods charge to fund such public interest programs as energy efficiency, renewable energy development, R&D, and low-income consumers programs. A state-funded and state-run energy efficiency program is replacing 20 years of utility management of energy efficiency. How should energy efficiency and market transformation programs be administered? How should administrators be selected? Who should design programs? What programs are best suited to transform markets?

Miller describes various administrative approaches under consideration in various states, with particular attention to California. Prahl et al. recount the process used in California to resolve institutional issues in creating a new energy efficiency policy framework, including determining the number of administrators, allocating responsibilities among administrators, deciding how to separate design and implementation functions, and settling who performs financing functions such as authorizing disbursements and managing bank accounts. Goldman et al. describe the successes and challenges of California's non-residential standard performance contract program, focusing on the attempt to adapt the program to the California Public Utilities Commission's market transformation and privatization objectives for energy efficiency.

Other Parties at the Table in a Deregulated Market will become more important as restructuring changes the face of the electric utility industry. New players and approaches and new services and products will appear—some will succeed and others will not.

Golove et al. analyze consumer demand for energy efficiency and green pricing, among other services, as revealed through an analysis of Requests for Proposals (RFPs) by firms and agencies seeking to purchase energy and related services on the open market. Warwick examines historic utility planning and operational practices that impede increased reliance on renewable power, and describes technology needs and the critical role the building sector needs to play in laying a foundation for a sustainable energy future. Pye and Nadel analyze the past contributions of state-level R&D programs and describe their future prospects as funding for state-level R&D moves from utility funding to other sources, such as system benefits charges. Hanson and York discuss the many roles state energy centers may be called upon to fill during the early years of deregulation, including R&D and customer education.

Retail Access, Local Governments, and Small Customers examines small customers who are the potentially overlooked market segment in a deregulated environment. They are divided into unique subdivisions, with each deserving special analysis and treatment.

Prindle and Wiser argue that co-branding to establish a stronger identity for energy efficiency may improve its prospects, as the ENERGY STAR® and Green-E labels are already demonstrating. Titus and Fox analyze a Massachusetts utility retail access pilot program, concluding that residential customers are benefited especially by the educational process afforded them in this environment. Tseng reveals that local governments wear three hats, as franchisers, energy suppliers, and consumers, leading to conflicts among a multitude of public policy objectives.

Other Issues focuses on end-user needs and concerns.

Warfel presents an analysis of recent industry adoption of energy efficiency measures and concludes that differing hurdle rates distinguish measures affecting the manufacturing process from those which do not. Kennedy and Simpson, a performance contractor and a university energy manager, respectively, argue the importance of public benefits charges and for carefully bal-

ancing environmental, efficiency, and commodity cost concerns in procurement activities. McGaraghan and Kromer propose using industry-consensus measurement and verification protocols as a testing grounds for an industry-wide effort to raise understanding of information efficiency issues.

Weijo et al. discuss specific load profiling strategies that may be successful in providing aggregators and end-users with cost-effective, useful information.

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