COM-200

Before the Hawaii Public Utilities Commission

Exhibit of
Jim Lazar, Consulting Economist

On Behalf of
County of Maui

Experience and Qualifications of Jim Lazar

Docket No. 03-0371

July, 2004

Jim Lazar is a consulting economist specializing in utility rate and resource analysis. In more than seventy appearances before regulatory bodies in the United States and abroad, he has provided expert assistance in the areas of revenue requirement, cost of capital, formation of new publicly owned utility systems, electric and gas utility integrated resource planning, cost of service and rate design, least cost and integrated resource planning, the appropriate regulatory treatment of excess capacity, subsidiary profits, and regulatory treatment of real estate transactions.

Technical Assistance: Jim Lazar has provided technical assistance to local, state, and federal public agencies, public interest groups, industry trade groups, and electric utilities. Expert testimony has been presented before the state regulatory commissions of Washington, Idaho, Montana, Hawaii, Illinois, Oregon, and Arizona, before the Federal Energy Regulatory Commission, Nuclear Regulatory Commission, Economic Regulatory Administration, Bonneville Power Administration, California Energy Commission, British Columbia Utilities Commission, and numerous local regulatory agencies. Internationally, Mr. Lazar has assisted clients in New Zealand, Ireland, Mozambique, Namibia, and Canada with utility rate and resource analysis.

Training: Jim Lazar has taught Energy Economics as a member of the faculty of Edmonds Community College, and previously served as a faculty member to the Western Consumer Utility Training Center in 1982. He was the lead author of a book on utility rate and resource issues, The People's Power Guide, published in 1982, and a handbook on electric utility cost of service analysis prepared for the Arizona Corporation Commission in 1993. He has presented papers at numerous conferences in the United States, as well as Canada, New Zealand, and Austria, and has taught courses utility resource and regulatory principles in The Philippines, India, China, Indonesia, Brazil, and for the regulatory Commission of Kyrgyzstan.

EDUCATION:

University of California, Los Angeles		
Shimer College, Mt. Carroll, Illinois		
Western Washington University, Bellingham B.A. 1974		(Economics)
Graduate work:	Western Washington University	(Economics)
	University of Washington	(Public Administration)

EMPLOYMENT HISTORY

1979 to Present

Self-employed consulting economist, and community college faculty: Transportation studies; Utility rate and resource analysis, conservation program design and evaluation, transportation system analysis. Associate with the Regulatory Assistance Project since 1999.

1983-84

Research Director, Northwest Energy Coalition: Directed studies on energy resource cost-effectiveness, including nuclear, conservation, building codes, and unconventional resources;

1982

Research Associate, Metropolitan Development Council of Tacoma, Washington: Research Director, People's Organization for Washington Energy Resources

PUBLICATIONS AND RESEARCH [Excluding Regulatory Proceeding Testimony]

Hawaii Energy Utility Regulation And Taxation, prepared for Hawaii Energy Policy Project in conjunction with J. Carl Freedman, 2003

Power Market Restructuring Issues: Integrated Monopoly → Single Buyer → Wholesale Market, prepared for the Electricity Control Board of Namibia in conjunction with Nexant Corporation / U.S. Agency for International Development, 2003

History, Current Status, and Future of the Residential Exchange, Snohomish Public Utility District, 2003

Tools Available to BPA and WAPA to Develop Renewables, Western States Renewable Energy Summit, Reno, Nevada, 2003

The Role of Regulation, and Starting and Staffing a Regulatory Commission, prepared for the Central Electricity Commission of Mozambique in conjunction with Nexant Corporation / U.S. Agency for International Development, 2003

Low-Income and Rural Electrification Assistance Programs for the Indonesia Social Electricity Development Fund, Prepared for the Institute of International Education / U.S. Agency for International Development, 2002

Convergence: Electricity and Natural Gas in Washington State, Prepared for Washington State Office of Trade and Economic Development, 2001 (One of seven authors)

Improving State Electricity Taxation, Prepared for Regulatory Assistance Project, 2001 (with Cheryl Harrington)

Lessons Learned from the California Energy Crisis: Prepared for Regulatory Assistance Project / Energy Foundation China Sustainable Energy Program, 2001

Consumer Protection and Customer Service in Emerging Utility Industry Structures: Prepared for Regulatory Assistance Project (Brazil) / USAID, 2000

Electric Cost of Service Analysis: Prepared for City of Burbank, California Public Service Department, 2000

Tariff Analysis in a Regulatory Regime: Prepared for Administrative Staff College of India / USAID, 1999

Energy Efficiency Promotion Policies: Prepared for Administrative Staff College of India / USAID, 1999

Demand Side Management in a Regulatory Environment: Prepared for Institute of Financial Management and Research (Madras, India) / USAID, 1999

Consumer Advocacy in a Restructured Electric Utility Industry: Prepared for Administrative Staff College of India / USAID, 1999

Private Energy Utilities and Bellevue's Options for the Future: Prepared for City of Bellevue, Washington, 1998

Energy Sector Regulation Principles and Practice: Prepared for Philippines Department of Energy / USAID, 1997

Electric Rate Unbundling for a Competitive Market: Prepared for Washington Water Power Company / Idaho PUC, 1997

Retail Wheeling Pilot Proposal, Puget Sound Power and Light Company, Office of the Attorney General, State of Washington 1996

Conservco: An Option for Achieving Efficiency in a Competitive Utility Market Structure, Prepared for the Snohomish County Public Utility District, 1995

Making Integrated Resource Planning Better and Cheaper, British Columbia Energy Coalition, 1995

Cost Elements and Study Organization For Embedded Cost of Service Analysis, Briefing Paper to Arizona Corporation Commission, (Arizona Corporation Commission, July, 1992)

Transmission and Distribution Cost Allocation in Embedded Cost of Service Analysis, Briefing Paper to Arizona Corporation Commission, (Arizona Corporation Commission, July, 1992)

Production Cost Allocation in Embedded Cost of Service Analysis, Briefing Paper to Arizona Corporation Commission, (Arizona Corporation Commission, July, 1992)

Utility Connection Charges and Credits: Stepping Up the Rate of Energy Efficiency Implementation, (Second International Conference on Energy Consulting, Graz, Austria, 1991)

Electric Power Resource Evaluation for Improved Fish Migration, (Pacific States Marine Fisheries Commission, 1991)

Long-Term Financial Model Review: Prepared for Emerald People's Utility District, 1991

Unrecovered Costs of Serving New Residential Space Heat Loads, (Mason PUD #3, June, 1990)

Direct Use of Natural Gas for Residential Space and Water Heat Compared to Gas-Fired Electric Generation for Hydro-firming: Thermodynamic, Economic, and Environmental Impacts, (Association of Northwest Gas Utilities, 1990)

Model Energy Conservation and Power Planning Action Plan, (Northwest Conservation Act Coalition, 1990)

Ten Year Financial Plan Analysis for Startup, Oregon Trail Electric Cooperative, 1988

Impact of Operation of the Columbia Basin Irrigation Project on Northwest Electric Power Users, 1954-1986; (Natural Resources Defense Council, 1987)

WPPSS Preservation Costs and the BPA Residential and Small Farm Exchange (Mason County PUD, 1986)

WPPSS Nuclear Plants #1 and #3 in a Rapidly Changing Environment, (Snohomish County PUD, 1986)

WPPSS #1 and #3: Costs and Alternatives, (Northwest Conservation Act Coalition, 1984)

Do or Die: The Seabrook Nuclear Generating Station and the Public Service Company of New Hampshire, (Campaign for Ratepayer Rights, 1984)

Should Utility Conservation Efforts Continue During a Surplus, (Pacific Northwest Regional Economic Conference, 1984)

WPPSS Nuclear Plant #3: Where Now?, (Northwest Conservation Act Coalition, 1983)

A Ratepayer Perspective on Avoided Cost Pricing Under PURPA Section 210, (California Energy Commission, 1982)

The People's Power Guide: A Manual of Electric Utility Policies for Consumer Activists, (People's Organization for Washington Energy Resources, 1982)

Model Conservation and Electric Power Plan for the Pacific Northwest, (Northwest Conservation Act Coalition, 1982)

Electricity Market Decontrol through Windfall Profits Taxation and Competitive Power Supply Contracting, (PNW Regional Economic Conference, 1982)

Northwest Electric Load Shaping for Fish Enhancement, (Romer Associates/National Marine Fisheries Service, 1981)

Conserving Electricity in the Pacific Northwest, (Pacific Northwest Regional Economic Conference, 1980)

JIM LAZAR   CONSULTING ECONOMIST
RECENT CONSULTING CLIENTS [PARTIAL LISTING]

UTILITIES AND UTILITY ASSOCIATIONS

City of Burbank, California
Emerald People's Utility District [Eugene, OR]
Hawaiian Electric Company
Mason County Public Utility District #3 [Shelton, WA]
Salem Electric Cooperative [Salem, OR]
Snohomish County Public Utility District [Everett, WA]
Northwest Gas Association [Portland, OR]

PUBLIC AGENCIES

Arizona Corporation Commission
City of Bellevue, Washington
Environmental Protection Agency
Hawaii Department of Commerce and Consumer Affairs
Idaho Public Utilities Commission
Mount Rainier National Park
National Marine Fisheries Service
Office of the Attorney General, Washington
Pacific States Marine Fisheries Commission
Research Corporation of the University of Hawaii
Washington State Department of Community, Trade, and Economic Development
Washington State Department of Wildlife
Washington Utilities and Transportation Commission

NONPROFIT ENTITIES

Association for the Advancement of Sustainable Energy Policy (Canada)
British Columbia Energy Coalition (Canada)
Citizen's Utility Board, (Illinois)
Columbia River Intertribal Fish Commission
EnergyWatch (New Zealand)
Institute of International Education
Montana Electricity Buying Cooperative
Natural Resources Defense Council
Nez Perce Indian Nation
Northwest Conservation Act Coalition
Regulatory Assistance Project
Squamish Indian Nation (Canada)
Time to Respect Earth's Ecosystems (Canada)
Yakima Indian Nation

EXPERT TESTIMONY AND ENERGY/UTILITY RESEARCH BY JIM LAZAR

YEAR	ORG	FORUM	CASE #	TOPIC/TITLE
1979	SKAG	NRC		Alternatives to Skagit Nuclear Plant
1979	PGN	OPUC	UF-3518	Review Increase Rate of Return
1979	PSD	WUTC	U-79-70	Insulation Stds, Conservation Loan Prog Industry
1979	PSD	NRC		Relocation of Skagit Plant
1979		WPPSS		Critique of WPPSS Bond Statements
1979		SENATE		"Summary Data on Petrol Supply Demand & Price"
1980	PSD	WUTC	U-80-10	Resource Alternatives, Error in Water Study Rate Study
1980	PSD	WUTC	U-78-05	Rate Analysis and Service Fees
1980	IPC	IPUC		Conservation Based Hook-up Charges
1981		GRAY		Review of PURPA Rate Making Standards
1981		SCL		"Giving Your Customers What They Want--And Need"
1981	WPPSS			Senate Report: Total Costs WNP's 1 Through 5
1981	WWP	IPUC	U-1008-155	Review WNP & Skagit as Relates to WWP
1982	CEC	CEC	OII-2	Recommendations and Conclusion on PURPA
1982	CEC	CEC	OII-2	Ratepayer View on Avoided Cost (PURPA)
1982	WWP	WUTC	U-82-10	Review WWP Costs Study
1982	BPA	BPA		Low Density Discounts
1983	MTP	MPSC	83.9.67	Cost Effectiveness of Colstrip 3 to Ratepayer
1983	PPW	WUTC	U-83-57	Colstrip & PP&L Review Blk Hills Colstrip Cost Exhibit
1983	PSD	WUTC	U-83-54	Review Rate Design
1983	WPPSS		394	Draft Cost Effectiveness Study of WNP 2&3
1983	WPPSS			WNP3 Cost of Completion & Operation to NCAC
1983	WPPSS			"WNP 3, Where Now?"
1983	WWP	WUTC	U-83-26	Cost of Colstrip 4, WWP Rate of Return, AFUDC, Power Supply Costs
1983	WWP	IPUC	U-1008-204	WNP3 Cost
1983	WWP	IPUC	U-1008-185	Review Colstrip 3&4 Costs, Rate of Return on WNP 3, Power Supply Costs
1984	PSD	WUTC	U-84-27/44	CWIP
1984	PSD	WUTC	U-84-61	Review Secondary Power Purchases & Sales
1984	WPPSS	NCAC		WNP 1&3 Cost Alternatives
1984	WWP	WUTC	U-84-28	Power Supply Costs, Lobbying Costs, Kettle Falls Rates
1985	PGN	OPUC	UE-44	Rate Design For Residential Users
1985	WWP	IPUC	U-1008-204	WNP3 Cost Rebuttal
1985	WWP	WUTC	U-85-36	Cost of Service Analysis, Rebuttal to Schoenbeck
1986	AZP	ACC	U134585156	Cost of Service, Rate Design, Load/Resource Balance
1986	CGC	WUTC	U-86-100	Revenue Requirements, Cost of Service
1986	PGN	OPUC	UE-48	WPPSS Investments, Property Transfers
1986	PPW	WUTC	U-86-02	Skagit, Pebble Springs, Cost of Service, Rate Design
1986	PSD	WUTC	U-85-53	Conservation Program Cost of Service/Rate Design
1986	SNO	SNOPUD		WNP 1 & 3 In A Rapidly changing environment"
1986	WECO	WUTC	U-86-117	Cost of Service, Rate Design
1986	WPPSS			Power Cost of WNP 2
1986	WWP	IPUC	U-1008-204	Surrebuttal
1987	AZP	ACC	U-1345-85367	Review AZP Cost of Service & Rate Design
1987	PSD	WUTC	U-86-131	BPA Settlement Exchange Agreement
1987	PSD	WUTC	U-87-1262	ECAC
1987	NIGAS	ICC	87-0032	Cost of Service
1987	SALEM	SALEM		Cost of Service/Rate Design
1987	WDW	9TH	86-7704	Cost Effectiveness of Third AC Intertie
1988	PP&L	WUTC	U-87-1513	Residential Rate Design
1988	CWE	ICC	87-0427	Cost of Service/Rate Design
1988	WWP	WUTC	87-1532-T	Gas Transportation Rates
1988	WWP	WUTC	88-2380-T	Natural Gas General Rate Increase
1988	IP	ICC	87-0695	Cost of Service/Rate Design
1988	SALEM	SALEM		Large Industrial Rate Study
1988	WWP	WUTC	88-2363-P	Power Cost Adjustment
1988	PUGET	WUTC	88-2010-T	Energy Cost Adjustment
1989	MASON	MASON		Service Extension Policy Analysis
1989	PUGET	WUTC	81-41-RE	Energy Cost Adjustment Reopening
1989	PUGET	WUTC	89-2862-T	Energy Cost Adjustment
1989	PUGET	WUTC	89-2688-T	General Rate Increase - WPPSS #3 - Cost of Service/Rate Design
1989	WWP	WUTC	U-89-3105-T	Interstate Cost Allocation/Excess Capacity

EXPERT TESTIMONY AND ENERGY/UTILITY RESEARCH BY JIM LAZAR

YEAR	ORG	FORUM	CASE #	TOPIC/TITLE
1990	WWP	WUTC	UG-900190	General Rate Increase - Cost of Service/Rate Design
1990	IP	ICC	90-0072	General Rate Increase - Cost of Service/Rate Design
1990	WECO	WUTC	UG-900210	Gas Transportation Rates
1991	PUGET	WUTC	UE-910689	Least Cost Planning Performance
1991	WPPSS	MASON		WNP 2 Revenues & Cost of Power
1991	WPPSS	MASON		WNP 1&3 Issues & Concerns
1991	PUGET	WUTC	UE-901183	Decoupling; Power Supply Cost Recovery
1991	GRANT	FERC	E-9569	Cost Impact of Fish Bypass Systems
1991	AZP	ACC	U-1345-90007	Cost of Service/Rate Design
1992	HECO	HPUC	6998	Cost of Service/Rate Design
1992	HELCO	HPUC	6999	Cost of Service/Rate Design
1992	KE	HPUC	7003	Cost of Service/Rate Design
1992	CGC	WUTC	UG-920062	Gas Tracker
1992	PSD	WUTC	UE-920630	Periodic Rate Adjustment Mechanism
1993	PSD	WUTC	UE-920499	Cost of Service / Rate Design
1993	HECO	HPUC	7310	Avoided Costs of Generation
1993	BPA	BPA	WP-93	Rate Design
1994	BCG	BCUC	IRP	Integrated Resource Planning / Decoupling
1994	WNG	WUTC	UG-931405	Gas Revenue Requirements
1995	BCEC	BCUC		Electric Utility Industry Structure
1995	MECO	HPUC	94-0345	Cost Allocation / Rate Design
1995	GASCO	HPUC	94-0307	Gas Supply; Cost of Service; Rate Design
1996	MECO	HPUC	96-0040	Cost Allocation / Rate Design.
1996	BCG	BCUC		Shareholder Incentives
1996	PSD	WUTC	UE-960299	Special Contract
1996	PSD	WUTC	UE-960195	Merger, Puget Sound Power and Light / Washington Natural GAs
1997	BCG	BCUC		Southern Crossing Pipeline Economics
1998	MECO	HPUC	97-0346	Cost of Service and Rate Design
1999	PSD	WUTC	UE-990267	Colstrip Sale and Accounting Treatment
1999	WPPSS	EFSEC		WNP-4 Site Restoration Options
1999	PSD/WWP/PPL		UE-991255	Centralia Sale and Accounting Treatment
2000	Avista	WUTC	UE-991606	Revenue Requirement; Rate Spread; Rate Design
2000	NWNG	WUTC	UG-000073	Revenue Requirement; Rate Spread; Rate Design
2000	Sumas	EFSEC	99-01	Recommendations on Site Certification Application
2000	PSE	WUTC	UE-001952	Industrial Market-Based Rates
2001	Sumas	EFSEC	99-01	Recommendations on Revised Application
2002	PSE	WUTC	UE-011411	Merger Compliance Rate Filing
2002	PSE	WUTC	UE-011570	General Rate Proceeding
2003	MH	MPUB		Residential Rate Design

ACRONYMS

ACC	ARIZONA CORPORATION COMMISSION
ANGU	ASSOCIATION OF NORTHWEST GAS UTILITIES
AZP	ARIZONA PUBLIC SERVICE COMPANY
BCEC	British Columbia Energy Coalition
BCG	BRITISH COLUMBIA GAS UTILITIES LTD.
BCUC	BRITISH COLUMBIA UTILITIES COMMISSION
BEL	City of Bellevue, Washington
BPA	BONNEVILLE POWER ADMINISTRATION
CBFWA	COLUMBIA BASIN FISH AND WILDLIFE AUTHORITY
GRANT	GRANT COUNTY PUBLIC UTILITY DISTRICT
GRAY	GRAYS HARBOR PUBLIC UTILITY DISTRICT
HECO	HAWAIIAN ELECTRIC COMPANY
HELCO	HAWAII ELECTRIC LIGHT COMPANY
HPUC	HAWAII PUBLIC UTILITY COMMISSION
ICC	ILLINOIS COMMERCE COMMISSION
IP	ILLINOIS POWER COMPANY
IPUC	IDAHO PUBLIC UTILITIES COMMISSION
KE	KAUAI ELECTRIC
MASON	PUBLIC UTILITY DISTRICT #3 OF MASON COUNTY, WASHINGTON
MTP	MONTANA POWER COMPANY
NIGAS	NORTHERN ILLINOIS GAS COMPANY
NMFS	NATIONAL MARINE FISHERIES SERVICE
NRC	ATOMIC SAFETY AND LICENSING BOARD/NUCLEAR REGULATORY COMMISSION
OPUC	PUBLIC UTILITY COMMISSION OF OREGON
PGN	PORTLAND GENERAL ELECTRIC COMPANY
PPW	PACIFIC POWER AND LIGHT COMPANY
PSD	PUGET SOUND POWER AND LIGHT COMPANY
SALEM	SALEM ELECTRIC COOPERATIVE
SAUDER	SAUDER INDUSTRIES, LTD. [CANADA]
SCL	SEATTLE CITY LIGHT
SENATE	WASHINGTON STATE SENATE
SNOPUD	SNOHOMISH COUNTY PUBLIC UTILITY DISTRICT
Sumas	Sumas Energy Corporation
THERM	THERMAL REDUCTION, INC.
TRAILS	OREGON TRAILS ELECTRIC COOPERATIVE
TRIBE	COLUMBIA RIVER INTERTRIBAL FISH COMMISSION
WDW	WASHINGTON DEPARTMENT OF WILDLIFE
WECO	WASHINGTON NATURAL GAS COMPANY
WPPSS	WASHINGTON PUBLIC POWER SUPPLY SYSTEM
WUTC	WASHINGTON UTILITIES AND TRANSPORTATION COMMISSION
WWP	WASHINGTON WATER POWER COMPANY

NOTE: LIST DOES NOT INCLUDE LITIGATION ASSISTANCE

COM-201

Before the Hawaii Public Utilities Commission

Exhibit of
Jim Lazar, Consulting Economist

On Behalf of
County of Maui

Marginal Cost Data For MECO

Docket No. 03-0371

July, 2004

MECO Marginal Cost of Service Study
Adjusted To Roughly Reflect Higher Cost of New Generation

	Per MECO Response to COM-Companies-IR-12			Adjusted Generation Cost Per MECO Response to COM - Companies-IR-11	
	Embedded Full Cost	Marginal Cost @ 1997	Ratio	Generation Cost @ $3000/kw vs. $1559/kw	Ratio
Demand Costs					
Production	$13.66	$17.60	129%	*$33.87*	*248%*
Transmission	$3.01	$2.70	90%	$2.70	90%
Distribution	$2.47	$4.79	194%	$4.79	194%
Total	$19.14	$25.09	131%	$41.36	216%
Energy Costs					
Priority Peak		$0.0543		$0.0543	
Shoulder Peak		$0.0529		$0.0529	
Off-Peak		$0.0493		$0.0493	
Total	$0.0557	$0.0516	93%	$0.0516	93%
Customer Costs					
Schedule R	$20.64	$10.00	48.45%	$10.00	48.45%
Schedule G	$30.80	$15.08	48.96%	$15.08	48.96%
Schedule J	$66.75	$25.08	37.57%	$25.08	37.57%
Schedule H	$89.51	$17.42	19.46%	$17.42	19.46%
Schedule P	$363.30	$70.25	19.34%	$70.25	19.34%
Schedule F	$385.47	$10.00	2.59%	$10.00	2.59%

Calculation of Sample Marginal vs. Embedded Costs
Not Calibrated for Voltage Differentials

	Per MECO Response to COM-Companies-IR-12			Adjusted Generation Cost Per MECO Response to COM - Companies-IR-11	
Schedule P Costs	Embedded Full Cost	Marginal Cost @ 1997	Ratio	Generation Cost @ $3000/kw vs. $1559/kw	Ratio
1000 kw					
60% Load Factor					
kWh/month	432,000				
30% on, 30% Mid, 40% off					
Customer Costs	$363	$70		$70	
Demand Costs	$19,140	$25,090		$41,358	
Energy Costs	$24,062	$22,291		$22,291	
Total:	$43,566	$47,451	**109%**	$63,719	**146%**
Cost/kwh	$0.101	$0.110		$0.147	
Residential Costs					
2 kw diversified demand					
50% Diversified Load Facto					
720 kwh/month					
Customer Costs	$20.64	$10.00		$10.00	
Demand Costs	$38.28	$50.18		$82.72	
Energy Costs	$40.10	$37.15		$37.15	
Total:	$99.02	$97.33	**98%**	$129.87	**131%**
Cost/kwh	$0.138	$0.135		$0.180	

COM-Companies-SOP-IR-11

Page 22, Avoided Utility System Costs: Provide the most recent estimates by MECO of the cost of providing new peaking generating facilities to meet increases in peak demand, and the cost of providing new baseload or combined cycle generating facilities to meet increases in baseload requirements.

HECO Response:

The next baseloaded generating unit to be added to the Maui electrical grid in accordance with its IRP-2 Plan is Maalaea 18 (M18), a nominal 18 MW steam turbine generator. M18 is targeted for commercial operation in September 2006 and will complete the Maalaea Dual-Train Combined Cycle No. 2 Plant. Maalaea 17 and M19, two nominal 20 MW combustion turbines, were installed previously and have been operating in peaking status awaiting conversion to combined cycle operation with the installation of M18. The estimated capital cost for M18 including escalation and AFUDC in 2006 dollars is $43.5 million.

The next generating unit to be added to the Maui electrical grid in accordance with its IRP-2 Plan is Waena 1(W1), a nominal 20 MW combustion turbine. W1 is targeted for commercial operation in 2010. The estimated capital cost for W1 including escalation and AFUDC in 2010 dollars is $70.5 million.

COM-Companies-SOP-IR-12

Page 22, Avoided Utility System Costs: Provide the most recent marginal cost of service study prepared on the MECO system showing marginal generation, transmission, and distribution capacity costs, and marginal energy costs.

HECO Response:

The latest marginal cost study prepared for MECO was filed in MECO's last rate case, Docket No. 97-0346. Please see the exhibit from that proceeding, attached as pages 2-5.

MAUI ELECTRIC COMPANY, LIMITED
TEST YEAR 1999 DOCKET NO. 97-0346
MAUI DIVISION

COMPARISON BETWEEN UNIT EMBEDDED COSTS
UNIT MARGINAL COSTS

	Embedded Full Cost	Marginal Cost[1]
Demand Costs	($/kw/month)	($/kw/month)
Production	$13.66	$17.60
Transmission	$3.01	$2.70
Distribution[2]	$2.47	$4.79
Total	$19.14	$25.09
Energy Costs	(¢ / kwh)	(¢ / kwh)
Priority Peak	N/A	5.43
Shoulder Peak	N/A	5.29
Off-Peak	N/A	4.93
Total	5.57	5.16
Customer Costs	($/customer/month)	($/customer/month)
Schedule R	$20.64	$10.00
Schedule G	$30.80	$15.08
Schedule J	$66.75	$25.08
Schedule H	$89.51	$17.42
Schedule P	$363.30	$70.25
Schedule F	$385.47	$10.00

[1] At Secondary Voltage Level
[2] Marginal distribution substation and marginal distribution facilities costs.

COM-202

Before the Hawaii Public Utilities Commission

Exhibit of
Jim Lazar, Consulting Economist

On Behalf of
County of Maui

Utility Connection Charges and Credits

Docket No. 03-0371

July, 2004

UTILITY CONNECTION CHARGES AND CREDITS
Stepping Up the Rate of Energy Efficiency Implementation

Jim Lazar
Consulting Economist
Olympia, Washington U.S.A.

Presented to:
Second International Conference on Energy Consulting
Graz, Austria
September 25-27, 1991

INTRODUCTION

One of the most severe barriers to implementation of cost-effective energy conservation is the fact that the person or company making the decision of what type of equipment to install in a building, or even of what building to construct, is often not the same person who will pay the energy bills over the life of the building. Because the builder will not have to pay the energy costs resulting from these decisions, they have little incentive to invest in energy-conserving measures.

This problem is most obvious in the residential sector, where contractors who build new single-family or multi-family housing select the type of construction, the type of lighting systems, the type of heating and water heating equipment, and even the major appliances. The home buyer or apartment renter -- who will ultimately pay the energy bill -- has little or no opportunity to influence these decisions. While a more efficient refrigerator may cost as little as $50 more than a standard model, the builder perceives no benefit to such an expenditure -- even though the energy savings each year may be great enough to repay the investment in just a year or two.

In the commercial sector it is often no different. General contractors construct buildings on behalf of limited partnerships, which then rent the facilities with leases where the tenants are responsible for the energy bills. More efficient equipment provides no benefit to either the builder or the building owner. The economics are even more stark in this sector. More efficient and more precise lighting can save operating costs, the installation of fewer fixtures can save capital funds and cooler operation of efficient lighting systems can reduce the size of chillers needed to provide a comfortable structure. Such precision lighting systems, however, require high quality engineering, which is itself a significant capital expenditure.

The most common approach in the United States for encouraging energy efficiency in new buildings is for governmental agencies to adopt building codes requiring specified levels of energy efficiency. While beneficial, codes are often poorly written, ineffectively enforced, and chronically out of date. One way that utilities and other policy makers can influence the efficiency of new buildings is through connection charges and credits for electric utility service based upon the efficiency of the structure.

This paper examines several different approaches which have been considered or implemented in the Pacific Northwest region of the United States for achieving electrical energy efficiency in new building, and compares the effectiveness of each approach.

THE FAILURE OF THE MARKETPLACE

A good western economist should theoretically argue against any interference with competitive market forces, which we supposedly believe will result in the maximum cost-effective energy efficiency as buyers and renters of buildings demand that their landlords install measures which will save them money. Unfortunately the market theory fails when energy efficiency is at issue primarily because the conditions necessary for an efficient market are utterly lacking. Market theory holds that competition will produce an efficient allocation of goods and services under the following conditions:

1) All goods are perfectly substitutable;
2) All buyers and sellers have perfect information about the marketplace;
3) No buyer or seller is large enough to influence the market; and
4) Capital is highly mobile and will find it's way to the highest return.

Obviously these conditions are not met in the marketplace for new structures. Energy efficiency, which is a capitalized item, is not "perfectly" substitutable for electricity purchases, which are an operating expense. Most buyers of buildings have far from perfect information about building energy economics. In the residential sector, renters may have almost no information at all. Major contractors and equipment vendors may be large enough to influence the choice of equipment installed through cooperative ventures with builders; this may result in inefficiency when neither the builder nor the vendor will be paying the energy bills. Finally, access to capital is not equal for all potential borrowers, and it may be easier for a builder to obtain capital than for a vendor of energy-conserving equipment to do so.

Energy conservation is not perfectly substitutable for energy generation for several reasons. One important difference lies in the fact that electric utilities constructing generating plants to serve new buildings typically construct long-lived facilities and finance them with long-term securities. Buyers and renters typically have much shorter time perspectives, desiring a recovery of their investment (payback period) of as little as two to four years. This is not "perfect" substitution.

The end result is that "pure competition" does not exist in the market for energy efficiency, and we should not expect an efficient allocation of resources without intervention in the marketplace.

THE PACIFIC NORTHWEST

The Pacific Northwest region of the United States includes the states of Washington, Oregon, Idaho, and Western Montana. The largest cities are Seattle, Portland, Spokane, and Boise. It is divided by the Cascade mountain range, with forests west of the mountains, and desert to the east. The primary economic activities are aircraft construction (Boeing), forestry, grain and vegetable farming, and computer software development. The region is characterized by rapid economic growth in urban areas of western Washington and Oregon, and stagnant economic conditions in the rural areas.

The region enjoys the largest hydroelectric power system in the United States, and typical retail electric charges prior to 1980 were approximately \$.01/kwh, less than half the average for the nation. Today, electricity prices have increased dramatically, but, at \$.03- \$.05/kwh, remain at about half the level of most of the country. These low prices have led to much greater dependency on electricity, relative to other fuels, in the Pacific Northwest, and to rapid historical growth in electrical demands.

In 1980, the fast-growing region was facing the prospect of a severe electric power shortage, and the United States Congress enacted the Pacific Northwest Electric Power Planning and Conservation Act (the Act). The anticipated power shortage, the passage of the Act, and the creation of the Northwest Power Planning Council, which is responsible for implementing the Act, have created an atmosphere where energy efficiency planning is a focus of the region.

The Act directed the creation of a regional power plan, and required that "Model Conservation Standards" be implemented designed to achieve all conservation which was cost-effective to the region and economically feasible for consumers. To make the "economic feasibility" issue easier to satisfy, the Act directed that consumers be given financial assistance where necessary to assure that cost-effective conservation measures were achieved.

When the power shortages loomed a decade ago, due primarily to delays in construction of new electrical generating plants, utilities reacted by implementing some of the first energy conservation programs in the nation. Some state regulatory bodies stepped in with creative approaches. The Bonneville Power Administration, a wholesale electric supplier to numerous small electric distribution utilities in the Northwest, began financing locally implemented conservation measures.

The power shortages projected for the 1980's never materialized, primarily due to very large increases in electric prices required to pay for the (delayed) new generating plants, several of which were never completed. The price increases caused a great deal of price response in the form of conservation, fuel substitution, and curtailment of operations. However the decade served as a laboratory for testing many alternative methods of meeting electrical requirements for the region.

The goal of the Act was to evaluate energy conservation and energy supply measures in a common manner, and to choose the most economical based upon the life-cycle economics of each. The term "life-cycle costing" generally refers to the life-cycle acquisition and energy costs. An evolution of this, "value engineering" incorporates the same concepts, but includes recognition of such costs as labor savings associated with less frequent replacement of compact fluorescent replacements for incandescent lamps.

After a decade, progress has been slow but steady. A large number of different programs have been attempted. Some have been extremely successful. Others have not. Among the least successful have been attempts to amend building codes to require efficiency measures to be built in. Among the most successful were direct policies implemented by electric utilities to require improved efficiency as a condition of service, or to impose high fees on builders of less efficient structures based on the expected energy use of those structures.

RESIDENTIAL BUILDING CODES

The entire history of building codes for energy efficiency in the Pacific Northwest has been characterized by "following the market." Codes tend to be consensual, and barely better than the lowest efficiency level being achieved in the marketplace. Once the majority of contractors and builders, driven by market forces, have implemented a standard of energy efficiency, it then becomes politically feasible for governmental agencies to adopt a mandatory standard.

In the residential sector, once floor, ceiling, and wall insulation and insulated glazing became standard practice, they were imposed by code. In the commercial sector, only after the incandescent lamp became archaic did codes place limitations of any kind on the wattage per square foot of lighting to be installed.

The first building codes for energy efficiency were implemented in about 1977. These required only minimal upgrades to then-conventional building techniques. Modifications to the codes which increase the required level of energy efficiency have been implemented throughout the region in stages, most notably in 1980, 1985, and 1991. However, the improved codes typically have not kept pace with improvements in energy conservation technology.

The most recent residential code in the Seattle area, for example, requires only R-38 insulation in attics and R-19 insulation in walls, although R-49 and R-27 are now clearly cost-effective. Technological evolution, such as heat-mirror glazing, compact fluorescent lighting systems, high-efficiency appliances, and heat-recovery ventilating systems are still not required.

Each code amending process has been characterized by bitter fights between conservation advocates, including most electric utilities, and builder groups. Legislative delays have pushed back to 1991 implementation of a code which was to take effect in 1986, at the direction of the Northwest Power Planning Council, and the code's efficiency standards were weakened in the process. Frustrated with the political process of adopting building codes, some local utilities have taken innovative approaches involving connection fees and standards for new buildings.

CONNECTION FEES AND STANDARDS -- EARLY EXPERIMENTS

Several attempts to impose energy efficiency measures through direct utility charges and standards have been made in the region. Some of the earlier efforts may have failed, but in the process, may have created the potential for future success.

State of Idaho

The first regional experiment with a connection standard or fee was implemented in 1979 by the state of Idaho Public Utilities Commission (IPUC). The IPUC directed the Washington Water Power Company to begin charging $50 per kilowatt of connected load for new residential structures. Given a typical installed size of 20 - 30 kilowatts for electric heating systems, this imposed a $1000 - $1500 additional charge on builders. The intended effect was to shift new electric heating installations to natural gas, a lower cost fuel, or to at least cause builders installing electric heat to more fully insulate the structures to reduce the size of the connected heating load.

The implementation of this fee per connected kilowatt immediately resulted in significant improvements in the energy efficiency of the new buildings constructed, and did succeed in shifting new construction to use natural gas for space and water heating purposes. The IPUC was encouraged by these results, and convened a proceeding to establish a "point system" by which new residential structures would pay a progressively increasing connection charge if all available and cost-effective energy conservation measures were not installed.

Builders reacted vigorously to this policy initiative on two fronts. First, they succeeded in having the regulations invalidated by the state Supreme Court on the grounds that these type of standards exceeded the legal authority of the IPUC. Second, builders persuaded the legislature to more specifically limit the authority of the IPUC. The experiment came to a rapid end; the $50/kw fee was eliminated. However, the precedent was not lost, and this approach was successfully utilized in the state of Washington a decade later.

State of Washington

In 1979, Puget Power, the largest electric utility in the state, requested a moratorium on new connections of electric resistance space and water heat in areas where natural gas service was available. An "unholy alliance" of natural gas utilities, conservation advocates, industrial power users, and low income citizen advocates succeeded in persuading the Washington Utilities and Transportation Commission to order a complete ban on new electric resistance space and water heating installations. The only exceptions granted were for superinsulated buildings, and as backup systems to solar heating systems.

Builders again succeeded in the courtroom where they had failed in the regulatory arena. A local judge invalidated the moratorium, and before it could be reviewed by an appellate court, the passage of the conservation Act referenced earlier created a completely different wholesale power market in which Puget Power could obtain supplies not previously available to it. The moratorium was never implemented.

Oregon

Building construction standards in the state of Oregon adopted in 1985 allowed a form of perimeter crawl space insulation which is substantially inferior to conventional underfloor insulation. Salem Electric a small electric utility serving 12,000 households, implemented a $200 connection surcharge during 1989 for any new home which was not fitted with full underfloor insulation. The amount was selected to equal the additional cost of installing underfloor insulation [so that builders would be indifferent from an initial cost perspective.] The program was initially successful -- nearly 100% of new homes were fitted with underfloor insulation. It was never challenged in court action by builders. Within a year the state building standards were modified to require underfloor insulation, and the program became unnecessary. At that time, the program was modified into an incentive mechanism to encourage a higher level of energy efficiency than required by code, but the penalty provision was abandoned.

THE MODEL CONSERVATION STANDARDS

The Northwest Power Planning Council adopted residential model conservation standards (MCS) in 1983, which were intended to be in operation throughout the region by 1986. The standards called for new residential structures to have heating requirements less than one half the level required by conventional construction as of 1983. In theory, areas within the Pacific Northwest which did not adhere to the standards by 1986 were to be subjected to surcharges of up to 10% on the price of wholesale power purchases from the Bonneville Power Administration.

City of Tacoma

The first governmental body in the region to adopt the MCS was the city of Tacoma, a community of about 200,000 people about 50 km south of Seattle. In 1984, the city council implemented the standards throughout the city limits. These were expanded in 1985 to include areas outside the incorporated city which were served by the Tacoma municipal lighting system. This was the first utility-imposed efficiency standard in the region. It was challenged by builder groups, but the utility prevailed in court. While enforcement may have been somewhat lax, this requirement did succeed in greatly improving the level of energy efficiency in new homes in the Tacoma area.

Super Good Cents

In an effort to encourage higher efficiency and to train builders in efficiency construction techniques, the Bonneville Power Administration initiated a program called "Super Good Cents" (SGC) in 1984. It provides for payments of up to $2000 to builders who constructed electrically heated homes meeting the SGC standards. The program has remained in operation since that time. After seven years of operation, the program is still only reaching about 28% of all new electrically-heated single family homes, 26% of new multi-family apartment units, and 8% of new factory-built homes.

CODES AND INCENTIVES FOR COMMERCIAL STRUCTURES

Commercial structures are much more complex than residential buildings, and it is more difficult to design and implement building codes to achieve desired energy efficiency in this sector. Although there is a commercial MCS, it is not nearly as strict as the residential MCS. Various other approaches have been attempted to improve energy efficiency in new commercial buildings in the region.

Design Assistance

The Design Assistance programs are of the greatest interest to energy consultants. The programs operated by different electric utilities have different names, such as Design Plus, Energy Edge, and Energy Smart Design. In each of these programs the utilities pay for all or part of the cost of professional design assistance to builders of new commercial buildings in order to ensure that cost-effective conservation measures are evaluated. The builder is responsible for the actual cost of installing the measures, but they are often very inexpensive.

An evaluation of the design assistance program by the Washington State Energy Office concluded that only about half of the recommended cost-effective measures are installed. Building aesthetics, personal preferences of builders and designers, and continuation of past practices all were influential in the rejection of cost-effective measures. While design assistance has the potential to become a valuable tool, in the absence of conservation financing mechanisms or mandates of any type, it does not accomplish the goal of ensuring that all cost-effective measures are installed.

For example, improved lighting efficiency may mean installing fewer fixtures, and reduced lighting energy levels can reduce the need for air conditioning capacity. In many cases, the increased energy efficiency reduces the initial cost of construction, and also reduces annual operating expenses.

UTILITY CONNECTION CHARGES AND STANDARDS

Mason County Public Utility District #3 Hookup Charge

Frustrated with slow progress on adoption of statewide energy codes, the Mason County Public Utility District (PUD), which serves about 20,000 customers in Washington state, adopted a $2000 hookup charge for new homes which do not meet the MCS. It was intended to recover the portion of the costs of serving inefficient structures which are not recovered in current electric prices. A novel aspect of the Mason PUD approach is that it applies equally to conventional site-built homes and to factory built housing which is brought to the site by truck. Efficiency requirements for factory-built homes are governed by federal standards, not by the states. The Mason PUD approach circumvents this preemption because is not technically a "standard." Mason PUD operates the Super Good Cents program, so home builders and buyers are faced with a choice between receiving a payment of $1000 - $2000 if they build homes which meet the MCS, or paying a penalty of $2000 if they do not.

In 1990, the first full year of operation, the Mason PUD hookup charge reached approximately 98% of conventionally built housing, and 85% of new manufactured housing units. This is a much higher rate of achievement than any of the incentive programs such as Super Good Cents alone have achieved. It is important to note that with such high participation rates, the program is producing virtually no revenue. This is consistent with the goal of the utility to achieve the desired efficiency, rather than to collect high surcharges.

The Mason PUD approach is currently being considered by a number of other electric utilities in the region. Clallam County PUD, another small electric utility in Washington, simply imposed an absolute ban on new connections of homes which did not meet the MCS. This was in effect for about a year before an improvement in the state building code which achieved nearly the same level of efficiency took effect in July, 1991.

Snohomish County Public Utility District $200/kw Progressive Charge

The Snohomish Public Utility District, which serves some 200,000 customers in the fast-growing area north of Seattle, is considering numerous strategies to reduce the rate of growth in electricity demand. These include participating in the Super Good Cents residential program, the Energy Smart Design commercial program, and even a cooperative (and very controversial) venture with the local natural gas distribution utility to shift electric water heating to natural gas.

The utility is currently considering a service connection charge for new commercial buildings which would be based on the requested level of peak service. The basic connection charge would be $200 per kilowatt. While significantly less than the cost of facilities needed to serve growing loads, this is an amount sufficient to gain the attention of builders, and is often an amount sufficient to cover the cost of energy efficiency measures. If builders reduce the demand of a new building on the utility they reduce their initial costs by $200 multiplied by the reduced demand. Depending on the conservation alternatives available for a particular building, the cost of doing so may be significantly less than $200 for each kilowatt of demand reduction.

Under the proposal now being considered, this $200 amount would be reduced to $150 per kilowatt if the builder agreed to participate in the Energy Smart Design program to identify cost-effective conservation options. It would be further reduced to $50 per kilowatt if all cost-effective measures identified in the design assistance process were installed. The fee would be completely waived if all cost-effective measures were installed and the building owner agreed to make at least a portion of the connected load subject to interruption during the highest peak hours of the year.

Mason PUD #3 Commercial Line Extension Policy

Mason County PUD #3, the same utility which implemented the connection charge for new residential structures not meeting the MCS, is now considering a similar approach for new commercial customers. Currently the utility typically extends service to commercial customers, including distribution line extensions, transformers, services, and meters, at no direct charge. Under the proposed policy, where customers do not install all conservation measures determined to be cost-effective as a result of a design assistance program, they would be required to pay the entire cost of the service connection. The current policy would apply to those buildings where all cost-effective conservation measures are installed.

New School Design Standards

The state of Washington is currently experiencing rapid population growth, and there is a continuing need for new public schools. Nearly 300 locally controlled school districts are responsible for the construction process, but a large portion of the construction and operating funds are supplied by the State. The state Superintendent of Public Instruction, in cooperation with the Washington State Energy Office, adopted rules in 1990 which require that designs for new public schools be subjected to engineering analyses of cost-effective lighting, heating, and cooling alternatives. A life-cycle costing approach is used to determine cost-effectiveness over the entire useful life of the building.

The standards require approximately 30% greater efficiency than the level permitted by the current commercial building codes. Any increase in state control typically meets some resistance among school districts which historically have enjoyed a greater measure of local control, but the design review process is in place and appears to be working reasonably well. While there is not enough data available to conclude that the savings are as expected, it is clear that lighting levels have been reduced, that use of electronic ballasts has increased, and that the use of electric resistance heating has declined in favor of greater use of natural gas compared with patterns in existence before 1990.

APPLICABILITY IN EMERGING EASTERN EUROPEAN MARKET ECONOMIES

Eastern European economies are characterized by inadequate and inefficient electrical generating capacity, a need for massive construction and reconstruction of residential units and commercial buildings, and limited capital availability. Clearly it is economically unsatisfactory to limit energy efficiency investments in new buildings if the result is to require much larger capital outlays and operating expenses for new electrical generating capacity. In a planned economy (in theory), these tradeoffs between capital investment in a building and capital investment in the utility sector are given full consideration. In a market economy, they probably will not. The ability of these economies to grow may depend on the efficient allocation of capital -- an outcome which is unlikely to occur without some method to ensure that builders take the impacts of their decisions on the utility sector into account when designing and constructing new facilities.

Design assistance programs, incentive payments, and codes have all proven relatively ineffective at achieving cost-effective energy goals. Connection standards and connection charges based upon the amount of connected electrical load have been far more effective.

CONCLUSION

Building codes are only one of a number of strategies available to encourage residential and commercial energy efficiency, and their effectiveness is constrained by political considerations. Incentive programs, such as Super Good Cents, which provide funding for greater energy efficiency, but do not mandate increased efficiency, are beneficial, but do not typically achieve high participation rates. Other options, such as hookup connection charges and standards, which force builders to make decisions on energy efficiency early in the construction process, are proving more effective at achieving desired energy goals. By *internalizing the cost of inefficiency* into the builder's costs, hookup charges appear to be a way to achieve a cost-effective market response to energy costs.

If a policy goal is to achieve all cost-effective conservation measures, a system of connection standards and inefficiency surcharges may prove extremely effective at motivating the marketplace.

COM-203

Before the Hawaii Public Utilities Commission

Exhibit of
Jim Lazar, Consulting Economist

On Behalf of
County of Maui

Southern California Edison Standby Rate

Docket No. 03-0371

July, 2004

Schedule S
STANDBY

APPLICABILITY

Applicable to customers taking service under a regular service rate schedule and where a part or all of the electrical requirements of the customer can be supplied from a generating facility as defined, interconnected, and operated in accordance with Rule 21. A generating facility may be connected for: (1) parallel operation with the service of SCE; or (2) isolated operation with standby or breakdown service provided by SCE by means of a double throw switch. Any customer served under a time-of-use rate schedule using electric generation technology that meets the criteria as defined in Rule 1 for Distributed Energy Resources Generation is exempt from the otherwise applicable Standby and Generation Reservation Charges for the periods specified in such definition. Solar generating facilities up to 1MW in installed nameplate capacity that do not sell power to the grid are exempt from paying charges under this Schedule.

As set forth in D.03-04-060, effective April 17, 2003, Distributed Energy Resources Generation operated in combined heat and power applications and renewable resources, as defined in D.02-10-062, sized 5 MW or smaller, installed between May 1, 2001 and December 31, 2004, that meet all other criteria in Section 353.1 of the Public Utilities Code are exempt from the otherwise applicable Standby and Generation Reservation Charges of this Schedule until June 1, 2011. The December 31, 2004 installation date to qualify for the exemption will be extended by six months and continue to be extended on a six month basis until the date of the Commission's decision issued on SCE's 2003 General Rate Case (GRC) rate design application. The same exemption from such charges is also applicable to Ultra Clean resources, as defined in Section 353.2 of the Public Utilities Code, sized 5 MW or smaller, installed between January 1, 2003 and December 31, 2005, that meet all other criteria in Section 353.1 of the Public Utilities Code, with automatic extensions of the December 31, 2005 installation deadline in six-month increments until a decision is issued on utility rate design applications. (N)

TERRITORY

Within the entire territory served.

(L)

(Continued)

Schedule S
STANDBY

Sheet 2

(Continued)

RATES (L)

	Delivery Service							Gen[8]	
	Trans[1]	Distrbtn[2]	NDC[3]	PPPC[4]	PUCRF[5]	DWRBC[6]	Total[7]	URG	DWR
Standby Charge - $/kW of Standby Demand/Meter/Month									
Below 2 kV	0.30	3.96					4.26	2.14	
From 2 kV to 50 kV	0.23	4.10					4.33	2.27	
Above 50 kV	0.17	0.27					0.44	0.21	
Generation Reservation Charge - $/kW of Standby Demand/Meter/Month									
Below 2 kV	0.00	0.00					0.00	0.37	
From 2 kV to 50 kV	0.00	0.00					0.00	0.36	
Above 50 kV	0.00	0.00					0.00	0.35	

1 Trans = Transmission and the Transmission Owners Tariff Charge Adjustments (TOTCA) which are FERC approved. The TOTCA represents the Transmission Revenue Balancing Account Adjustment (TRBAA) of negative $0.00053 per kWh, Reliability Services Balancing Account Adjustment (RSBAA) of $0.00015 per kWh, and Transmission Access Charge Balancing Account Adjustment (TACBAA) of $0.00027 per kWh.
2 Distrbtn = Distribution
3 NDC = Nuclear Decommissioning Charge
4 PPPC = Public Purpose Programs Charge (includes California Alternate Rates for Energy Surcharge where applicable.)
5 PUCRF = The PUC Reimbursement Fee is described in Schedule RF-E.
6 DWRBC = Department of Water Resources (DWR) Bond Charge. The DWR Bond Charge is not applicable to exempt Bundled Service and Direct Access Customers, as defined in and pursuant to D.02-10-063, D.02-02-051, and D.02-12-082.
7 Total = Total Delivery Service rates that are applicable to both Bundled Service and Direct Access (DA) Customers, except DA Customers are not subject to the DWRBC rate component of this Schedule but instead pay the DWRBC as provided by Schedule DA.
8 Gen = Generation – The Gen rates are applicable only to Bundled Service Customers. When calculating the Energy Charge, the Gen portion is calculated as described in the Billing Calculation Special Condition of this Schedule. (L)

Applicable Schedule Charges (to be added to Standby Charge and Generation Reservation Charge): (L)

The Facilities Related Component of the Demand Charges designated in the applicable regular service rate schedule shall be applied to all kW of Facilities Related Billing Demand in the current month less Standby Demand but in no case applied to a difference less than zero. All other charges including any minimum charges and provisions of the applicable regular service rate schedule designated in the generation interconnection agreement or the Contract for Electric Service shall apply.

For customers served under this Schedule whose regular service rate is Schedule TOU-8, the Standby and Generation Reservation Charges are excluded from the Peak Period and Average Rate Limiter calculation provided in Schedule TOU-8. (L)

(Continued)

Schedule S
STANDBY

(Continued)

SPECIAL CONDITIONS

1. Contract: A Contract is required for service under this schedule.

2. Generation Interconnection Agreement: A generation interconnection agreement with the customer shall be required for service under this Schedule where the cogeneration or small power production source is connected for parallel operation with the service of SCE.

3. Standby Demand: The level of standby demand shall be set forth in the generation interconnection agreement or Contract for Electric Service. The level of standby demand shall be determined by SCE and shall be the lower of (a) the nameplate capacity of the customer's generating facility; or (b) SCE's estimate of the customer's peak demand.

   SCE reserves the right to install, at the customer's expense, a demand meter to measure the customer's demand. The highest recorded demand shall be used to determine the customer's level of standby demand.

4. Allowance for Maintenance: After a customer has received service under this Schedule for a period of six months, the added demand created by scheduled maintenance outages of the generating facility will be ignored for purposes of determining the Time Related Component of the demand charges under the applicable regular service rate schedule in months acceptable to SCE upon advance notice and subject to prevailing system peak conditions, subject to the conditions stated herein. Such conditions are that customer schedule and perform maintenance in accordance with the advance notice, outage duration, and outage frequency requirements set forth in the generation interconnection agreement, and following the period of scheduled maintenance, customer shows, to the satisfaction of SCE, what part of the recorded maximum demand utilized for billing in any of the months was added demand due to outage for such scheduled maintenance. This condition is applicable for one continuous outage per year of up to 30 consecutive days.

   SCE may, at its option, require that the customer defer scheduled maintenance. If scheduled maintenance is deferred, SCE will allow an outage for maintenance at a later date with allowance for maintenance in accordance herewith. Notice of such deferral, if required, shall be provided to the customer not less than 60 days prior to customer's scheduled outage date, except in the event of emergency. The Allowance for Maintenance applies only to customers served on a rate schedule which has a Time Related Component within the demand charge.

5. Excess Energy: For parallel connections, the customer may sell power to SCE under the terms of the generation interconnection agreement.

(Continued)

Schedule S
STANDBY

Sheet 4 (T)

(Continued)

SPECIAL CONDITIONS

6. Billing Calculation: A customer's bill is calculated according to the rates and conditions above.

Except for the Energy Charge, the charges listed in the Rates section are calculated by multiplying the Total Delivery Service rates and the Generation rates, when applicable, by the billing determinants (e.g., per kilowatt [kW], kilowatthour [kWh], kilovar [kVa] etc.),

The Energy Charge, however, is determined by multiplying the total kWhs by the Total Delivery Service per kWh rates to calculate the Delivery Service amount of the Charge. To calculate the Generation amount, SCE determines what portion of the total kWhs is supplied by the Utility Retained Generation (URG) and the Department of Water Resources (DWR). The kWhs supplied by the URG are multiplied by the URG per kWh rates and the kWhs supplied by the DWR are multiplied by the DWR per kWh rate and the two products are summed to arrive at the Generation amount. The Energy Charge is the sum of the Delivery Service amount and the Generation amount.

For each billing period, SCE determines the portion of total kWhs supplied by SCE's URG and by the DWR. This determination is made by averaging the daily percentages of energy supplied to SCE's Bundled Service Customers by SCE's URG and by the DWR.

a. Bundled Service Customers receive Delivery Service from SCE and receive supply (Gen) service from both SCE's URG and the DWR. The customer's bill is the sum of the charges for Delivery Service and Gen determined, as described in this Special Condition, and subject to applicable discounts or adjustments provided under SCE's tariff schedules.

b. Direct Access Customers receive Delivery Service from SCE and purchase energy from an Energy Service Provider. The customer's bill is the sum of the charges for Delivery Service determined as described in this Special Condition except that the DWRBC rate component is subtracted from the Total Delivery Service rates before the billing determinants are multiplied by such resulting Total rates; plus the applicable charges as shown in Schedule DA and subject to applicable discounts or adjustments provided under SCE's tariff schedules.

(Continued)

SPECIAL CONDITIONS (Continued)

7. Separate Service Connections and Meters For Generating Facilities. Under this Special Condition, SCE may at its option, provide generating facilities with an additional service connection and meter for reliability purposes (back-up service) separate from the existing service connection and meter (main service). Back-up service shall be provided to customers served under Schedule TOU-8 at the main service and only when SCE's service, including standby service provided under this Schedule, is not available at the main service. Service under this Special Condition does not act as a guarantee of uninterrupted service. Furthermore, back-up service shall not be used to serve the load that is curtailed/interrupted under another load curtailment program in which a participating customer agrees to curtail/interrupt its load when called upon to do so under the terms of such program, or the curtailed load of a circuit during an Independent System Operator (ISO) Stage III Emergency Rotating Outage. Service under this Special Condition is subject to meter availability.

a. Contract. A contract is required for service under this Special Condition. In addition to the back-up service contract, the customer shall have executed an added facilities contract for the back-up service facilities.

b. Parallel Connections. No parallel connection of the main service and the back-up service shall be permitted. SCE shall control the transfer of the customer's load from the main service to the back-up service.

c. Removal from Special Condition. The customer is ineligible for service under this Special Condition when the customer discontinues or becomes ineligible for service under Schedule TOU-8 at the main service. Effective with the date of such ineligibility, the back-up service contract and service under this Special Condition and the added facilities contract shall terminate. The customer may be subject to the termination provision of the added facilities contract for the back-up service facilities. In addition, if at any time while receiving service under this Special Condition the customer elects to terminate its added facilities contract for the back-up service facilities, service under this Special Condition shall expire concurrent with the effective date of such termination.

d. Rate Schedules for Back-Up Service. Back-up service shall be provided under the applicable general service rate schedule for the load receiving such back-up service, except that when the back-up service maximum demand is, in the opinion of SCE, expected to exceed 500 kW, service shall be provided under Schedule TOU-8-BU. For customers with a maximum demand of 500 kW or less served under a demand metered general service rate schedule, for each billing period the Customer Charge shall be $8.63 per meter per month and the customer shall not be charged the Facilities Related Component of the Demand Charge. When back-up service is provided under a non-demand metered general service rate schedule the Customer Charge shall be $0.1675 per meter per day.

e. Back-Up Service Not A Guarantee Of Uninterrupted Electric Service. Back-up service under this Special Condition does not prevent a generating facility from being subject to rotating outages. In the event the generating facility is designated by the California Public Utilities Commission's decisions or staff as exempted essential use, the back-up service shall not be deemed as essential nor exempt from rotating outages.

COM-204

Before the Hawaii Public Utilities Commission

Exhibit of
Jim Lazar, Consulting Economist

On Behalf of
County of Maui

Performance-Based Ratemaking

Docket No. 03-0371

July, 2004

Incentive and Performance-Based Ratemaking Options for India

Conducted for USAID Mission, New Delhi
Presented by: The Energy Group
Institute for International Education
5 September, 2000

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Order of Presentation

- What are Incentive Regulation and Performance-Based Ratemaking?
- History of IR and PBR
- Types of IR and PBR
- Discussion / Break
- Case Studies and What to Look for In Alternative Regulatory Systems.
- Lunch
- Open Discussion of All Participants
- Panel Discussion
- Training Needs Assessment
- Adjourn

Jim Lazar
Consulting Economist

- Research staff, Washington State Legislature, 1977 - 82
- Independent Consultant on Utility Regulation since 1982
- Clients include state Regulatory Commission, Consumer Advocates, Public Utilities
- International work in Ireland, New Zealand, Philippines, India, Kyrgyzstan

Jim Fischer
Attorney and Consultant

- Former Consumer Advocate, Missouri Public Counsel (1976 - 1983)
- Former Regulatory -- Vice Chairman of Missouri Public Service Commission (1984 - 1990)
- Attorney and Consultant -- Represents public utilities, municipalities, and other interests before regulatory agencies

Comparison of Traditional and Alternative Forms of Ratemaking

- Traditional Ratemaking
  - Rate Base x Rate of Return + Expense = Revenue Requirement
  - No specific incentive to minimize costs or achieve superior service
- Incentive and Performance-Based Ratemaking
  - Cost savings flow at least partly to investors
  - Rewards and penalties for superior / inferior performance

Performance-Based Regulation

- Definition: A system of regulation which rewards the utility based on their achievement of specific performance measurements.
  - Reliability and adequacy of service
  - Quality of customer service
  - Fuel use efficiency

Incentive Regulation

Definition: A system of regulation which provides a means for the utility to earn a higher return over a multi-year period if it is able to reduce expenses associated with providing service.

- Measure present conditions
- Set realistic goals for improvements
- Reward utilities for improvement toward the goals

All Regulation Contains Incentives of Some Kind

Traditional Regulation Incentives

- Capital-intensive, since return based on capital
- Little incentive to control quantity or cost of labor
- Focus on flow-through costs
  - Fuel Clause: the "anti-incentive"
- Customer service quality may be driven by fear of appeal to regulators, not desire to serve consumers, particularly if monopoly status is assured

What are the goals of your effort? Incentives Should Match Objectives

- Higher Reliability?
- Improved Safety?
- Different Resource Mix?
- Reduced Risk Exposure for Utilities or Consumers?
- Faster hookups of new customers?
- Better Customer Service?
- Lower Cost Service?
- Better Cooperation Between Utilities?

Tools for Achieving Goals and Objectives for Electric Utilities

Technical

- Reduced line losses
- Reduced power diversion
- Improved frequency control
- Improved power factor
- Optimal dispatch

Economic / Regulatory

- Improved Collection
- Better Accounting
- Cost-Based Tariffs

Safety Standards

Cooperation Programs

Objectives Should Be Clearly Understood by All

- Cannot achieve all goals simultaneously; need to prioritize objectives
- Public process to establish priorities
- Commission, utility, and the public should share the same understanding of the goals, objectives, expected rewards and penalties, and the process for evaluation
- Need a process to correct a flawed program

Types of Incentive and Performance-Based Ratemaking

- Rate Case Moratoriums
- Price Caps
- Fuel Efficiency Incentives
- Portfolio Incentives
- DSM Incentives
- Service Quality Indexes

Issues for India In Performance-Based and Incentive Regulation

- Financially weak utilities
- Very high technical losses
- Very high non-technical losses
- Poor voltage and frequency control
- Near-zero tariff for irrigators
- Excessive tariff for industrial users
- Extremely sensitive political issues for irrigators and residential consumers

Addressing India's Needs With Regulatory Alternatives

- Provide financial strength for utilities to solve problems.
- Provide incentives so that utilities focus on the most important problems.
- Win consumer support for tariff and service reforms by providing assurance that consumers will enjoy improved quality and reliability of service in the long run.

Purpose of Presentation

- History of Incentive Based Regulation
- 1989 NARUC Resolution
- Experiences with Incentive Based Regulation
- Issues Raised for Regulators' Evaluation

History of PBR and Incentive-Based Regulation

- PBR has been part of the regulation of energy industries for almost 150 years.
- Focused Incentives include targets for capacity factor, heat rates, fuel costs, plant availability, outage rates and operational dates for new units.
- Automatic rate adjustments include fuel adjustment clauses, demand-side management compensatory mechanisms, rate of return and revenue adjustment mechanisms.

Sliding Scale Plans First PBR Mechanisms

- The oldest form of incentive mechanisms is the "sliding scale" plan.
- Adjustments based on a sliding- scale were designed to reward a utility for its improvements in efficiency as measured by reductions in the price of the service to the customer.
- The rate of return was adjusted in proportion to price changes. As price became lower, the allowed rate of return increased.

Sliding Scale Plans- - History

- Originated in Great Britain as part of the Sheffield Gas Act in 1855.
- First introduced in U.S. in Massachusetts in 1906
- Missouri authorized sliding scale regulation as part of its regulatory statutes in 1913 with the creation of the Missouri Public Service Commission.

Problems of Sliding Scale Plans

- Inflation
  - If cost of service legitimately rose, there was no mechanism to segregate and adjust for increases beyond the control of the utility.
- Rigid rates of return prescribed as part of the formula
  - Changes in capital costs were not reflected in formulas.
- Gains or losses experienced by the utility which were beyond management control

History of Incentive Based Regulation

- Traditional Rate Base/Rate of Return Regulation
  - Used for Years for Regulating Electric, Telephone, Natural Gas and Water & Sewer Industries
  - Traditional General Rate Case
  - Revenue Requirement= Rate Base x Reasonable Rate of Return + Reasonable Expenses, Including Taxes and Depreciation Expenses

Traditional Rate of Return Regulation

- Advantages
  - Encourages infrastructure development
  - Encourages development in all areas
  - Stable revenue stream
  - Stable rates

Traditional Rate of Return Regulation

- Disadvantages
  - Encourages inefficiency, gold plating
  - May not emphasize quality of service
  - May not emphasize customer relations
  - May not encourage planning

Traditional Rate of Return Regulation

- Regulatory Lag (Delay in Processing Case) produced incentives to reduce costs between changes in rates
- May produce incentives to invest in capital since total return was dependent upon amount of capital invested
- Long Term Cost Reduction Programs were discouraged since all cost savings were eventually reflected in rates

Traditional Rate Case Incentives

- Some public utilities were reluctant to improve their existing services by investing in new technology when the rate of return was limited.
- Some public utilities were reluctant to upgrade their existing plant when it was not fully depreciated.
- Some public utilities focused on short term investments and cost reduction programs rather than cost-effective long term programs

NARUC Resolution In Support of Incentives for Electric Utility Least- Cost Planning

In 1989, the National Association of Utility Regulatory Commissioners' Committee on Energy Conservation adopted a resolution encouraging the development of incentives for demand-side management programs, least-cost planning, and improvements in cost-effective, end-use efficiency programs.

NARUC Resolution

Underlying philosophy of resolution:

- Least Cost Plan for utility should also be its most profitable plan.
- Business strategy of electric utilities includes:
  - Advancing efficiency of electricity end-use
  - Managing electric demand.

NARUC Resolution

- Traditional Ratemaking formulas used by most state commissions cause reduction in utility earnings and discourage utilities from helping their customers to improve end-use efficiency.
- Such reduced earnings to utilities from relying on demand-side resources is a serious impediment of least-cost planning and achievement of a more energy-efficient society.

NARUC Resolution

- Improvement in the energy efficiency of our society would also result in lower utility bills, reduced carbon dioxide emissions, reduced acid rain, reduced oil imports and a lower trade deficit.
- Resolution concluded that ratemaking practices should give utilities incentives to perform least-cost planning.

NARUC Resolution

- Regulators should consider the loss of earnings potential connected with the use of demand-side resources;
- Adopt appropriate ratemaking mechanisms to encourage utilities to help their customers improve end-use efficiency cost-effectively;
- Ensure the successful implementation of least cost plans in a profitable way.

Bill Caps and Decoupling

- Periodic changes in rates Un-linking Revenue from Sales Volumes
- May include or exclude a fuel or power supply recovery mechanism
- Example: California Electric Revenue Adjustment Mechanism (ERAM)
- Incentive is to reduce the cost of providing service, including fuel switching and energy efficiency investments.

Fuel Efficiency Incentives

- Fuel Cost Recovery Mechanism which does NOT provide dollar-for-dollar recovery
- Heat rate and/or fuel cost elements
- Example: Hawaii fuel oil recovery
  - Fixed BTU rate set in rate case
  - Percentage pass-through of fuel price variation
- Incentive is to maximize fuel efficiency and minimize fuel cost.

Fuel Efficiency Incentive: How it Works

- If utility improves average heat rate, it still collects revenue associated with projected heat rate.
- If high-efficiency power plants cannot or do not operate, utility receives only the fuel costs required for the projected heat rate.
- Variations in fuel cost per unit of fuel are passed through to customers

Portfolio Incentives: Influencing the Resource Mix

- Programs to cause utilities to prefer one type of electric generating resource over another
  - Higher rate of return or more certain cost recovery
  - Mandatory use of specified resources
- Example: Washington Bonus Rate of Return
- Incentive is to prefer specific resources -- sometimes regardless of total cost to consumers.

DSM Incentives: Increasing the Reliance on End-Use Efficiency

- Programs to cause utilities to invest in energy-efficiency measures at customer premises
  - Higher rate of return or more certain cost recovery
  - Shared savings mechanisms
- Example: Puget Sound Energy 1991 DSM Incentive Program
  - Utility received 50% of the net cost savings
- Incentive is to invest in Cost-Effective DSM

Service Quality Indices

- Establishment of Minimum Standards of Performance for the Quality of Service
  - Reliability: outage frequency and duration
  - Customer complaints and responsiveness
  - Consumer and Worker Safety
- Example: Puget Sound Energy Merger Plan
- Incentive: Maintain Service Quality as part of other incentive programs to control costs.

Rate Case Moratoriums

- For a fixed period of time, the Regulatory Agency and the Public Utility agree that there will be no increases or decreases in the rates.
- Typically, 2 - 4 years in length.
- Protects consumers from increasing rates during periods of high investment in new plant.
- Gives Public Utility greater incentive to reduce costs during moratorium period.

Rate Case Moratoriums

- In some states, "acquisition premiums" (amount above net book value) in Merger Cases are not permitted to be reflected in consumer rates.

Rate Case Moratoriums permit Public Utility an opportunity to recover a portion of the "acquisition premium" that was paid to acquired utility's stockholders without directly reflecting the "acquisition premium" in consumers rates.

Price Caps

- Ceilings or "caps" are placed upon the price of services, but there may be adjustments for inflation and productivity.
- Pricing flexibility (rate reductions) are permitted below the cap at utility's option.
- Prices are permitted to rise with inflation.
- Consumer Price Index or utility-related price index used to reflect changes due to inflation.

Price Caps

Exogenous Factors beyond the control of the public utility are also reflected in rates

- Regulatory requirements
- Tax law changes
- Other agreed upon changes to cost of service

Price Caps

- Productivity Factors also reflected in rates
- Productivity improvements usually offset increases in inflation
- Typically, Total Factor Productivity studies are used to show improvements in productivity.

Price Caps

Advantages:

- Encourages lowering cost/unit
- Encourages customer relations
- Encourages planning

Price Caps

Disadvantages

- Discourages investment in high cost and/or low demand areas, i.e. long payback
- Discourages social subsidies, i.e. low income programs
- Quality of service may reduced, unless other safeguards are in effect

Price Caps

Practical Considerations

- How to set the initial price (i.e. starting point)
- What is the appropriate price index
- How to design the various baskets of service and put the proper costs into them
- What factors should be adjusted for that are outside the control of the public utility
- How often to update the plan

Profit Sharing Plans

- Under Profit-Sharing Plans, profits above a specified level are shared between consumers and company
- May have a dead-band in which company retains all cost savings
- May have a sharing-band in which company and consumer shares cost savings
- May have a cap above which all cost savings is returned to consumer, without a rate complaint

Questions, Comments, Observations?