

DR. ERIN BOYD

Address: 67 Barbara Road, Orinda, CA, USA 94563

Mobile: 415-535-6659

E-mail: erin@gronenthalboyd.com | **Skype:** erin_boyd

KEY QUALIFICATIONS:

- ❖ A versatile **sustainable energy economist** who applies research skills and market analysis expertise to inform business decisions, project design and energy policy for public and private sector energy actors ranging from national governments to regional public utilities to local renewable energy projects.
- ❖ An expert on **energy access** issues in developing economies who has conducted research and provided advice on increasing renewable energy use within national and transnational power grids, marketing renewable sources to household energy customers, modelling tariffs and fee structures, and advising on projects across Africa, Asia and Eastern Europe.
- ❖ Extensive experience **working with multilateral and bilateral donors** including the World Bank, International Monetary Fund and U.K. Department for International Development.
- ❖ An **expert policy analyst** who has advised large utilities in the U.K., U.S. and E.U. on risk management, energy security and environmental energy policy compliance.
- ❖ A **proven leader** who increases team engagement and performance through relationships and elimination of barriers, has built and led world class research teams, managed operational teams, and developed a 75-person consulting practice.
- ❖ An **engaging communicator** who has designed and delivered presentations, TEDx speeches and panel discussions on a range of energy economy topics to a variety of audiences.

PROFESSIONAL EXPERIENCE:

Verbitas Consulting, San Francisco, CA

August 2019 – Present

CEO & Founder

Provides data-driven insights, accessible written products and economics consulting services to organizations and companies focused on sustainable energy and expanded energy access. Relevant projects include:

- Authored white-papers on the economics of blockchain in the energy industry and strategies for major energy corporations to engage with this innovation.
- Engaged with key U.S. Senate and Congressional staff to provide insights and research into optimal program design for electrifying transport.
- Established a world class, nationally-known research team for the Center for Sustainable Energy, a non-profit focusing on decarbonization through electrification of transport and distributed energy resources.

Apparent, Novato, CA

August 2018 – July 2019

Senior Vice President, Economics and Market Strategy

- Led economic analysis and prioritization of market opportunities for digital energy platform start-up.
- Identified potential revenue streams and market capture strategy for software enabling peer-to-peer and wholesale energy market trading of behind-the-meter (BTM) clean energy resources.
- Co-led \$35 million Series B raise and developed strategic partnerships; developed and launched go-to-market strategy resulting in \$40 million in new revenues demonstrating newly designed business model.
- Established policy, regulations and market rules at the local, state and federal level through multiple proceedings, including PJM DER Working Group, CPUC IDER process and FERC testimony.
- Created and executed programs to provide innovative clean energy access solutions including energy subscription services, non-wires alternatives, autonomous market arbitrage for solar/storage projects and market participation of BTM technologies.

Pacific Gas & Electric, San Francisco, CA

November 2015 – July 2018

Senior Manager, Day-Ahead and Real-Time Operations

December 2017 – July 2018

- Oversaw bidding, scheduling and dispatch of 20 GW portfolio to minimize costs and maximize revenues, managing a team of over 30 traders and policy analysts.

- Achieved targeted ROI on \$5 billion/year in transactions while complying with strict regulatory and contractual standards.
- Developed, promoted and provided inputs into strategies for the electric supply portfolio and long-term energy planning, policy and procurement activities, including new opportunities for revenues.
- Promoted continuous improvement across the Day-Ahead and Real-Time teams and 500+ processes to drive measurable improvements associated with reliability and affordability.
- During 8-month tenure: unified dashboards, improved or eliminated 50+ ineffective processes, decreased costs by \$600K, and introduced evidence-based decision making for bidding, scheduling and operations to increase revenue and competitiveness.

Manager, Measurement, Data and Analytics

November 2015 – November 2017

- Directed a team of 40+ individuals providing research & analytics driving customer behavior and adoption.
- Improved efficiency of internal operations through self-service data tools and visualization resulting in 10% reduction in work time, a data quality initiative reducing the cost of bad data by 40%, prioritization of work to ensure alignment with company goals, and algorithm to reduce call center costs by 10%.
- Drove the development and adoption of a suite of measurement/forecasting/predictive models for marketing and performance analytics, with marketing attribution rates increasing by 3 to 5 times, customer identification by up to 33%, and forecasting accuracy by 10%.
- Received an employee performance rating in the Top 15% for results.
- Solutions included primary research, pilot design, impact measurement and evaluation, visualization, metric design, customer propensities, segmentation, predictive analytics, and machine learning.

Snohomish Public Utility District, Everett, WA

February 2014-November 2015

Senior Manager Rates, Economics and Energy Risk Management

- Led the development of critical information and analysis for rates and energy risk management.
- Provided economic and strategic analysis for energy resource related projects such as new power supply and generation, new demand side resources and utility-scale energy storage.
- Managed the development of economic and statistical models to analyze the effects of policy action on the District, the local economy and customers including price elasticity studies, local employment impacts of rate changes and the effects of fuel switching.
- Created a nimble, data-driven internal consulting group which identified insights, solved complex problems and provided decision-making support for teams across business functions.
- Reduced the value at risk by 20% by updating internal department functions – load forecasting, risk management, and cost-of-service – to ensure alignment with goals, objectives and needs.

Economic Consulting Associates, London, United Kingdom

June 2009 – February 2014

Managing Economist

Provided structured and analytical solutions to infrastructure problems; advised on policy development, economic and financial analysis, the design of institutional and legal frameworks, market design and regulation of infrastructure for a wide range of clients across Africa, Asia and Europe. Relevant projects include:

- *Commercial Due Diligence Study for an IPP in Ghana* (2013): Prepared operation and cost projections for power plants supplying the electricity market; assessed the revenues required by the transmission/distribution off-taker to satisfy demand for next 20 years. Assessed the impact on electricity tariffs and conducted affordability analysis to understand affordability of resulting tariffs for the lower income consumers connected to the grid.
- *Greater Mekong Sub-Region (GMS) Strategic Environmental Assessment* (2011-2013): Developed detailed strategy to develop a reliable, environmentally and socially sustainable regional electricity supply in the GMS.
- *Harnessing African Gas for African Power* (2013): Investigated the challenges of transforming Africa's abundant gas resources into power. Estimated the existing and future call on thermal power generation for each of the 47 countries of Sub-Saharan Africa through an Excel/VBA power dispatch model and made recommendations on market integration, regulation and policy solutions.

- *Western Balkans Sustainable Energy Direct Financing Facility* (2009-2014): Managed and prepared €3 million framework contract for national renewable energy action plans to estimate required feed-in tariff levels and to determine implications of strategies for attainment of EU renewable energy targets for 2020, including development of economic analysis models and long-term scenario analysis.

Redpoint Energy, London, United Kingdom

April 2007 – May 2009

Economics Consultant

Advised clients on investments, strategy and regulation across power, gas and carbon markets; provided advice and analysis on areas including electricity trading arrangements, generation asset investment, risk measurement, retail pricing strategies and carbon market price formation. Relevant projects include:

- *Implementation of the EU 2020 Renewable Energy Target in the UK Electricity Sector (2009)*: Led modelling for UK Department for Energy and Climate Change study to develop strategy for meeting Renewable Obligation.
- *Role of Increased Intermittent Generation on Security of Supply and Prices in the UK (2008-2009)*: Constructed and estimated measures to capture security of supply and portfolio risk based on the mix of intermittent generation and thermal plant.

Project Gaia | Shell Foundation, Addis Ababa, Ethiopia

May 2004 – May 2005

Energy Economist & Project Manager

- Oversaw pilot project to assess the costs and benefits of a household market for ethanol.
- Designed and conducted analysis at all stages, including selection of the primary and secondary influences of household energy demand, forecasting potential demand for ethanol based on household surveys, and conducting economic and financial analysis of the overall market size and prices, including the interaction with prices for other energy sources.
- Key outputs involved linking micro-economic data collected through household surveys (which Erin designed and conducted as part of this project) to macro-data on the economy (e.g., foreign exchange earnings), environment (e.g., deforestation), geo-politics (e.g., border dispute with Eritrea), and culture (e.g., religious affiliation) to assess the potential of developing a market.

Carnegie Mellon Electricity and Industry Research Center, Pittsburgh, PA

August 2002 – May 2004

Research Fellow

- Defined methodologies for establishing economic price signals for electricity transmission.
- Developed a competitive market pricing mechanism for reactive power/voltage control using constrained optimal power flow equations and real-time power flow data.
- Designed a non-linear constrained optimization algorithm to determine optimal investment decisions in reactive power provision in both a societal and private framework.

EDUCATION:

-
- | | |
|---|--------------------|
| • Certificate in Corporate Innovation , <i>Stanford University School of Business</i> | August 2018 |
| • Ph.D., Economics , <i>School of Oriental and African Studies, University of London</i> | March 2009 |
| • M.S., Economics , <i>Tepper School of Business, Carnegie Mellon University</i> | May 2004 |
| • B.A., Economics , <i>Reed College, Phi Beta Kappa</i> | May 1999 |

ADDITIONAL INFORMATION:

Computer Skills: Statistical/Data: SAS, SPSS, R, Stata, @Risk, MATLAB, SQL, VBA, Python, Tableau, Power Systems/Market Modelling: Optgen, PLEXOS, SDDP, WASP

Countries and Regions of Work Experience: Albania, Armenia, Bosnia and Herzegovina, Croatia, Democratic Republic of the Congo, Egypt, Ethiopia, European Union, Ghana, Greater Mekong Sub-Region, Hungary, Kenya, Kosovo, Lesotho, Malawi, Montenegro, Moldova, Mozambique, Philippines, Rwanda, Southern Africa Development Community, Sri Lanka, Sub-Saharan Africa, Tanzania, United States, United Kingdom, Western Balkans, Zimbabwe

PROFESSIONAL MEMBERSHIPS:

- Association of Edison Illuminating Companies, Load Research and Analytics Committee – Second Vice-Chair and Member
- Utility Analytics Association, Conference Board – Customer Analytics and Member
- TechWomen, US Department of State Program – Mentor and Emerging Leader Selection Committee
- Association for Energy Economics – Member
- Institute of Electrical and Electronics Engineers – Member

PRESENTATIONS:

Presentations:

- 5th Annual Distribution and Innovation Forum, Chicago, IL, Data is Transforming Energy Management and Customer Analytics, *September 19, 2019*
- Coil Winding Insulation and Electrical Manufacturing Exhibition, CWIEME Americas Chicago, IL, Global EV Outlook, *September 17, 2019*
- 7th Annual California Energy Summit, Executive Briefing, Los Angeles, CA, Integrating Distributed Energy Resources into Wholesale Markets, *July 16, 2019*
- Stanford Graduate School of Business VC Bootcamp, Investor Pitch, Palo Alto, CA, Apparent Series B Investor Pitch, *March 12, 2019*
- Peak Load Management Alliance, PLMA Monthly Dialogues, WebEx, Integration of Demand Response and Distributed resources into wholesale markets, *October 9, 2018*
- Association of Edison Illuminating Companies, Load Research and Analytics Meeting, Charleston, SC Customer Analytics at PG&E, *November 7, 2017*
- Women in Energy Symposium, San Diego, CA Opening Remarks, *November 1, 2017*
- IoT for Utilities, San Jose, CA, How IoT & Big Data are Changing the Way We Operate, *December 7, 2016*
- Women in Energy Symposium, Las Vegas, NV, Non-Traditional Communication Techniques: From Ted Talks to Field Ops, *November 3, 2016*
- Utility Analytics Week, Atlanta, GA, The Application of Math, Science and Technology at FPL & PG&E, *November 1, 2016*
- SW Forecasting, Tucson, AZ, Incentivizing Customer Participation, *September 16, 2016*
- Western Load Research Association Spring Conference, Anaheim, CA, Identifying EV Owners Using 15-minute Load Data, *April 16, 2016*
- Association of Edison Illuminating Companies Load Research and Analytics Meeting, Austin, TX How Data is Transforming Energy Management at Snohomish PUD, *November 11, 2015*
- TedX, Edmonds, WA, What Matters Most: Birds or Fish?, *November 6, 2015*
- Washington Future Energy Conference, Seattle, WA, Grid Services: Capturing the Value Stream, *November 2, 2015*
- Utility Analytics Week, New Orleans, LA, Use of Geo-spatial and Situational Intelligence for Utility Insight, *October 30, 2015*
- Energy Storage North America, San Diego, CA, Optimization of Our Energy Storage Fleet, *October 14, 2015*

Panel discussions:

- Global Corporate Venturing - Energy, Houston, TX, Panel Discussion: As transport disrupts energy and energy disrupts transport, who will be left standing, *November 21, 2019*
- 2nd Annual Power & Energy Blockchain Conference, Energy Blockchain Consortium, Atlanta, GA, the Economics of Blockchain, *October 25, 2019*
- Bloomberg New Energy Finance Summit, New York, NY, Panel Member, Utility Trends and Disruption, *April 13, 2015*