

RESUME

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SUMMARY

More than 35 years of experience in energy and environmental systems research, design, demonstration, analysis and engineering and project management. Registered professional mechanical engineer in the State of Hawaii for more than 28 years. Project manager for dozens of projects in the areas of renewable and conventional energy, energy efficiency and conservation, electric and hybrid vehicles, alternative fuels, energy and engineering education, and environmental engineering. Many of these projects were performed under severe time and funding constraints and required the close coordination of a number of individuals and tasks. Many of these projects also involved research, development, demonstration, and commercialization of new and relatively untested technologies, systems, and concepts.

PROFESSIONAL DATA

Education: Ph.D. 1991. Ocean Engineering. University of Hawaii at Manoa.
Dissertation Title: "Development of a Solar Pond System Design
Computer Model"

M.S. 1980. Mechanical Engineering. University of Hawaii at Manoa.
Thesis Title: "Application of Heat Pumps to Residential Water Heating"

B.S. 1976. Environmental Technology and Urban Systems. Florida
International University

1973 U. S. Navy Nuclear Power School and Nuclear Power Plant
Prototype (Nuclear Engineering)

1972 Ensign. U. S. Navy Officer Candidate School

B.S. 1972. Chemistry (with distinction). University of Minnesota

Language(s): English - write, speak and read; German - read
Professional

Registration: Mechanical Engineer, State of Hawaii, No. 5485 (1983)

Research and Work Experience:

- 1993 - Present **OWNER / PRINCIPAL CONSULTANT.** Rezachek & Associates. Energy and environmental engineering consultants. Provide consulting and project management services in a variety of renewable energy, energy efficiency, and environmental areas.
- 2003 - 2009 **ASSOCIATE DEVELOPMENT DIRECTOR / CONSULTANT.** Consultant to Honolulu Seawater Air Conditioning, LLC (HSWAC). Provided engineering consulting and project management services in all phases of development of the downtown Honolulu Seawater Air Conditioning (SWAC) District Cooling Project.
- 1987 - 2003 **ALTERNATE ENERGY SPECIALIST.** State of Hawaii - Department of Business, Economic Development and Tourism - Energy Division - Alternate Energy Branch. Conduct analyses of existing and proposed alternate energy programs and projects. Conduct the planning, development and implementation of alternate energy demonstration and commercialization projects. Project manager for more than fifty alternate energy- and energy-efficiency-related projects.
- 1980 - 1987 **ASSISTANT MECHANICAL ENGINEER.** Sugar Technology and Engineering Department, Hawaiian Sugar Planters' Association (HSPA). Alternate and conventional energy research and application, energy conservation and air pollution monitoring. Supervised two experimentalists for approximately 30 percent of their time.
- 1980 **GRADUATE RESEARCH ASSISTANT.** Hawaii Natural Energy Institute (HNEI), University of Hawaii at Manoa. Assisted in all phases of alternate energy research projects.
- 1979 - 1980 **JUNIOR RESEARCHER.** Hawaii Natural Energy Institute (HNEI), University of Hawaii at Manoa. Hawaii Ethanol from Molasses Project. Literature search team leader. Cost and energy analyses and preliminary process evaluation.
- 1978 - 1979 **GRADUATE RESEARCH ASSISTANT.** Center for Engineering Research (CER), University of Hawaii at Manoa. Various support services related to alternate energy and engineering research.
- 1976 - 1977 **GRADUATE RESEARCH ASSISTANT.** Department of Oceanography, University of Hawaii at Manoa. Research on the "Dissolution of Calcareous Nanoplankton Under Simulated Oceanic Conditions."

Determined the dissolution rate of calcium-45 tagged coccoliths under ocean pressure and carbonate (pH) concentrations.

- 1974 - 1976 **ASSOCIATE QUALITY ASSURANCE ENGINEER.** Quality Assurance Department, Design Group, Florida Power & Light Company, Miami, Florida. Responsible for the quality assurance aspects of engineering activities performed throughout the life of a nuclear power plant. Audit team leader for numerous quality assurance audits of groups and departments associated with nuclear and environmental engineering.
- 1974 **PROJECT ENGINEER.** Advanced Reactors Division, Westinghouse Electric Corporation, Madison, Pennsylvania. Coordinated projects in Liquid Metal Fast Breeder Reactor (LMFBR) development with other Westinghouse and Nuclear Regulatory Commission (NRC) projects.
- 1972 - 1974 **STUDENT/OFFICER.** United States Navy Nuclear Power Program. Officer training; nuclear engineering education; and operation of, and supervision of enlisted operators of, a nuclear power plant prototype.

PROFESSIONAL AND ORGANIZATION AFFILIATIONS

- Professional Mechanical Engineer, State of Hawaii, No. 5485 (1983)
- Affiliate Grad Faculty, Department of Ocean and Resources Engineering, SOEST, University of Hawaii at Manoa
- Member, American Society of Heating, Refrigerating, and Air Conditioning Engineers (ASHRAE)
- Member, American Society of Mechanical Engineers (ASME)
- Member, American Solar Energy Society (ASES)
- Member, American Wind Energy Association (AWEA)
- Member, International Solar Energy Society (ISES)
- Member, Life of the Land (Hawaii)
- Member, Union of Concerned Scientists (UCS)

ENGINEERING CONSULTING CLIENT SERVICES

General

- Provide high quality consulting and engineering services.
- Create multi-disciplinary teams tailored to each assignment.
- Apply energy industry expertise in multiple areas.

Business Planning

- Help organizations explore opportunities in renewable and energy efficiency energy technologies and markets.
- Assist in business plan development and strategic planning.

Communications and Public Outreach

- Increase public awareness of renewable energy and energy efficiency technologies.
- Assist clients in promotion of, and education regarding, renewable energy and energy efficiency technologies, projects, and policies.

Due Diligence

- Assist in determining technical, economic, and environmental feasibility of developer-proposed projects.
- Identify and evaluate specific project equity investment opportunities.
- Provide expert witness testimony.
- Critique opposition testimony for cross-examination and impeachment.
- Conduct and coordinate due diligence reviews with project developers and investor advisors.

Economic Analyses

- Determine project capital and O&M costs.
- Conduct financial evaluation and feasibility analyses.
- Conduct Benefit/Cost analyses.
- Conduct Life Cycle Cost (LCC) analyses.
- Conduct Electric Power Research Institute Technical Assessment Guide (EPRI TAG) modeling.
- Conduct Economic Impact Analyses, including Input/Output analyses.
- Conduct learning curve analyses.
- Conduct cost and energy pathway analyses.
- Conduct sensitivity analyses to changes in various economic analysis and system performance parameters.

Education and Training

- Organize and execute energy-related seminars, conferences, symposia, and presentations.
- Develop presentation materials.
- Develop and provide on-line and on-site energy education seminars and courses.
- Develop and conduct renewable energy and energy efficiency technology training programs.

Energy Efficiency Services

- Conduct energy audits and assessments.
- Identify appropriate energy conservation measures.
- Perform building energy system integration and commissioning.

Energy Rating System Analyses and Implementation

- Provide LEED and Energy STAR consulting.
- Help customers obtain Energy STAR and LEED ratings.

Greenhouse Gas Inventories and Reduction

- Assist clients in quantifying emissions of greenhouse gases (GHG).
- Assist companies with estimating and reporting GHG emissions, energy consumption, and criteria pollutant emissions.
- Identify evolving policies related to climate change and how such policy changes might impact clients.
- Help develop practical strategies to address greenhouse gas emissions.
- Work with companies and governments to reduce their carbon footprints.
- Assist with emissions trading under federal legislation and state implementation plans.

Marketing Studies and Analyses

- Advise on current financing energy and technology market conditions.
- Identify market impediments and ways to overcome these impediments.
- Conduct market research.
- Develop and implement marketing strategies.
- Evaluate market implications of various technology development and policy options.

Miscellaneous Energy-Related Services

- Develop custom energy software applications.

Policy Development and Legislative Initiatives

- Conduct in-depth technical and policy assessments.
- Predict and analyze policy trends.
- Advise policymakers and program managers.
- Provide critical guidance on how to meet policy objectives.
- Establish and manage relationships with elected officials, regulators and community opinion leaders to support project development.
- Provide research, testimony, reports and regulatory support to consumer advocates, environmental organizations, regulatory commissions, state energy offices, and others.
- Work collaboratively with businesses, public interest groups, and other organizations to promote renewable energy and energy efficiency technology development and deployment.
- Provide lobbying support for policy development and legislative initiatives.
- Assist in negotiations, formulation of climate law policy, and project development in the areas of carbon transactions, renewable energy and greenhouse gas reform.
- Assist in developing legislation to limit greenhouse gas emissions, establish renewable portfolio standards, and promote energy efficiency.

Pollution Control

- Conduct air and water pollution analyses and recommend management strategies.
- Promote renewable energy and energy efficiency as pollution reduction strategies.

Project Financing

- Conduct financial analyses and modeling of renewable energy and energy efficiency project economics.
- Conduct utility avoided cost analyses.
- Identify specific investment opportunities, and identify strategic and institutional equity investors.
- Assist in identifying prospective commercial term debt financing sources.
- Assist in developing power and renewable energy credit purchase agreements.
- Identify and apply for selected public sector financing support programs.
- Help projects to take advantage of tax, and other financial, incentives including tax-exempt bonds, Clean Renewable Energy Bonds, clean energy investment tax credits, new market tax credits, and renewable energy production tax credits.
- Identify and analyze Renewable Energy Credit (REC) Trading Programs.
- Help create Green Tag Energy Credits and other green pricing options for the producers of renewable energy.

Project Siting, Environmental Impact Assessment, Permitting, and Approvals

- Establish and conduct renewable energy resource assessment programs to determine temporal and spatial availability.
- Assist in site selection and acquisition.
- Assist in securing land and water rights.
- Assist in Environmental Impact Assessment, Environmental Impact Analysis, and environmental compliance support.
- Identify and advise on environmental, health and safety requirements and pollution control strategies.
- Assist in identifying and obtaining all necessary permits and approvals from federal, state and local governments.
- Assist in obtaining public acceptance and support.
- Advise on implementation of government programs and assist clients in formulating environmental management systems and policies.
- Provide operational and environmental testing start-up assistance.

Regulatory

- Conduct regulatory compliance studies.
- Identify regulatory requirements and performance measures.
- Assist in regulatory policy planning.
- Assist with utility integrated resource plans.
- Develop renewable portfolio standard compliance plans.

Research and Development Support

- Help establish renewable energy and energy efficiency R&D objectives.
- Assist in planning and execution of renewable energy and energy efficiency R&D activities.
- Assist in technology transfer for promising new renewable energy and energy efficiency technologies.

Sustainable Design and Green Building Services

- Provide sustainable development program design and implementation assistance.
- Promote whole-building, integrated practices.
- Assist companies manage issues of corporate social responsibility and sustainability.
- Provide project management for sustainable design and green building development and demonstration projects.
- Assist companies report publicly on their environmental practices and the sustainability of their business model.

System Design, Construction, and Analyses

- Assess the potential for developing renewable energy and energy efficiency projects.
- Prepare feasibility reports to allow project developers to determine project viability (technical, economic, and environmental).
- Advise and assist owners, contractors, engineers and suppliers on the design and construction of renewable energy systems and energy efficient facilities.
- Advise and assist customers in the design, construction and financing of their own renewable energy and energy efficiency systems.
- Develop project technical requirements.
- Provide design assistance for various phases of each project (conceptual design, preliminary design, and final design).
- Conduct design review and planning.
- Assist in system layout and technology selection.
- Assist in bid and proposal evaluation and construction and equipment procurement.
- Assist in drafting and negotiating procurement, engineering and construction agreements and operations and maintenance (O&M) agreements.
- Provide project planning, development, and management services.
- Provide system startup, performance evaluation, and reporting services.
- Provide project operations support, including project commissioning.
- Conduct system reliability assessments.

Technology Assessments

- Conduct technology characterizations.
- Conduct comprehensive studies to evaluate renewable energy and energy efficiency technologies.
- Analyze and compare competing conventional and renewable energy and energy efficiency technologies.
- Help government agencies and private sector companies determine the technical viability of various technologies or systems.
- Recommend the most cost effective and appropriate technologies for a specific application.

Utility Integration and Interconnection

- Identify interconnection and transmission access requirements.
- Assist in conducting transmission and interconnection studies.
- Conduct energy storage and power quality studies.