

Ren Orans

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ENERGY AND ENVIRONMENTAL ECONOMICS, INC. *Managing Partner*

San Francisco, CA
1993 – Present

Dr. Orans founded this consulting firm in 1993. The firm has nationally recognized experts in the fields of transmission and distribution planning, economic and regulatory theory and finance. Dr. Orans heads the litigation support and utility planning practices for E3.

DEPARTMENT OF ENERGY NATIONAL RENEWABLE ENERGY LABORATORY ELECTRIC POWER RESEARCH INSTITUTE *Lead Consultant*

Washington, DC
1992 – 1993

Developed new models to evaluate small-scale generation and DSM placed optimally in utility transmission and distribution systems.

PACIFIC GAS & ELECTRIC COMPANY *Research and Development Department*

San Francisco, CA
1989 – 1991

Dr. Orans developed an economic evaluation method for distributed generation alternatives. The new approach shows that targeted, circuit-specific, localized generation packages or targeted DSM can in some cases be less costly than larger generation alternatives. He also developed the evaluation methodology that led to PG&E's installation of a 500kW photovoltaic (PV) facility at their Kerman substation. This is the only PV plant ever designed to defer the need for distribution capacity.

ELECTRIC POWER RESEARCH INSTITUTE

Palo Alto, CA
1988 – 1992

Developed the first formal economic model capable of integrating DSM into a transmission and distribution plan; the case study plan was used by PG&E for a \$16 million pilot project that was featured on national television.

DEPARTMENT OF ENERGY

Washington, DC
1989 – 1990

Lead consultant on a cooperative research and development project with the People's Republic of China. The final product was a book on lessons learned from electric utility costing and planning in the United States.

PACIFIC GAS & ELECTRIC COMPANY *Corporate Planning Department*

San Francisco, CA
1989 – 1992

Lead consultant on a joint EPRI and PG&E research project to develop geographic differences in PG&E's cost-of-service for use in the evaluation of capital projects. Developed shared savings DSM incentive mechanisms for utilities in California.

PACIFIC GAS & ELECTRIC COMPANY
Rate Department Economist

San Francisco, CA
1981 – 1985

As an economist at PG&E, he was responsible for the technical quality of testimony for all electric rate design filings. He was also responsible for research on customers' behavioral response to conservation and load management programs. The research led to the design and implementation of the first and largest residential time-of-use program in California and a variety of innovative pricing and DSM programs.

Education

STANFORD UNIVERSITY
Ph.D. in Civil Engineering

Palo Alto, CA

STANFORD UNIVERSITY
M.S. in Civil Engineering

Palo Alto, CA

UNIVERSITY OF CALIFORNIA
B.A. in Economics

Berkeley, CA

Refereed Papers

1. R. Orans, F. Pearl, A. Mahone (2010), "A Modest Proposal: After Cap and Trade", *Brookings Institute*
2. Olson A., R. Orans, D. Allen, J. Moore, and C.K. Woo (2009) "Renewable Portfolio Standards, Greenhouse Gas Reduction, and Long-line Transmission Investments in the WECC," *Electricity Journal*.
3. Orans, R., M. King, C.K. Woo and W. Morrow (2009) "Inclining for the Climate: GHG Reduction via Residential Electricity Ratemaking," *Public Utilities Fortnightly*, 147:5, 40-45.
4. Woo, C.K., E. Kollman, R. Orans, S. Price and B. Horii (2008) "Now that California Has AMI, What Can the State Do with It?" *Energy Policy*, 36, 1366-74.
5. Orans, R., S. Price, J. Williams, C.K. Woo and J. Moore (2007) "A Northern California - British Columbia Partnership for Renewable Energy" *Energy Policy*, 35:8, 3979-3983.
6. Lusztig, C., P. Feldberg, R. Orans and A. Olson (2006) "A Survey of Transmission Tariffs in North America," *Energy-The International Journal*, 31, 1017-1039.
7. Woo, C.K., A. Olson and R. Orans (2004), "Benchmarking the Price Reasonableness of an Electricity Tolling Agreement," *Electricity Journal*, 17:5, 65-75.
8. Orans, R., Woo, C.K., Clayton, W. (2004) "Benchmarking the Price Reasonableness of a Long-Term Electricity Contract," *Energy Law Journal*, 25: 2, 357-383.
9. Orans, R., Olson, A., Opatmy, C., (2003) "Market Power Mitigation and Energy Limited Resources," *Electricity Journal*, 16:2, 20-31.

10. Woo, C.K., D. Lloyd-Zannetti, R. Orans, B. Horii and G. Heffner (1995) "Marginal Capacity Costs of Electricity Distribution and Demand for Distributed Generation," *The Energy Journal*, 16:2, 111-130.
11. Chow, R.F., Horii, B., Orans, R. et. al. (1995), *Local Integrated Resource Planning of a Large Load Supply System*, Canadian Electrical Association.
12. Feinstein, C., Orans, R. (1995) "The Distributed Utility Concept," *The Annual Energy Review*, 1988.
13. Woo, C.K., R. Orans, B. Horii and P. Chow (1995), "Pareto-Superior Time-of-Use Rate Options for Industrial Firms," *Economics Letters*, 49, 267-272.
14. Woo, C.K., B. Hobbs, Orans, R. Pupp and B. Horii (1994), "Emission Costs, Customer Bypass and Efficient Pricing of Electricity," *Energy Journal*, 15:3, 43-54.
15. Orans, R., C.K. Woo, R. Pupp and I. Horowitz (1994), "Demand Side Management and Electric Power Exchange," *Resource and Energy Economics*, 16, 243-254.
16. Pupp, R., C.K. Woo, R. Orans, B. Horii, and G. Heffner (1995), "Load Research and Integrated Local T&D Planning," *Energy - The International Journal*, 20:2, 89-94.
17. Woo, C.K., R. Orans, B. Horii, R. Pupp and G. Heffner (1994), "Area- and Time-Specific Marginal Capacity Costs of Electricity Distribution," *Energy - The International Journal*, 19:12, 1213-1218.
18. Orans, R., C.K. Woo and B. Horii (1994), "Targeting Demand Side Management for Electricity Transmission and Distribution Benefits," *Managerial and Decision Economics*, 15, 169-175.
19. Orans, R., C.K. Woo and R.L. Pupp (1994), "Demand Side Management and Electric Power Exchange," *Energy - The International Journal*, 19:1, 63-66.
20. Orans, R., Seeto, D., and Fairchild, W., (1985), *The Evolution of TOU Rates*, Pergamon Press.

Research Reports

1. R. Orans, Woo, C.K., Lakshmi Alagappan, M. Madrigal, *Creating Renewable Energy Ready Transmission Networks*, World Bank, September, 2010
2. CPUC Staff, Olson, A., Orans, R., *33% Renewables Portfolio Standard Implementation Analysis Preliminary Results*, California, June, 2009.
3. Orans, R., Olson, A, *Load-Resource Balance in the Western Interconnection: Towards 2020*, Western Electricity Industry Leaders Group, September, 2008.
4. Orans, R., Olson, A., *Integrated Resource Plan for Lower Valley Energy*, December, 2004.

5. Orans, R., Woo C.K., and Olsen, Arne, *Stepped Rates Report*, prepared for BC Hydro and filed with the BCUC, May, 2003.
6. Orans, R., Woo, C.K., and B. Horii (1995), *Impact of Market Structure and Pricing Options on Customers' Bills*, Report submitted to B.C. Hydro.
7. Horii, B., Orans, R., Woo, C.K., (1994) *Marginal Cost Disaggregation Study*, Report submitted to PSI Energy.
8. Woo, C.K., L. Woo and R. Orans (1995), *Rationing and Area-Specific Generation Costs*, Report submitted to Pacific Gas and Electric Company.
9. Orans, R., Woo, C.K., and C. Greenwell (1994), *Designing Profitable Rate Options Using Area- and Time-Specific Costs*, Report No. TR-104375, Electric Power Research Institute.
10. Singer, J., Orans, R., *Energy Efficiency Lending, A Business Opportunity for Fannie Mae*, Report submitted to Fannie Mae.
11. Orans, R., Feinstein, C. et. al., (1993), *Distributed Utility Valuation Study*, submitted to the Electric Power Research Institute, the National Renewable Energy Laboratory, and PG&E.
12. Orans, R., Pupp, R., (1993), *Menomonee Falls Case Study*, Submitted to Wisconsin Electric Power Corporation.
13. Orans, R. and C.K. Woo (1992), *Marginal Cost Disaggregation Study*, Report submitted to Wisconsin Electric Power Corporation.
14. Orans, R., C.K. Woo, J.N. Swisher, B. Wiersma and B. Horii (1992), *Targeting DSM for Transmission and Distribution Benefits: A Case Study of PG&E's Delta District*, Report No. TR-100487, Electric Power Research Institute.
15. Orans, R., Swisher, J., Duane, T., (1989), *Lessons Learned from U.S. Electric Utilities*, Prepared for the Department of Energy for the Peoples Republic of China.
16. Orans, R., *Area-Specific Marginal Costing for Electric Utilities: A Case Study of Transmission and Distribution Costs* (1989) PhD Thesis, Stanford University.
17. Orans, R., (1987) *The Risk of Sales Forecasts: Controllable through Indexation and Careful Disaggregation*, Submitted to Stanford University and Pacific Gas and Electric Company.
18. C.K. Woo, and R. Orans (1983), *Transferability of Other Utilities' Time of Use Experiments to PG&E's Service Schedule D-7*, Pacific Gas and Electric Company Reports filed with the California Public Utilities Commission.

Conference Papers

1. Orans, R., "Renewable Resource Opportunities in the West," *Law Seminars International*, British Columbia, August 2010.

2. Orans, R., "California's 33% RPS Implementation Plan," *Law Seminars International*, San Francisco, September, 2009.
3. Orans, R., "Comparable Treatment of Resource Options," *FERC Technical Conference*, Phoenix, AZ., September, 2009.
4. Orans, R., "A GHG Compliant World in 2050," *Law Seminars International*, San Francisco, September, 2008.
5. Orans, R., "Gaps in State Energy Policy Coordination, A View from the Cheap Seats" *Napa California, CFEE*, September, 2007.
6. Orans, R. *Evaluating Generating Resources based on a Equivalent Reliability Methodology*, 2nd Annual Resource Planning Symposium, January, 2004, Vancouver, Canada.
7. Martin, J., Orans, R., Knapp, K., "DG Economics and Distribution Rate Design" (2000), *Western Electric Power Institute, Distributed Generation and the Utility Distribution System Conference*, March 22-23, Reno, NV.
8. Orans, R. (1997), "Getting the Transmission Prices Right," *Facilitating Cross Border Trade*, New Mexico.
9. Orans, R. (1997), "Deregulation on the Mainland, What is Happening and What is Not," *PCEA Conference*, Hawaii.
10. Swisher, J., Orans, R., (1995), "A New Utility DSM Strategy Using Intensive Campaigns Based on Area Specific Costs," *ECEEE 1995 Summer Study*.
11. Orans, R., Greenwell, C., (1995), "Designing Profitable Rate Options Using Area and Time-Specific Costs," *Prepared for EPRI, Annual DSM Review*, Dallas, Texas.
12. Orans, R., *Integrated Local Area Planning*, (1995), *Prepared for NELPA and presented in Calgary*.
13. Orans, R., *Local Area Planning for Profit*, "Annual Review of Distributed Resource Studies," *Prepared for EPRI*, Lake George, New York.
14. Orans, R., C.K. Woo, B. Horii and R. Pupp, (1994), "Estimation and Applications of Area- and Time-Specific Marginal Capacity Costs," *Proceedings: 1994 Innovative Electricity Pricing*, (February 9-11, Tampa, Florida) *Electric Research Power Institute*, Report TR-103629, 306-315.