PROFESSIONAL MECHANICAL ENGINEER

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SUMMARY OF QUALIFICATIONS:

Twenty-five years professional engineering experience, including:

Mechanical: Design, development, analysis, and testing of structures, precision mechanisms, electro-mechanical assemblies, electronics enclosures, and automated machinery.

Energy: Policy analysis and development at local, state, and federal levels, including co-development of the IEEE 1547 Standard for Interconnecting Distributed Resources with Electric Power Systems. Design, development, and commissioning of solar-electric, solar thermal, and bio-thermal energy systems. Extensive analysis of building-energy performance and payback on upgrades.

Electrical: Design and development of programmable-logic and air-logic control systems for renewable energy and automated machinery applications. Circuit testing and troubleshooting proficiency.

Computer: Six years AutoCAD, extensive work with Microsoft Office applications.

Professional: New Mexico Registered Professional Engineer, No. 14519
IEEE Member No. 41286669

Publications: "*Going Off-Grid*", Good Cents Magazine, 1997, "*Market Driven Environmentalism*", The Eldorado Sun, 2001, "*Dismantling Democracy*", The Eldorado Sun, 2002, *"The Oil Endgame"*, The Eldorado Sun, 2002, *"The Hydrogen Hallucination"*, Energy Pulse Online, 2003, *"Bioenergy in the USA"*, Proceedings of the Central European Biomass Conference 2005, *"Community-Based Energy: A Return is Long Overdue"*, The Sun Monthly. "*Biomass-Fired District Energy: A Source of Economic Development and Energy Security*", self-published, 2006, "*Returning to Community Values with Biomass: Exploring the Feasibility of Neighborhood-Scale Biomass District Heating Systems in Santa Fe, New Mexico*", self-published, 2006.

Lectures: *The U.S. Energy Problem* and *Bioenergy in the USA*, (Central European Biomass Conference) and more than 60 related lectures and presentations on energy resource degradation and energy self-reliance. Also developed and taught *Introduction to Sustainable Energy*, *Community-Based Sustainable Energy*, and *Biomass Energy Vocations* at the Santa Fe Community College.

EDUCATION:

Virginia Polytechnic Institute and State U., Blacksburg, VA: BS Mechanical Engineering
Purdue University, Fort Wayne, IN: Graduate courses in engineering
University of Maryland, College Park, MD: Graduate courses, teaching, and research

PROFESSIONAL EXPERIENCE:

Local Energy – Santa Fe, New Mexico, 2003 – present.
Co-founder, Chair, and Executive Director – Directing and managing more than $2 million in research, education, and demonstration projects designed to improve energy security in Northern New Mexico. Designed six biomass-fired district heating systems, including the heat-load analysis, fuels study, hydronic design, pipe and pump sizing, financial analysis, and optimization of economic benefits. Received a *Santa Fe Future* award for quantifying the economic impacts of heating Santa Fe's downtown buildings with biomass. Researched the regressive economic impacts of declining energy-resource quality and best practices for addressing these hardships with renewable energy. Analyzed energy performance in commercial buildings, and recommended upgrades including estimating financial returns.

Energy Services Engineering – Santa Fe, New Mexico, 1997 – 2003.
Professional Engineer (Sole Proprietor) – Performed energy assessments on more than 5-million square feet of buildings, and prepared and presented reports recommending $3.2 million in annual energy savings under a joint program of the DOE and the NM State Energy Office. Designed and developed industrial, commercial, and residential on-site power and thermal energy systems, including system drawings (AutoCAD), electrical and thermal load studies, wind-load analyses, component and wire sizing, and code compliance demonstration.

Sardella Consulting – Brasstown, North Carolina, 1993 – 1997.
Mechanical Engineer (Contract) – Provided engineering services to local manufacturing companies, including tool and gauge design, structural analysis, and machinery modifications. Specified and procured CAD equipment, and trained engineers on AutoCAD. Also designed and built solar-electric and hydroelectric power systems for residences, developed control systems for battery charging and monitoring, and wrote user documentation. Interviewed on CNN's *Earth Matters* to discuss one of my hydroelectric systems.

University of Maryland – College Park, Maryland, 1989 – 1993.
Mechanical Design Engineer (Contract) – Developed spaceflight instruments for the Department of Space Physics. Designed and built precision mechanisms, structural housings, and electronics enclosures for spaceflight solar-wind experiments. Performed structural and thermal analysis, then verified designs with vibration, thermal, and operational tests. Designs and drawings were created with AutoCAD.

Finishing Technologies Incorporated – Columbia, Maryland, 1988 – 1989.
Mechanical Engineer – Designed and built automated machinery and control systems for the finishing industry, including painting robots, material handling systems, and environmental control systems. Created programmable-logic and air-logic control systems, and directed installation and startup of new systems.

ITT Aerospace – Fort Wayne, Indiana, 1985 – 1987.
Mechanical Design Engineer – Designed a long-life rotating assembly for a GOES weather satellite, including a detailed analysis of the bearing and lubrication system. Developed a methodology for determining the rate of lubricant loss, and patented a design of a fixture for carrying out accelerated life-testing of bearings. Developed a specification and test procedure for preparing ball bearings for spaceflight.

General Dynamics – San Diego, California, 1984 – 1985.
Mechanical Design Engineer – Engineering support for production of aerospace hardware.