

# Résumé of David Butler

PO Box 4663, Huachuca City, AZ 85616

[david@optimalbuilding.com](mailto:david@optimalbuilding.com)

## Profile

Recognized building systems engineer and home performance expert with multi-disciplinary background. Proven expertise in:

- Mechanical systems design for high performance homes; specialties include heat pumps, passive solar homes, net-zero homes, off-grid homes, natatoriums
- HVAC diagnostics and performance metrics, especially airflow
- Building science and home performance concepts
- Energy modeling & life-cycle cost analysis
- Software development; strong intuitive skills in boundary condition testing
- Technical writing and editing; technical content auditing
- Electric utility demand response and energy efficiency programs, including M&V
- Home automation ('connected home')
- Standards development for home performance, home networking and smart grid protocols

## Professional Experience

### **Owner / President, Building Systems Engineer**

2009–current Optimal Building Systems LLC, Sierra Vista, AZ

Specialize in mechanical design for high performance homes in all climate zones. Develop highly optimized and synergistic specifications for HVAC, envelope, domestic hot water, photovoltaics and other building systems based on building science principles, detailed energy modeling and life-cycle analysis. Clients include architects, home builders and homeowners. Optimal Building Systems also provides back-office mechanical design & training services to HERS raters and other home energy and design professionals. Related professional activities:

- Manage the largest home performance and building science discussion forum on the Internet
- Participate in building systems standards activities
- Evaluate residential energy monitoring and control systems, including calibration testing
- Prepare briefs for utilities commission dockets on net metering & renewable energy regs

### **Project Manager HVAC Services**

2005–2008 Environmental Building Solutions, Matthews, NC (Energy Star / HERS provider)

Provide load calculations, mechanical design services and HERS ratings for Energy Star builder partners in Charlotte area. Responsible for HVAC training and support for EBS raters.

### **Senior Building Systems Engineer**

2001–2004, 2008–2009 Enalays Corporation, Calexico, CA

Senior technical advisor to CEO and CTO of a dynamic start-up company, wearing many hats. Enalays produces leading-edge HVAC diagnostic tools and monitoring systems, and provides measurement and verification services to electric utilities for large scale energy efficiency programs. The company's flagship product, eScan™, consists of laptop software, wireless sensors and flow hoods designed to measure in-situ HVAC system performance in real time. The eScan system supports whole-house diagnostics through integration with tools produced by The Energy Conservatory. ChargeRite™, a derivative of eScan, is approved for HVAC compliance verification under California Title 24.

Enalaysys Corporation (continued)

- As company's senior energy analyst, responsible for thermodynamic and psychrometric calculations throughout the product line
- Managed eScan software redesign effort (functional logic, user interface, customer reports)
- Managed field test programs for eScan software and hardware
- Conducted proof-of-concept research for a residential gateway
- Developed rationale for minimizing the number of sensors required for in-situ performance monitoring of unitary HVAC systems (e.g., continuous commissioning)
- Wrote winning proposal for a Department of Energy SBIR grant for low-cost continuous commissioning for residential HVAC systems (partnered with Oak Ridge National Labs)
- Served as liaison to company's research partners
- Assisted in development of eOne Platform™, the company's cloud-based technology that supports utility-scale HVAC testing & verification programs and data collection services
- Developed test bed for validating airflow hood performance
- Responsible for technical content of eScan training curriculum and product literature
- Conducted directed research and wrote numerous technical briefs for senior management

**Owner / Consultant, Building Systems Engineer**

1985–2009 Residential Micro Systems

- Pioneer and recognized leader in the home automation industry (integrated home systems).
- Provided research and product development services to a variety of clients with primary focus on integrated home systems, advanced energy management strategies, evolving home networking standards, and human factors. Notable clients include GE, Smart House Ltd, Square D, Électricité de France, Lutron, Intellon, Egis Sarl, NorTel and Arvida Disney.
- Supported functional design of a network thermostat for a major electronics manufacturer.
- Core member of Consumer Electronics Bus (CEBus) committee (1985–1992), predecessor of CEA R7 Home Network Committee. Assisted in development of the CEBus Common Applications Language (CAL). Portions of CAL became the basis for IEC 12.22, the forerunner and a core communications protocol for today's 'smart grid' standards.
- Produced *At Home With Technology*, a popular nationally syndicated newspaper column that appeared weekly in four dozen newspapers including the Atlanta Journal & Constitution, San Jose Mercury News and The Cleveland Plain Dealer. Topics included home security, energy management, home automation, environmental control and whole-house audio-video. During column's 5-year run (1992–1997), employed small research and admin staff.
- Published numerous magazine and journal articles on evolving home automation industry, communication standards, energy management, and human factors.
- Designed former residence as a laboratory for advanced home systems research and acted as general contractor (1999, <http://veryuniquehome.com>). Incorporated sub-metering and flexible wiring raceways to support various monitoring and control projects. Developed unique wall design and thermal envelope. Beta tested Energy-10, a DOE-2-based energy simulation tool that was optimized for passive solar design and daylighting. Designed custom multi-zone forced air distribution and control system.
- Retrofitted current home with various efficiency improvements, load monitoring equipment and a 5kW mini-inverter photovoltaic system to achieve net-positive site energy.

## **Production Planning & Materials Management**

1975–1982 VF Corp (formerly Blue Bell, Inc.) and Springs Mills, Inc.

Held progressive positions in manufacturing management advancing to Director of Production Planning & Materials Management. As a member of senior management at Blue Bell's Puerto Rico Division, responsible for production schedules, work orders & purchasing for 7 factories producing 10 million Wrangler jeans annually. Also worked at the company's Sanford and Greensboro divisions, interrupted in 1978 by a 1-year stint with Springs Mills, Lancaster, SC.

## **Education**

### **Master of Science in Engineering**

1982–1984 North Carolina State University, Dept. of Electrical & Computer Engineering  
Major emphasis in digital design and communication systems theory; minor emphasis in software systems engineering; graduated at top of class

### **Bachelor of Science, Business Administration**

1970–1974 University of North Carolina at Chapel Hill

Major emphasis in production management with minor emphasis in cost accounting; worked part time throughout college; graduated Phi Beta Kappa

## **Notable Professional Activities and Honors**

- Founder of the Home Performance Forum, hosted by the Home Performance Coalition (2017)
- Owner-Manager of 11,000 member 'RESNET BPI' group on LinkedIn (current, since 2010)
- Contributor to 6<sup>th</sup> edition of Residential Energy, Krieger & Dorsi (2011)
- Co-authored ANSI/BSR BPI-3300 Standard for Residential Building Air Distribution System Energy Performance (2010)
- Department of Energy Building America Challenge Partner (2009-2012)
- Participant in LEED for Homes v4 revisions (2011-2012), Energy Star v3 revisions (2009), RESNET-NREL Existing Homes Software Taskforce (2008–2009); ACCA Review Committee for Manual D 3<sup>rd</sup> Ed. (2008); Arizona Corporation Commission Smart Meter Workshops (2007); PATH: Partnership for Advancing Technology in Housing (2002)
- Presenter at 2009 RESNET Conference: The Elephant in the Room – HVAC for High Performance Homes (abridged version published in Home Energy Magazine, Sept/Oct 2009)
- Associate member, ASHRAE (since 2001)
- Technical writer and consultant for Pathfinder - Strategies for Intelligent Products and Services for the Home, Parks Associates (1988–1989)
- Keynote speaker, DOMOTIQUE 88 – 1st International Conference on Intelligent Homes, Paris, France (1988)
- Charter member of the Home Automation & Networking Association (1988)
- Lead columnist for Electronic House Magazine, EH Publishing (1985–1987)
- CFPIM Fellow, American Production And Inventory Control Society (1985)
- Honoraries: Phi Eta Sigma (1971); Phi Beta Kappa (1973); Eta Kappa Nu (1984); Tau Beta Pi (1984); Phi Kappa Phi (1984); Upsilon Pi Epsilon (1984)

## **Professional References**

Client & peer testimonials may be found here: <http://optimalbuilding.com/references.php>