

ISMAEL E. ARCINIEGAS RUEDA, PH.D.

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SUMMARY

A dynamic and goal-oriented INFRASTRUCTURE EXECUTIVE specializing in the energy commodities industry with comprehensive domestic and international expertise in quantitative analytics, policy research, forecasting, valuation, pricing, cost analysis, and structuring (wholesale, retail, and renewables), origination, trading (financial transmission rights (FTRs)) and fundamental analysis, hedging, R&D, and energy risk management. Leverages excellent multi-cultural communication skills to build and lead top-performing teams, collaborate with global partners, and interface with C-level leadership. Proven aptitude for delivering forward-thinking solutions to drive competitiveness, increase financial performance, and achieve key company objectives.

EXPERIENCE

RAND, Arlington, Virginia

Sr Economist. 2018-Present

Leads RAND's team supporting FEMA on the cost validation of multibillion-dollar investments in utilities' infrastructure (power/water) required for the reconstruction of Puerto Rico and US Virgin Islands after hurricane Maria

- Starting from zero, managed the recruitment, training and certification of a group of 20 professionals across several locations (DC, Puerto Rico, Santa Monica, CA) responsible for the validation of 12 billion dollars of Public investments in Utilities (power/water) in Puerto Rico and US Virgin Islands.
- Responsible for the acquisition of tools and development of procedures required for the analysis and validations of investments in the reconstruction of Puerto Rico and US Virgin Islands' utilities
- Lead author in the development of high-profile analysis on the reasonableness of emergency expenditures in Puerto Rico electric sector after Hurricane Maria
- RAND's lead on policy research as it applies to energy markets
- Mentors RAND's staff on energy markets by developing energy markets training opportunities at RAND's Pardee Public Policy Graduate school.

THE AES CORPORATION, Arlington, Virginia

Vice President of Global Commercial Operations, 2017-2018

Coordinated development of global customer focus and product development strategies. Promoted standardization of structuring, valuation, and quantitative analytic capabilities.

- Co-led implementation and adoption of global energy trading risk management (ETRM) systems across different markets in Northern Ireland, Chile, PJM, Panama, and Dominican Republic.
- Sponsored development of value-added C&I products in LATAM and Europe (NI) power markets.
- Led harmonization of AES valuation methodologies of assets (Gas, Coal, Storage, Hydro, Wind/Solar) and contracts (Power Purchase Agreements, Tolls) across company's global footprint.

PUBLIC SERVICE ENTERPRISE GROUP INCORPORATED (PSEG), Newark, New Jersey

Head of Structuring and Quantitative Analytics, Energy Resources and Trade (ERT), 2010-2017

Directed quantitative and structuring team of seven personnel responsible for valuation and management of structured products bridging trading and marketing functions in wholesale energy markets. Oversaw full-requirement wholesale load contracts, slice-of-system load contracts, financial and physical tolling agreements, heat rate options, and unit-contingent, solar, wind, and locational spread options. Led quantitative team responsible for providing analytics for optimal hedging, risk management, load forecasting, load migration forecasting, auction revenue rights (ARRs), and ancillaries valuation. Served as member of PSEG ERT Senior Leadership Team; advised and developed vision and strategic plans for ERT growth and value creation. Supported commercial efforts and brand by participating in C-level meetings with customers, speaking at conferences and workshops, and publishing industry-related articles.

- Oversaw structuring/bidding and management of wholesale, full-requirements load deals in PJM (BGS, PECO, PPL) and NEPOOL (e.g., CLP, NGRID, UI), contributing 80% to ERT annual origination P&L, amounting to roughly \$21MM per year.
- Co-led organic development of PSEG retail energy business, PSEG Energy Solutions.
- Built structuring team from scratch to become driving force of ERT innovation and competitiveness.
- Accountable for valuing optionality in acquisitions divestitures and development projects.
- Managed valuation and structuring of several tolling agreements (e.g., Granite Ridge, LS Power), financial heat rate options (e.g., Millennium, Sayreville), power options, spread options (e.g., NY VFT Transmission line), and unit-contingency agreements.
- Supervised development of renewable pricing models, such as solar, storage, biomass, trash burning, and wind.
- Developed ratable and programmatic system for optimizing hedging of base load fleet.

- Oversaw development of forward curve simulators for trading in calendar spreads (gas and power).
- Led development of quantitative library needed for valuation and risk management of ERT energy portfolio, including generation assets, full requirement contracts, options, and other derivatives.
- Managed PSEG and Princeton University partnership to develop applicable research in energy markets, achieving first tangible results from PSEG-Princeton collaboration.

CONSTELLATION ENERGY GROUP (CEG), Baltimore, Maryland
Vice President of Research and Development, Constellation New Energy (CNE), 2006-2010
CNE Director of Quantitative Analysis, 2005-2006
CNE Mid-Atlantic Pricing Manager, 2004-2005

Supervised quantitative staff of four in charge of CNE product management and development of load serving risk management products for retail customers. Directed design, business analysis, beta testing, implementation, and commercialization of CNE energy risk management products for retail C&I customers. Supported commercial efforts by participating in C-level meetings with customers, speaking at conferences and workshops, and publishing industry-related articles. Supervised mid-Atlantic CNE pricing team.

- Built CNE R&D team from scratch.
- Administered CNE retail pricing models and retail valuation models
- Designed CNE renewables (REC, Carbon) and demand-response pricing models.
- Managed CNE fuels (oil, gasoline, diesel) pricing and product modeling.
- Managed CNE origination pricing and modeling (e.g., unit-contingent, firm, etc.).
- Developed models for supply optimization of CNE's energy portfolio.
- Structured and priced several multimillion-dollar retail deals.
- Built fundamental analysis models for electricity forward price forecasting and market timing.
- Contributed to development of CNE's ARR and FTR trading strategies.
- Developed attribute-based clustering maps for customer segmentation and marketing.

ADDITIONAL EXPERIENCE

PULSAR ADVISORS. Arlington, Virginia, **Co-Founder**, 2018 - Present. Founded Pulsar to provide Advisory services in asset and portfolio management, risk management and market investments with focus on the energy and infrastructure sector. Recent engagements include: Advised a major Canadian power company on setting a US wholesale load trading desk, Advised Chilean investors on opportunities on the Colombian power market.

CATHOLIC UNIVERSITY OF AMERICA. Washington DC 2018 – Present. **Adjunct Professor**. Department of Economics. Teaching graduate classes in Energy Economics and Econometrics.

RUTGERS UNIVERSITY. BUSINESS SCHOOL. Newark, New Jersey, 2010 – 2017. **Executive Board Director Quantitative Finance Program**. Top 10 Quantitative Finance Program in the US.

PACIFIC ECONOMICS GROUP (PEG), Madison, Wisconsin, **Senior Economist**, 2003. Managed marketing and business development activities in Latin America. Established high-level commercial relationships with senior decision makers in Panama, Colombia, Uruguay, and other Latin American countries. Led consulting practice in wholesale power markets. Developed models in VBA for assessing EDC risks under different tariff structures. Provided consulting services on regulatory issues (gas/electric) for several utilities in U.S. and overseas.

TRANSALTA ENERGY MARKETING (U.S.) INC., Annapolis, Maryland, **PJM Financial Transmission Trader**, 2002. Directed trading of financial transmission rights in PJM. Managed FTR quantitative team. Developed pricing system for trading financial transmission rights in PJM. Led company's quantitative and fundamental analysis efforts for wholesale trading in U.S. Built fundamental-based forecasting model of Ontario real-time electricity price. Implemented bootstrapping models for computing gas-electricity correlations in Northeast. Built several statistical models (e.g., EGARCH, ARIMA) for forecasting day-ahead and real-time prices.

LOS ALAMOS NATIONAL LABORATORY, LLC, Los Alamos, New Mexico, **Researcher**, 2001. Estimated time series models to analyze power market efficiency for New York, PJM, and California electricity markets. Published work in peer-reviewed journal. Analyzed models of market power.

EDUCATION

UNIVERSITY AT ALBANY, Albany, New York
Ph.D., Economics, 2002
M.A., Computational Economics, 2000

UNIVERSIDAD DE LOS ANDES, Bogotá, Colombia
M.A., Economics, 1995

UNIVERSIDAD JAVERIANA, Bogotá, Colombia

B.S., Civil Engineering, 1994

ADDITIONAL EDUCATION

Certificate, Global Executive Leadership, Georgetown University, 2017
Certificate, Advanced French Language, Université Stendhal, Grenoble, France, 1998

AWARDS AND PATENTS

Executive Board of Directors of Master in Quantitative Finance at Rutgers University, 2011
Constellation Energy Top Performer Award, 2008
Notable Alumni, Economics Department, University at Albany, 2008
Constellation New Energy Patent: i2i. A novel approach of optimizing retail electricity purchases, 2005
Constellation Energy, Key Contributor Performance Award, 2004
TransAlta Performance Share Ownership Award, 2002
GSO Research Grant, University at Albany, Albany, New York, 2001
Larry Chenault Research Award, University at Albany, Albany, New York, 2000
Best Thesis, Universidad Javeriana. Civil Engineering Department, Bogota, Colombia, 1994

PUBLICATIONS

RESEARCH REPORTS, BOOKS AND BOOK CHAPTERS:

“Reasonableness Analysis of Cobra Acquisitions, Emergency Contract,” with M Hanson, M Brauner, I Chang, M Izenberg, T Nguyen, K Klima. RAND Research Report. Forthcoming

“Explaining Currency Crises: A Statistical Machine Learning Approach”. Lambert, 2010.

“Exploring Financial Crises Data with Self-Organizing Maps,” with M., Embrechts and B., Daniel. *Advances in Self-Organizing Maps*, Allinson, N. et al. (eds), Springer-Verlag, 2001.

SCIENTIFIC JOURNALS AND PROCEEDINGS:

“A NonParametric Structural Hybrid Modeling Approach for Electricity Prices,” with S Moazeni, M Coulon, B Song, and W Powell. *Quantitative Finance*, 2016, Vol 16, pp 2013-2030

“Empirical Analysis of Speculative Attacks with Contractionary Real Effects,” *Intelligent Systems in Accounting, Finance, and Management*, 2012, 19, pp 102-127

“SOM Based Data Analysis of Speculative Attacks’ Real Effects,” with F., Arciniegas. *Journal of Intelligent Data Analysis*, 2009, Vol 13/2 pp 261-300

“Forecasting Short Term Power Prices in the Ontario Electricity Market (OEM) with a Fuzzy Logic Based Inference System,” with A., Arciniegas. *Utilities Policy*, March 2008, Vol 16/1 pp 39-48

“Variable Selection with Partial Least Squares Sensitivity Analysis: An Application to Currency Crises’ Real Effects,” with F., Arciniegas and M., Embrechts. *Journal of Intelligent Data Analysis*, January 2008, Vol 12/1

“Important Variables Explaining Ontario Real Time Price,” with A., Marathe. *Utilities Policy*, March 2005, Vol 13/1, pp 27-39

“SVM Sensitivity Analysis: An Application to Currency Crises’ Aftermaths,” with F., Arciniegas and M., Embrechts. *IEEE Transactions on Systems, Man, and Cybernetics – Part A. Humans and Systems*, May 2004, Vol 34/3, pp 387-398

“Assessing the Efficiency of US Electricity Markets,” with A., Marathe and C., Barrett. *Utilities Policy*, June 2003, pp 75-86

COMPUTER SKILLS

Programming in S, R, Python, Visual Basic, and SQL. Familiarity with FEA Valuation Tools

LANGUAGES

Fluent in Spanish, French, and German.