

David Coleman is a partner at the NorthBridge Group, a leading economic and strategic consulting firm that serves the electric and natural gas industries, including both regulated utilities and the competitive segments of these industries. Mr. Coleman advises Fortune 500 and smaller energy companies on matters related to energy and capacity price forecasting, market design, commodity risk exposure, business and regulatory strategy, asset valuation and portfolio management, electricity supply procurement, product pricing, and overall corporate strategy in the face of significant industry changes. Mr. Coleman's expertise involves developing and implementing the sophisticated analytical tools necessary to analyze challenging strategic questions.

Mr. Coleman's recent consulting engagements include the following:

- Mr. Coleman has provided expert guidance on market design in ERCOT with respect to the Operating Reserve Demand Curve (ORDC). His analysis focused on the economics of asset investment and system reliability under different scarcity pricing mechanisms. He developed and a large-scale reliability simulation for this analysis and co-authored the report "Economic Equilibrium and Reliability in ERCOT", filed with the PUCT in December 2017. Mr. Coleman also provided advice to the same client on the value of implementing a similar market design in PJM.
- Mr. Coleman has advised a large midwestern generation owner on offering strategies for PJM RPM Base Residual Auction in several recent auctions. Mr. Coleman developed a model which replicates the auction clearing algorithm utilized by PJM and used the model to analyze the potential for capacity price congestion between load deliverability areas (LDAs).
- For a large owner of merchant generation, Mr. Coleman provided guidance on the financial costs and risks associated with incremental gas sales from an LNG terminal faced with both uncertain demand from existing contractual obligations and an inflexible delivery schedule.
- For a midwestern client, Mr. Coleman provided support by reviewing and identifying analytical flaws in an expert report prepared on behalf of one of the client's customers. The report identified purported cost savings associated with the customer's desired migration between RTOs. However, Mr. Coleman identified several critical flaws in the report. He then supported the client by generating corrected workpapers and drafting testimony.
- Mr. Coleman co-authored an expert report providing an independent and objective analysis of a client's business practices toward its competitive electric retail customers. The report was produced to counter claims made in civil litigation that the client had engaged in unfair business practices.
- Mr. Coleman developed a risk assessment tool which incorporates a stochastic mean-reverting model of commodity prices, inter-commodity correlations and stochastic volatility. The model has been used to illustrate potential spot price outcomes as well as potential forward curve movements for natural gas and electricity commodities in a variety of hedging valuation projects.
- Mr. Coleman provided strategic guidance to a large midwestern utility with respect to offering capacity into the PJM capacity market. In particular, the client was concerned about potential penalties that could arise from PJM's capacity performance (CP) product. Mr. Coleman designed and implemented a stochastic model that simulated resource outages across PJM, calculated CP penalties and credits, and determined the client's risk exposure.
- For a large midwestern utility, Mr. Coleman designed and implemented a system to model the gross margin from the client's merchant generation and retail positions. The model provided strategic insight into the profitability and risk associated with pursuing different retail strategies and their efficacy in hedging a large merchant generation exposure. Features of the model included a stochastic representation of energy and fuel prices, generating resource outages, and stochastic retail load profiles.

- Mr. Coleman conducted economic and financial analyses supporting a large Southeastern utility's proposal to acquire natural gas reserves and long-term natural gas forward contracts to hedge their customers' commodity price exposure. The project included valuing financial derivatives, forecasting commodity price volatility, and calculating the rate impacts of different natural gas hedges.
- For a large Midwestern utility, Mr. Coleman provided the principal analytical support for risk distributions of off-system wholesale energy margins. The analysis utilized a stochastic model of electricity and natural gas prices, load levels and unit outages in conjunction with an hourly dispatch model.
- Mr. Coleman utilized a stochastic model of natural gas prices to evaluate whether a large-scale gas hedging program could adequately hedge system production costs for a gas-based electric utility. The analysis involved evaluating credit and mark-to-market requirements.
- For a large utility in Texas, Mr. Coleman evaluated the ability of large nuclear operating companies to improve performance by reducing forced outages. Mr. Coleman conducted an analysis illustrating the 'long-tail' nature of nuclear forced outages and the replacement power cost risks associated with liquidated-damages contracts.
- Mr. Coleman conducted analyses and provided strategic guidance to a large southwestern merchant generator regarding proposed changes to the ERCOT market. The work focused on evaluating the newly proposed Operating Reserve Demand Curve (ORDC), including its parameters and the likely market response to its implementation. Mr. Coleman developed analytical tools specifically designed to model the ORDC under stochastic load and outage conditions in ERCOT.
- For a large integrated utility in the Southeast, Mr. Coleman used a real-option framework to identify the optimal investment approach for a deferrable nuclear investment. Mr. Coleman quantified the value created by deferring the investment and learning more about potential carbon regulation and gas price movements and the value lost by foregoing attractive government debt guarantees and equipment purchase incentives.
- For a large integrated utility in the Southeast, Mr. Coleman performed an in-depth analysis of the costs and benefits of a new coal-based resource in a predominantly gas-based market. He analyzed the future uncertainty surrounding carbon costs and the costs of a gas-based alternative resource. The analysis emphasized the distinction between cost savings on an expected basis versus the probability of achieving savings.
- For a large integrated utility in the Southeast, Mr. Coleman utilized a real-option approach to value the benefit of delaying further capital commitment in a project that had become only marginally cost competitive.
- For a large integrated utility in the Southeast, Mr. Coleman determined CO<sub>2</sub> allowance price levels that would force the retirement of a coal unit. Mr. Coleman identified retirement thresholds for both scrubbed and unscrubbed resources.
- For a large Texas utility, Mr. Coleman evaluated the economics of potential coal resource expansion plans in ERCOT, including the identifying the point at which further resource development would cannibalize margins due to market price depression.
- For a large integrated utility in the Southeast, Mr. Coleman assessed the economics of biomass co-firing in coal units and the implied cost of CO<sub>2</sub> abatement. Separately, Mr. Coleman evaluated the revenue requirement of a purpose-built biomass facility and its ability to provide a hedge against future carbon allowance costs.

- Mr. Coleman advised a not-for-profit organization on the economic viability of a new compressed air wind energy storage technology. He developed a model using linear programming to optimized storage and generation decisions thereby maximizing value.
- Mr. Coleman conducted risk analysis and strategic support for a large Eastern utility evaluating its general wholesale procurement process, including forecasting retail rates, credit requirements, rate volatility, and comparing full requirements approaches to active portfolio management.
- For multiple utilities, Mr. Coleman has advised on the financial impact of long term purchase contracts (PPAs) on the utilities' cost of capital and on the indirect costs ultimately paid by customers.
- For a large southeastern utility, Mr. Coleman developed a methodology to value the costs to customers of margin posting requirements associated with wholesale fuel hedges.
- Mr. Coleman developed an assessment of the value retail customers implicitly place on utility rate stability by evaluating analogous risks and costs in the fixed-rate mortgage market.

Mr. Coleman graduated cum laude from Dartmouth College with an A.B. in physics and received his M.B.A. from the Tuck School at Dartmouth where he was a Tuck Scholar, and where he serves as a guest lecturer. Before returning to Dartmouth for his business degree, Mr. Coleman was a Research Analyst at The NorthBridge Group.