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ENERGY AND ENVIRONMENTAL ECONOMICS, INC.
Senior Partner

San Francisco, CA
1993 – Present

Mr. Horii is one of the founding partners of Energy and Environmental Economics, Inc. (E3). He is a lead in the practice areas of Resource Planning; Energy Efficiency and Demand Response; Cost of Service and Rate Design; and acts as a lead in quantitative methods for the firm. Mr. Horii also works in the Energy and Climate Policy, Distributed Energy Resources, and regulatory support practice areas. He has testified and prepared expert testimony for use in regulatory proceedings in California, South Carolina, Texas, Vermont, British Columbia, and Ontario, Canada. He designed and implemented numerous computer models used in regulatory proceedings, litigation, utility planning, utility requests for resource additions, and utility operations. His clients include BC Hydro, California Energy Commission, California Public Utilities Commission, Consolidated Edison, El Paso Electric Company, Hawaiian Electric Company, Hydro Quebec, Minnesota Department of Commerce, NYSERDA, Orange and Rockland, PG&E, Sempra, Southern California Edison, and South Carolina Office of Regulatory Staff.

Resource Planning:

- Authored the Locational Net Benefits Analysis (LNBA) tool used by California IOUs to evaluate the total system and local benefit of distributed energy resources by detailed distribution subareas
- Created the software used by BC Hydro to evaluate individual bids and portfolios tendered in calls for supplying power to Vancouver Island, demand response from large customers, and new clean power generation
- Designed the hourly generation dispatch and spinning reserve model used by El Paso Electric to simulate plant operations and determine value-sharing payments
- Evaluated the sale value of hydroelectric assets in the Western U.S.
- Simulated bilateral trading decisions in an open access market; analyzed market segments for micro generation options under unbundled rate scenarios; forecasted stranded asset risk and recovery for North American utilities; and created unbundled rate forecasts
- Reviewed and revised local area load forecasting methods for PG&E, Puget Sound Energy, and Orange and Rockland Utilities

Energy Efficiency, Demand Response, and Distributed Resources:

- Author of the “E3 Calculator” tool used as the basis for all energy efficiency programs evaluations in California since 2006
- Independent evaluator for the development of locational avoided costs by the Minnesota electric utilities
- Consulted on the development of the NEM 2.0 Calculator for the CPUC Energy Division that was used by stakeholders in the proceeding as the common analytical framework for party positions; also authored the model’s sections on revenue allocation that forecast customer class rate changes over time, subject to changes in class service costs

- Co-author of the avoided cost methodology adopted by the California CPUC for use in distributed energy resource programs since 2005
- Principal consultant for the California Energy Commission's Title 24 building standards to reflect the time and area specific value of energy usage reductions and customer-sited photovoltaics and storage
- Principal investigator for the 1992 EPRI report *Targeting DSM for Transmission and Distribution Benefits: A Case Study of PG&E's Delta District*, one of the first reports to focus on demand-side alternatives to traditional wires expansion projects
- Provided testimony to the CPUC on the demand response cost effectiveness framework on behalf of a thermal energy storage corporation

Cost of Service and Rate Design:

- Designed standard and innovative electric utility rate options for utilities in the U.S., Canada, and the Middle East
- Principal author of the *Full Value Tariff and Retail Rate Choices* report for NYSERDA and the New York Department of Public Staff as part of the New York REV proceeding
- Developed the rate design models used by BC Hydro and the BCUC for rate design proceedings since 2008
- Principal author on marginal costing, ratemaking trends and rate forecasting for the California Energy Commission's investigation into the revision of building performance standards to effect improvements in resource consumption and investment decisions
- Consulted to the New York State Public Service Commission on appropriate marginal cost methodologies (including consideration of environmental and customer value of service) and appropriate cost tests
- Authored testimony for BC Hydro on Bulk Transmission Incremental Costs (1997); principal author of B.C. Hydro's System Incremental Cost Study 1994 Update (With Regional Results Appendix)
- Performed detailed market segmentation study for Ontario Hydro under both embedded and marginal costs
- Testified for the South Carolina Office of Regulatory Staff on SCANA marginal costs
- Taught courses on customer profitability analysis for the Electric Power Research Institute
- Other work has addressed marginal cost-based revenue allocation and rate design; estimating area and time specific marginal costs; incorporating customer outage costs into planning; and designing a comprehensive billing and information management system for a major energy services provider operating in California

Transmission Planning and Pricing:

- Designed a hydroelectric water management and renewable integration model used to evaluate the need for transmission expansion in California's Central Valley
- Developed the quantitative modeling of net benefits to the California grid of SDG&E's Sunrise Powerlink project in support of the CAISO's testimonies in that proceeding
- Testified on behalf of the Vermont Department of Public Service on the need for transmission capacity expansion by VELCO
- Determined the impact of net vs. gross billing for transmission services on transmission congestion in Ontario and the revenue impact for Ontario Power Generation

- Authored numerous Local Integrated Resource Planning studies for North American utilities that examine the cost effectiveness of distributed resource alternatives to traditional transmission and distribution expansions and upgrades
- Developed the cost basis for BC Hydro's wholesale transmission tariffs
- Provided support for numerous utility regulatory filings, including testimony writing and other litigation services

Energy and Climate Policy:

- Author of the E3 "GHG Calculator" tool used by the CPUC and California Energy Commission for evaluating electricity sector greenhouse gas emissions and trade-offs
- Primary architect of long-term planning models evaluating the cost and efficiency of carbon reduction strategies and technologies
- Testified before the British Columbia Public Utilities Commission on electric market restructuring

PACIFIC GAS & ELECTRIC COMPANY

San Francisco, CA

Project Manager, Supervisor of Electric Rates

1987-1993

- Managed and provided technical support to PG&E's investigation into the Distributed Utilities (DU) concept; projects included an assessment of the potential for DU devices at PG&E, an analysis of the loading patterns on PG&E's 3000 feeders, and formulation of the modeling issues surrounding the integration of Generation, Transmission, and Distribution planning models
- As PG&E's expert witness on revenue allocation and rate design before the California Public Utilities Commission (CPUC), was instrumental in getting PG&E's area-specific loads and costs adopted by the CPUC and extending their application to cost effectiveness analyses of DSM programs
- Created interactive negotiation analysis programs and forecasted electric rate trends for short-term planning

INDEPENDENT CONSULTING

San Francisco, CA

Consultant

1989-1993

- Helped develop methodology for evaluating the cost-effectiveness of decentralized generation systems for relieving local distribution constraints; created a model for determining the least-cost expansion of local transmission and distribution facilities integrated with area-specific DSM incentive programs
- Co-authored *The Delta Report* for PG&E and EPRI, which examined the targeting of DSM measures to defer the expansion of local distribution facilities

Education

Stanford University

Palo Alto, CA

M.S., Civil Engineering and Environmental Planning

1987

Citizenship

United States

Refereed Papers

1. Woo, C.K., I. Horowitz, B. Horii, R. Orans, and J. Zarnikau (2012) "Blowing in the wind: Vanishing payoffs of a tolling agreement for natural-gas-fired generation of electricity in Texas," *The Energy Journal*, 33:1, 207-229.
2. Orans, R., C.K. Woo, B. Horii, M. Chait and A. DeBenedictis (2010) "Electricity Pricing for Conservation and Load Shifting," *Electricity Journal*, 23:3, 7-14.
3. Moore, J., C.K. Woo, B. Horii, S. Price and A. Olson (2010) "Estimating the Option Value of a Non-firm Electricity Tariff," *Energy*, 35, 1609-1614.
4. Woo, C.K., B. Horii, M. Chait and I. Horowitz (2008) "Should a Lower Discount Rate be Used for Evaluating a Tolling Agreement than Used for a Renewable Energy Contract?" *Electricity Journal*, 21:9, 35-40.
5. 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.
6. Baskette, C., B. Horii, E Kollman, and S. Price (2006) "Avoided cost estimation and post reform funding allocation for California's energy efficiency programs," *Energy* 31, (2006) 1084-1099.
7. Woo, C.K., I. Horowitz, A. Olson, B. Horii and C. Baskette (2006) "Efficient Frontiers for Electricity Procurement by an LDC with Multiple Purchase Options," *OMEGA*, 34:1, 70-80.
8. Woo, C.K., I. Horowitz, B. Horii and R. Karimov (2004) "The Efficient Frontier for Spot and Forward Purchases: An Application to Electricity," *Journal of the Operational Research Society*, 55, 1130-1136.
9. Woo, C. K., B. Horii and I. Horowitz (2002) "The Hopkinson Tariff Alternative to TOU Rates in the Israel Electric Corporation," *Managerial and Decision Economics*, 23:9-19.
10. Heffner, G., C.K. Woo, B. Horii and D. Lloyd-Zannetti (1998) "Variations in Area- and Time-Specific Marginal Capacity Costs of Electricity Distribution," *IEEE Transactions on Power Systems*, PE-493-PWRS-012-1997, 13:2, 560-567.
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. Woo, C.K., R. Orans, B. Horii and P. Chow (1995) "Pareto-Superior Time-of-Use Rate Option for Industrial Firms," *Economics Letters*, 49, 267-272.
13. 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.

14. 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.
15. 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.
16. 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.
17. 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.

Research Reports and Filed Testimony

1. Horii B., C.K. Woo, E. Kollman and M. Chait (2009) *Smart Meter Implementation Business Case, Rate-related Capacity Conservation Estimates - Technical Appendices* submitted to B.C. Hydro.
2. Horii, B., P. Auclair, E. Cutter, and J. Moore (2006) *Local Integrated Resource Planning Study: PG&E's Windsor Area, Report prepared for PG&E.*
3. Horii, B., R. Orans, A. Olsen, S. Price and J Hirsch (2006) *Report on 2006 Update to Avoided Costs and E3 Calculator, Prepared for the California Public Utilities Commission.*
4. Horii, B., (2005) *Joint Utility Report Summarizing Workshops on Avoided Costs Inputs and the E3 Calculator, Primary author of testimony filed before the California Public Utilities Commission.*
5. Horii, B., R. Orans, and E. Cutter (2005) *HELCO Residential Rate Design Investigation, Report prepared for Hawaiian Electric and Light Company.*
6. Orans, R., C.K. Woo, and B. Horii (2004-2005) *PG&E Generation Marginal Costs, Direct and rebuttal testimonies submitted to the California Public Utilities Commission on behalf of PG&E.*
7. Orans, R., C.K. Woo, B. Horii, S. Price, A. Olson, C. Baskette, and J Swisher (2004) *Methodology and Forecast of Long Term Avoided Costs for the Evaluation of California Energy Efficiency Programs, Report prepared for the California Public Utilities Commission.*
8. Orans, R, B. Horii, A. Olson, M. Kin, (2004) *Electric Reliability Primer, Report prepared for B.C. Hydro and Power Authority.*
9. Horii, B., T. Chu (2004) *Long-Run Incremental Cost Update – 2006/2005, Report prepared for B.C. Hydro and Power Authority.*
10. Price, S., B. Horii (2001) *Chelsea and E. 13th Street / East River Evaluation, Local integrated resource planning study prepared for Consolidated Edison Company of New York.*
11. Horii, B., C.K. Woo, and S. Price (2001) *Local Integrated Resource Planning Study for the North of San Mateo Study Area, Report prepared for PG&E.*
12. Horii, B., C.K. Woo and D. Engel (2000) *PY2001 Public Purpose Program Strategy and Filing Assistance: (a) A New Methodology for Cost-Effectiveness Evaluation; (b) Peak Benefit Evaluation; (c) Screening Methodology for Customer Energy Management Programs; and (d) Should California Ratepayers Fund Programs that Promote Consumer Purchases of Cost-Effective Energy Efficient Goods and Services? Reports submitted to Pacific Gas and Electric Company.*

13. Horii, B. (2000) *Small Area Forecasting Process and Documentation*, Report prepared for Puget Sound Energy Company.
14. Price S., B. Horii, and K. Knapp (2000) *Rainey to East 75th Project – Distributed Resource Screening Study*, Report prepared for Consolidated Edison Company of New York.
15. Mahone, D., J. McHugh, B. Horii, S. Price, C. Eley, and B. Wilcox (1999) *Dollar-Based Performance Standards for Building Energy Efficiency*, Report submitted to PG&E for the California Energy Commission.
16. Horii, B., J. Martin (1999) *Report to the Alaska Legislature on Restructuring*, E3 prepared the forecasts of market prices and stakeholder impacts used in this CH2M Hill report.
17. Horii, B., S. Price, G. Ball, R. Dugan (1999) *Local Integrated Resource Planning Study for PG&E's Tri-Valley Area*, Report prepared for PG&E.
18. Woo, C.K. and B. Horii (1999) *Should Israel Electric Corporation (IEC) Replace Its Industrial Time of Use Energy Rates with A Hopkinson Tariff?* Report prepared for IEC.
19. B. Horii, J. Martin, Khoa Hoang, (1996), *Capacity Costing Spreadsheet: Application of Incremental Costs to Local Investment Plans*, Report and software forthcoming from the Electric Power Research Institute.
20. Lloyd-Zanetti, D., B. Horii, J. Martin, S. Price, and C.K. Woo (1996), *Profitability Primer: A Guide to Profitability Analysis in the Electric Power Industry*, Report No. TR-106569, Electric Power Research Institute.
21. Horii B., (1996) *Customer Reclassification Study*, Report Submitted to Ontario Hydro.
22. Horii, B., Orans, R., Woo, C.K., (1995) *Area- and Time- Specific Marginal Cost and Targeted DSM Study*, Report submitted to PSI Energy.
23. Horii, B., Orans, R., Woo, C.K., (1995) *Local Integrated Resource Planning Study - White Rock*, Report submitted to B.C. Hydro.
24. Horii, B., Orans, R., Woo, C.K., (1995) *Area- and Time- Specific Marginal Cost Study*, Report submitted to B.C. Hydro.
25. Orans, R., C.K. Woo and B. Horii (1995), *Impact of Market Structure and Pricing Options on Customers' Bills*, Report submitted to B.C. Hydro.
26. Horii, B., R. Orans (1995), *System Incremental Cost Study 1994 Update (With Regional Results Appendix)*, Report submitted to B.C. Hydro.
27. Horii, B., Orans, R., Woo, C.K., (1994) *Marginal Cost Disaggregation Study*, Report submitted to PSI Energy.
28. 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.
29. Horii, B., (1991) *Pacific Gas and Electric Company 1993 General Rate Case Application (eight exhibits within Phase I, and contributions to five exhibits within Phase II)*, A. 91-11-036, Submitted to the California Public Utilities Commission.

30. Horii, B., (1991) *Pacific Gas and Electric Company 1991 Electricity Cost Adjustment Clause Application (Revenue Allocation and Rate Design)*, Submitted to the California Public Utilities Commission.

Conference Papers

1. Heffner, G., C.K. Woo, B. Horii and D. Lloyd-Zannetti (1998) "Variations in Area- and Time-Specific Marginal Capacity Costs of Electricity Distribution," *IEEE Transactions on Power Systems*, PE-493-PWRS-012-1997, 13:2, 560-567.
2. Horii, B., (1995), "Final Results for the NMPC Area Costing and Distributed Resource Study," *Proceedings Distributed Resources 1995: EPRI's First Annual Distributed Resources Conference*, Electric Research Power Institute, August 29-31, 1995, Kansas City, Missouri
3. 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.
4. Heffner, G., R. Orans, C.K. Woo, B. Horii and R. Pupp (1993), "Estimating Area Load and DSM Impact by Customer Class and End-Use," *Western Load Research Association Conference*, September 22-24, San Diego, California; and *Electric Power Research Institute CEED Conference*, October 27-29, St. Louis, Missouri.