

**EDUCATIONAL BACKGROUND AND PROFESSIONAL EXPERIENCE
OF
JOSEPH A. VUMBACO, P.E.**

Mr. Vumbaco graduated from Rose Polytechnic (now Rose-Hulman) Institute of Technology, Terre Haute, Indiana in 1969 with a degree in Bachelor of Science in Mechanical Engineering. In 1975 he received a Master's Degree in Business Administration with a concentration in finance from the Barney School of Business and Public Administration at the University of Hartford, Hartford, Connecticut. Over the course of his career he has received continuing education units and college credit in several electrical engineering, rate, and utility operations courses from the University of New Haven, New Haven, Connecticut; the University of Minnesota, Minneapolis, Minnesota; United Technologies, Inc.; and the American Public Power Association; National Society of Professional Engineer; and the Rocky Mountain Electric League. Additionally, Mr. Vumbaco has served on the Engineering and Science Curricula Task Force of the Commission on the Future for the Rose-Hulman Institute of Technology and on the Colorado Municipal League Task Force on Electric Competition and Franchise Matters.

Mr. Vumbaco is registered to practice as a Professional Engineer in the states of Colorado, Connecticut, Louisiana, Utah and Texas. He is a member of the National Society of Professional Engineers ("NSPE"), the Colorado Society of Professional Engineers ("CSPE"), the American Society of Mechanical Engineers ("ASME"), and the American Water Works Association ("AWWA"). Mr. Vumbaco is a practicing member of ASME's Power and Management Sciences Division, a member of NSPE's Private Practice Division, and former chairman of the CSPE's Private Practice Statewide Chapter and Metropolitan Chapter Executive Committee.

Since 1990, Mr. Vumbaco has been a shareholder and Managing Partner in the consulting firm of Legend Consulting Group Limited which provides consulting engineering, economic, financial and regulatory consulting services to the Council of the City of New Orleans in its regulation of Entergy New Orleans, Inc. and Entergy Louisiana, LLC.

From 1990 until 1996 Mr. Vumbaco also was President of SVBK Consulting Group, LLC a consulting firm with extensive national experience in providing engineering, engineering-economic, financial and management consulting services to financial institutions, large utility consumers, law firms, utilities and governmental and industrial entities who are involved in the ownership, operation, regulation, planning, financing, or the end use of electric, thermal energy, water, and natural gas utility services.

Since 1996, Mr. Vumbaco has been the Managing Partner of Energy & Resource Consulting Group, LLC ("ERG"), a consulting engineering firm with extensive national and international experience in providing engineering, engineering-economic, financial and management consulting services to financial institutions, large utility consumers, law firms, utilities and governmental and industrial entities who are involved in the ownership, operation, regulation, planning, financing,

or the end use of electric, thermal energy, water, and natural gas utility services. In his role as Managing Partner of ERG he has been actively engaged in the performance and development of feasibility analyses, negotiation, and implementation plans for utility acquisitions and sales. He has participated in, and directed the preparation of, financial feasibility analyses and reports, financing programs and feasibility studies associated with utility revenue bond and non-recourse project financing in the energy field; supply- and demand-side studies and reports; transmission access and supply contract negotiations; and the drafting of the necessary financing, supply side, joint ownership, and transmission agreements for projects in the utility industry. He has also been responsible for providing engineering assistance to several Fortune 500 industrial clients in the development of competitive RFPs for energy service and the selection and negotiation of electric service and energy service arrangements.

From 1981 - 1990, Mr. Vumbaco was associated with R.W. Beck and Associates (now SAIC) for eight and one-half years, the last four as a General Partner and Manager of that Firm's Denver Regional Office. While at R.W. Beck he was responsible for the conduct of the day-to-day operations of the Denver office and the direction and prosecution of all of the engagements on behalf of that firm in the geographic region served by the Denver Regional Office. During his tenure at R.W. Beck and Associates, Mr. Vumbaco was directly involved in prosecuting management consulting, engineering and engineering-economic assignments relating to supply-side planning, acquisitions and mergers of utility properties, combined utility system cost of service and rate design studies, non-recourse project financing, litigation support and settlement negotiations, utility revenue bond financings, contract development and negotiations for electric system interconnections and transmission service, project development, and joint ownership agreements for utility and industrial clients of the firm.

For the period of 1971 through 1981, Mr. Vumbaco was involved in the management, engineering and operations of municipal electric, gas, steam and water systems. From September, 1976 through November, 1981 he was the General Manager and Chief Engineer of the Hibbing Public Utilities Commission, Hibbing, Minnesota. He was responsible to a three-member Public Utilities Commission for the management, operations, maintenance and engineering associated with the planning, administration and operation of the combined utility power production, electric, water, gas and steam heating distribution systems. During the period 1979 through 1981, Mr. Vumbaco also directed the power supply planning and regulatory administration of the Northeastern Minnesota Municipal Power Agency, as its President and CEO.

During the period October 1971 through September 1976, Mr. Vumbaco was employed with the Department of Public Utilities, Town of Wallingford, Connecticut, first in the capacity of Executive Assistant to the Director of Utilities and then as Assistant General Manager and Chief Engineer of the Electric Division of that department. His principal responsibilities included the supervision of the operation of a coal-fired steam electric generating facility, engineering and supervision of the operating and maintenance of the electric transmission and distribution systems and the development of cost-of-service studies and rate designs associated with wholesale and retail rates.

From July 1969 through June 1970, Mr. Vumbaco was employed by Collins Radio Corporation of Dallas, Texas, as a Research and Development Engineer in their Avionics and Applied Sciences Division. His responsibilities included the development of power supply packages for in-flight navigational computer systems.

Mr. Vumbaco has authored and presented numerous papers on the effects of open access and customer choice on utilities; utility deregulation costs, benefits, and potential opportunities; competitive utility access matters; utility deregulation and the impact on municipalities; municipal franchise fees; electric utility retail wheeling issues; strategic utility supply and demand-side planning issues; and municipal acquisition of private utility properties.

In addition, Mr. Vumbaco has received accredited professional training from the following organizations in the following areas:

National Association of Regulatory Commissioners (NARUC)

- Best Practices for Evaluation of Efficiency Programs
- Dynamic Pricing Evaluation
- Exploring Aggregated Net Metering
- Smart Meters/Smart Grid
- Rate Design Issues for DSM and Smart Meters

National Society of Professional Engineers (NSPE)

- Engineering Ethics: A Conversation
- Ethical Issues in Communications and Marketing
- Ethics and Work: Balancing the Interest of Peers
- Engineering Ethics: Business Issues
- Ethics Forum: Professional Issues

Rocky Mountain Electrical League (RMEL)

- Financial Markets and their Impact on Electric Utilities
- Solar Renewable Technologies Conference
- Compact Linear Fresnel Reflector Solar Steam Generator Design and Application
- Thermal Energy Storage: Current Value and Future Directions
- Concentrating Solar Power Parabolic Trough
- Sierra Sun Tower Project
- Utility Scale Photovoltaic Power
- Integrating Wind Generation in the Pacific Northwest
- Managing Regulatory Risk Workshop
- Critical Industry Issues and Challenges
- Fundamentals of Risk Management
- Uncertainty and Risks from the Regulatory Process
- Assessment of Regulatory Risks
- Prioritization of Regulatory Risks
- Regulatory Risks Mitigation Tactics

Exploring the Benefits of Prepaid Electric Services
Creating a Model that Balances Customer, Public Policy and Utility goals
Cyber Security for Utilities
Strategy of Overcoming NIMBY Opposition
Emerging New Utility Models: New Rules for New Times
Resource Planning for an Aging Coal Fleet
Natural Gas, Distributed Power and Disruptive Business Models
U.S. Environmental Regulatory Update for Electric Utilities
Consideration of Future Environmental Regulations During the Integrated Resource Planning Process
GHG Permit – El Paso Electric Company Case Study
The Role of Reciprocating Engine Facilities in Tomorrow’s Flexible Generation Marketplace
Generating Resource Strategy Development
NOX Compliance Technology
Western Energy Imbalance market

Electric Utility Consultants, Inc. (EUCI)

Photovoltaic Projects for Utilities
Competitiveness of PV, Has it Arrived?
Navigating the U.S. Tax Code: What Every Utility Should Know
Solar PPAs
Property Assessed Clean Energy Financing
DG PV: Distributed-Scale Solar’s Role in the Renewable Portfolio
Photovoltaic Project Siting and Permitting
Utility Ownership of Solar PV Assets
Community Renewable Energy Projects and Remote Net Energy Metering

American Public Power Association (APPA)

Managing the Impacts of Distributed Generation
Time of Use Pricing – Power Supply