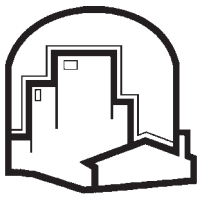
2000 ACEEE SUMMER STUDY ON ENERGY EFFICIENCY IN BUILDINGS



Efficiency & Sustainability

PROCEEDINGS

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

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Foreword

Responding to the theme of this Millennium Summer Study—"Efficiency and Sustainability"—professionals from around the world discussed the technological basis for and practical methods of implementing efficient and (hopefully) sustainable energy use in buildings. Issues, trends, challenges, and accomplishments were discussed. Each volume in this proceedings focuses on specific issues that encompass global visions for the future and discussion of future trends.

The 2000 Summer Study continued to emphasize new trends in buildings, equipment, markets, and social issues. Topics ranged broadly from the ENERGY STAR® program for new construction to building envelope and system engineering issues. The papers presented reviewed the latest information on utility restructuring and impacts on utility-sponsored programs, as well as global market issues, information technologies, and non-energy benefits. Sustainable development strategies; community-scale initiatives; factors influencing energy consumption and purchase of energy-efficient technologies; and how to design, implement, and evaluate energy programs were just a few of the cutting edge discussions that warm the mind and stir our quest for enlightment.

The subjects of the ten volumes in this proceedings are:

1. Residential Buildings: Technologies, Design, and Performance Analysis
2. Residential Buildings: Program Design, Implementation, and Evaluation
3. Commercial Buildings: Technologies, Design, and Performance Analysis
4. Commercial Buildings: Program Design, Implementation, and Evaluation
5. Deregulation of the Utility Industry and Role of Energy Service Companies (ESCOs)
6. Market Transformation
7. Information and Electronic Technologies
8. Consumer Behavior and Non-Energy Effects
9. Energy and Environmental Policy
10. Building Industry Trends

We, the co-chairs, would like to thank the 23 panel leaders who sorted more than 658 abstracts, selecting and nurturing 309 papers through the rigid review and publishing process, and selecting more than 60 talks for the poster sessions. We would also like to thank the many peer reviewers who worked with the panel leaders. Finally, a well-deserved thank you to the staff of ACEEE, in particular Glee Murray and Rebecca Lunetta (who received key assistance from Renee Nida and Julia Harvell) for their support and guidance throughout this process and for making the week a very successful "energy camp."

James McMahon, Lawrence Berkeley National Laboratory
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Acknowledgments

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Panel 5: Introduction

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

This panel addresses the ways in which deregulation of the electric and gas industries has affected energy services companies and the provision of efficiency and renewable energy services in this country and abroad. As the United States, South America, Japan, and Europe accumulate more experience with deregulating electric utilities in particular, we can see the extent to which mandated efficiency efforts are required to stimulate efficiency investments. We are also seeing new efficiency-related products and services emerging in the marketplace. And for reasons of public policy pioneering, geographic proximity, and a tradition of exceptional regulatory scrutiny, California gains special attention in this cutting edge arena.

ESCOs, Theory and Practice presents a variety of perspectives on the promises and reality of energy services delivery, with emphasis on energy performance contracting (the delivery of efficiency services by contractors whose payment is tied to the demonstration and verification of the savings over a period of months and years). Also emphasized is the early experience of green power marketers in California, and some eastern states where partial deregulation has been in place for two years or more.

In Session 1, Goldman et al. draw upon a database of 800 performance contracts nationwide over the past several years to summarize where ESCOs are doing their business geographically and in what end-use markets, the amount of money spent, and the resulting dollar and utilities savings. Wellinghoff and his co-authors describe a pilot program sponsored by the U.S. Environmental Protection Agency and the U.S. Department of Energy to facilitate efficiency investments in the difficult-to-serve small business sector.

In Session 2, Golove et al. interview non-residential electricity customers to determine their preferences in a deregulated environment where both supply and demand services can be bundled. Efficiency, green power, distributed generation, and information and communications services are queried. Reed and Houston narrate the early track record of green power, including the steps states have taken to facilitate its penetration in the marketplace. Wiser, Bolinger, and Holt investigate both product offerings and customer responses to green power marketing.

Public Benefits Programs includes an array of interesting and occasionally unique approaches for public benefits programs, covering the spectrum from traditional low-income programs to standard performance contracting. Program designs and participants have changed since funding has shifted from utility rates to public benefit charges, and the papers included here explore some of the implications from those changes.

Session 3 focuses on low-income energy programs. Belliveau, Sachs, and Plunkett describe the creation of a unique consumer energy cooperative as a way to help low-income energy consumers gain some benefit from retail competition. Tannenbaum, Smith, and Pigg provide lessons from six low-income pilots in Wisconsin and conclude that the public benefit process can increase the politicization of program design and implementation. Issues around client data confidentiality, service coordination, and data sharing are once again in the forefront of discussions as the role of the utility changes and the utility ability to recover costs for services is affected by restructuring. Yaker, Goldner, and Thompson describe a novel approach to rural electric cooperatives—create one in the ultimate urban environment, New York City. This new "cooperation among cooperatives" has given residential and small commercial customers a voice in the debate over restructuring.

In Session 4, Kushler presents a review and initial assessment of public benefits policies and programs in states that have restructured their electric utility industry. Jensen focuses on activities in the Midwest, comparing and contrasting the energy efficiency programs in Illinois, Ohio, and Wisconsin. Schiller, Goldman, and Henderson focus more narrowly on the standard performance contracting programs funded by public benefits charges in California, New Jersey, Texas, Colorado, Connecticut, Wisconsin, and New York. They discuss varying objectives of these programs along with recommendations on key design issues, measurement and verification, and the ability of these types of programs to transform markets.

Session 5 focuses on the California program experience. Goldstone, Rufo, and Wilson evaluate the California standard performance contracting program based on a theory-based approach to market transformation. Initial evaluation results of the program challenged the assumptions underlying the original program theory, and this paper develops important practical lessons on using a theory-based approach to improve program design. O'Drain et al. focus on the role of ESCOs in the commercial/industrial HVAC and motors markets, and explores ESCOs' awareness of market transformation initiatives as well as specific tactics, directions, and strategies that ESCOs are using to compete in these markets. Dickerson and her co-authors examine both residential and non-residential standard performance contracting programs from the perspective of detailed interviews with both participants and non-participants. Preferences on program design, forms, eligible measures, incentive levels, and measurement and verification are analyzed, along with participation decision drivers, culminating in recommendations for future programs.

Real Time Metering looks at price signals and other market mechanisms that are transforming the demand side of the electric supply and demand equation. In Session 6, Miller and Swaminathan compare the emergency load response programs of two independent system operators (ISOs)—in California and New England—and provide suggestions for increasing the attractiveness and effectiveness of the programs. Both programs offer payments to retail customers when they voluntarily cut their load during high demand periods. Kirby and Kueck take a buildings perspective in discussing opportunities to reduce building energy costs by responding to real-time energy prices. They discuss physical capabilities, decision processes, price disclosure, communications, aggregation, monitoring, and performance certification. Dunlop and Gilligan examine the potential for energy services companies to participate in wholesale demand reduction markets, focusing on the need to accommodate new demand-side activities that are much smaller scale than conventional generators and ISOs are used to seeing. They cover both conceptual approaches and practical experience to date in California and elsewhere.

New Entrants in the Marketplace looks at new ways of doing business. In Session 7, El-Sharif and Horowitz focus on using financial valuation to increase market penetration of energy-efficient products and services, using ground-source heat pump systems as a case study. Mihlmester and McKelvey look at e-business and the energy efficiency/energy services arena. They provide an overview of current energy and efficiency e-business concepts, offer insights into the key steps involved in developing an e-business, and demonstrate how e-business can transform the energy efficiency marketplace.

The Status of Efficiency Abroad examines the relatively disappointing recent experiences of efficiency programs in Europe, Central and South America, and Japan. While it is clear that some nations have done better than others and that public and utility-sponsored efficiency programs are gaining ground in certain places, the prognosis for the efficiency industry in deregulated marketplaces is not good. Of course it has not been outstanding in countries outside of the United States with strong regulatory powers either.

In Session 8, Maldonado and Friedmann contrast the experiences in Brazil, Chile, and Mexico, focusing on whether public or private power systems makes a difference on the degree of efficiency incentives and facilitation. Jannuzzi discusses the energy efficiency situation in Brazil.

In Session 9, Evans reviews the experience of ESCOs in the Czech Republic, Ukraine and Russia, with attention on the factors driving their diversity in foci, efforts, and outcomes. Thomas et al. examine the European Union countries' experiences with mandated efficiency programs, proposing policy actions to improve demand-side programs' effectiveness and impacts. Lopes and his co-authors also look at Europe, focusing on how integrated resource planning (IRP) and DSM are faring in each of the European Union countries. They describe the relationships between electricity market structures and characteristics on the one hand, and the level of IRP and DSM activities on the other.

Session 10 examines the experiences of single countries. Bergmasth et al. narrate the evolution of efficiency programs and organizations four years after deregulation has been implemented in Sweden's electric industry. They do so from the customers' vantage point. Pesic and Ürge-Vorsatz examine Hungary's experience with utility restructuring, especially its impact on efficiency efforts. Murakoshi, Nakagami, and Sumizawa describe a project piloted by Japan's Ministry of International Trade and Industry providing audits and retrofits of commercial buildings.

In poster sessions, Sherman and Snell discuss the advantages of selling energy efficiency to customers as power marketers have done with green power: lower pollution, job creation, system reliability, and lower cost are among the potential marketing points that can be effective. Matsson and Pyrko discuss different types of energy services offered in deregulated electricity markets in Sweden, suggesting and evaluating the types of criteria customers can use in selecting energy services so energy use efficiency and demand reduction are part of the services provided. In a clever campaign to package, price, and promote a local wind power project, Reed, Bengtson, and Renner describe the utility of Morehead, Minnesota's "Capture the Wind" program, which fully subscribed its premium-priced green power project with "Charter Member" customers in less than two month by combining block pricing with effective publicity. Rhee, Lee, and Park describe the electric restructuring situation in Korea, which should be an attractive market for ESCOs due to its high energy growth rate and increasing dependence on energy

imports. They discuss the changes needed in Korea to enhance the ability of ESCOs to be key players in the energy conservation market. Farinaccio and her co-authors describe Wisconsin's Pilot Energy Efficiency Program, praising innovative financial incentives and lamenting the limitations posed by a largely rural demonstration area for the program.

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