LONDON ECONOMICS INTERNATIONAL LLC

INTRODUCTION TO LONDON ECONOMICS

London Economics International LLC (LEI) is a global economic, financial, and strategic advisory professional services firm specializing in energy, water, and infrastructure. The firm combines detailed understanding of specific network and commodity industries, such as electricity generation and distribution, with sophisticated analysis and a suite of proprietary quantitative models to produce reliable and comprehensible results.

The firm also has in-depth expertise in many economic and financial issues related to the electricity sector, such as asset valuation, procurement, regulatory economics, and market design and analysis. LEI has done extensive work with electricity markets in North America, Europe, Asia, and the Middle East, and has a comprehensive understanding of the issues faced by the utilities and regulators alike.

The following attributes make LEI unique:

- *clear, readable deliverables* grounded in substantial topical and quantitative evidence;
- *internally developed proprietary models* for electricity price forecasting incorporating game theory, real options valuation, Monte Carlo simulation, and sophisticated statistical techniques;
- *balance of private sector and governmental clients* enables LEI to effectively advise both regarding the impact of regulatory initiatives on private investment and the extent of possible regulatory responses to individual firm actions;
- *ability to estimate relative efficiency levels* and efficiency frontiers provides expertise to advise on network tariffs and design rates under performance-based ratemaking; and
- *worldwide experience* backed by multilingual and multicultural staff.

LEI has extensive experience in several areas, including:

ELECTRICITY: London Economics International LLC has participated in the birth and development of competitive electricity markets worldwide. Our strategy practice has helped traditional IOUs in the creation of competitive gencos, assessment of the establishment of independent transcos, and valuation of synergies with associated businesses. Market design achievements include use of game theoretic techniques to assess bidding strategy and creation of sophisticated contracting structures to mitigate market power.

NATURAL GAS: LEI's natural gas related activities include assessment of the synergies between the natural gas and electric power industries, examination of performance-based ratemaking and total factor productivity for natural gas distribution companies, and developing screening methodologies for potential investments in the natural gas industry.

TRANSPORTATION: London Economics is at the forefront of analyzing key issues related to pricing and privatization of key transportation infrastructure. This includes analysis of the implications of road pricing, regulation and development of privatized ports, and lessons from the UK rail privatization process.

RENEWABLES: LEI provides a range of services associated with the renewable energy industry. This includes working with developers to value potential revenue streams from renewable energy credits (RECs) and/or emissions offsets, advising private equity funds to craft investment plans targeted at "green" technologies, and counseling governments and regulators on creating policies which efficiently incentivize investment in renewable energy.

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Asset Valuation, Price Forecasting & Market Analysis

London Economics International LLC (LEI) provides valuation, price forecasting, and market analysis in a broad range of energy and infrastructure industries, including electricity generation, transmission, and distribution, natural gas networks, water and wastewater treatment, mass transit, airports, and highways. By combining exhaustive sector specific knowledge and a suite of proprietary quantitative modeling tools, LEI provides reliable, independent, substantial, and comprehensible valuation-related deliverables.

LEI's modeling approach has been refined over a nearly twenty year period to incorporate state-of-the-art statistical and market dynamic examination techniques when analyzing competitive wholesale markets. Our strengths include an ability to interpret incentive-based rates, quantify potential efficiency gains, relate revenue growth to population, weather, and local economic trends, and identify regulatory and technological risks.

Tools Employed

Wholesale Electricity Market Models: Using POOLMod, our proprietary pool simulation model; CUSTOMBid, a game theoretic framework which analyzes strategic bidding behavior; real options valuation techniques; and Monte Carlo scenario analysis, our team is able to develop a range of plausible wholesale electricity market outcomes, which we then employ to forecast revenues to generation stations.

Comparative Network Efficiency Calculator: We employ techniques such as total factor productivity modeling and data envelopment analysis to determine the relative and potential efficiency of network industries. These techniques identify the magnitude of potential cost savings for particular networks, and thus the possible upside under incentive-based rates.

Cost of Capital Database: By maintaining an expansive database of industry-wide and company specific betas and capitalization ratios, an up-to-date understanding of market-risk premiums and their application in international settings, and a practical knowledge of hurdle rates employed in actual transactions, LEI is able to quickly and defensible calculate the appropriate cost of capital for any specific investment.

Contract Configuration Matrices: Our detailed understanding of force majeure provisions, minimum credit standards, backstop arrangements, and other contract elements enables us to calculate the value of each element and incorporate it into consideration of the overall transaction, and to suggest more favorable configurations.

Representative Engagements

Cross-border Leasing of Water and Wastewater Treatment Facilities: For a US investor leasing European wastewater assets, we analyzes revenue streams to the facilities, calculated and configured required subsidy arrangements , identifies required contractual elements, and stress-tested results against varying population and economic growth scenarios. LEI has advised over 20 such transactions in a number of infrastructure industries with a total value approaching $30 billion USD.

Bid To Acquire Integrated Midwestern Utility: We advised on all aspects of valuation and risk identification associates with the proposed acquisition of an integrated US electric and gas utility, including valuation of generation assets, distribution networks, provider of last resort obligations, and regulatory risks.

Purchase of Ontario Hydro Stations: LEI provided comprehensive revenue analysis for a successful bid for hydro stations in Ontario, including multiple hydrological scenarios, real options analysis, and identification of strategic benefits. We have advised on numerous successful hydro and fossil plant acquisitions internationally.

Revenue Analysis for Independent Transmission Company: For the first stand-alone transmission company in North America, LEI assessed the appropriate cost of capital, recommended a regulatory strategy for a transition to incentive based rates, examined the potential for cost gains, and opined on whether forecasts of future operating income were credible.

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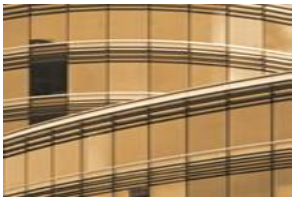
Asset Valuation, Price Forecasting & Market Analysis

Regulatory Economics, PBR & Market Design

Expert Testimony & Litigation Consulting

Transmission

Renewable Energy



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REGULATORY ECONOMICS, PBR & MARKET DESIGN

Our regulatory economics practice examines the universe of economic and financial issues facing regulators, market institutions, and regulated companies. Using quantitative modeling techniques, exhaustive knowledge of innovative regulatory practice worldwide, and a sound grasp of underlying economic principles, London Economics International LLC (LEI) staff help to answer questions such as:

How should tariffs be designed to insure cost recovery while meeting standards for equity efficiency?
What market structure best limits the exercise of strategic behavior among bidders?
Can market rules be designed to address power concerns without eliminating the incentive to invest?
What proportion of savings attributable to efficiency gains should go to shareholders v. ratepayers?
Should capacity markets be established, and if so, how should they be formed?
What conditions justify the imposition of explicit transmission congestion pricing regimes?

Whether advising on regulatory strategy for a network, or tariff design or market reform for a regulator, our ability to balance the needs of various stakeholder groups helps us to propose durable, long term, least cost solutions to difficult regulatory conundrums.

HOW WE CAN HELP

PERFORMANCE-BASED RATEMAKING (PBR): Our practice is anchored on our ability to quantify current and achievable efficiency levels for regulated industries, and to convert the findings into efficiency targets mutually acceptable to utilities and regulators. These abilities are supplemented by on-the-spot knowledge of how PBR regimes in the UK, Australia, Latin America, and elsewhere have evolved. For companies facing a PBR regime, we help to quantify the potential revenue at risk and the compensating possibility for upside. We also examine issues such as performance standards, cost of capital, and social protections.

ELECTRICITY MARKET DESIGN: We have extensive experience in coordinating input from stakeholder groups, and in developing the institutions necessary for day-to-day market operation. Our team has extensively studied "seam issues" between markets and developed potential solutions. From Chile to Australia, we are familiar with regulatory regimes, market design elements, and way rules can be improved.

REPRESENTATIVE ENGAGEMENTS

INDUSTRY STRUCTURE REVIEW: Our work for a Canadian provincial government examined the appropriate interaction and evolution of institutions for price formation, transmission operation, market surveillance, and management of residual obligations. We explored questions of governance, market power, conflict of interest, and transparency, and recommended a more efficient institutional framework for market development.

TRANSMISSION INVESTMENT MODELING: To internalize social benefits from transmission investment into the regulatory approvals process, we developed a detailed model for the California ISO incorporating the impact on generation market power and the effects of NIMBYism in determining the relative social value of various proposed transmission projects. Examining 196 scenarios, the model is a flexible and reliable analytical tool.

DESIGN OF SELF-FUNDING TARIFFS: For ISOs in New England and Australia, we have designed self-funding tariffs and assisted in regulatory filings supporting them. Tasks have included creating detailed financial models of cost causation and tariff incidence, managing stakeholder input interactions, segmenting fixed and variable elements, attributing the tariff between generation and load, and explaining the tariff to relevant public bodies.

DESIGN OF SELF-FUNDING TARIFFS: In Canada, Argentina, and the Caribbean, we have advised regulators on PBR design and on setting X-factors. Our comprehensive model of comparative network efficiency, including hundreds of international utilities, helps to benchmark efficiency levels for particular regions.

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EXPERT TESTIMONY & LITIGATION CONSULTING

London Economics International LLC (LEI) provided reliable testimony backed by strong empirical evidence. Our experts have been involved in market design, contract formulation, and asset valuation in power, water, natural gas, transportation, and other infrastructure sectors in countries around the world. This depth of knowledge makes them highly credible witnesses, as well as being able to provide complete and comprehensible briefings to counsel as the prepare their cases. LEI testimony and litigation consulting is supported by a suite of proprietary quantitative models and the firm's ability to construct intricate and accurate financial models quickly.

HOW WE CAN HELP

VALUATION QUESTIONS: Valuation required an understanding of revenues, appropriate discount rates, alternative uses for assets, and accounting and taxation issues. LEI has the appropriate tools to perform both forecasting and backcasting, quickly providing revenue projections under a variety of scenarios. Experience in a wide range of valuation and acquisition exercises has provided us with in depth exposure to key accounting and tax issues.

CONTRACT DISPUTES: LEI staff have been asked to opine on the reasonableness of specific terms, whether specific terms are common industry practice, and whether or not force majeure or contract breakage clauses have been triggered appropriately.

MARKET POWER AND STRATEGIC BEHAVIOR: LEI has exhaustively examined questions of market definition in wholesale and retail electricity and natural gas markets. We have created proprietary game theoretic models to show the extent to which players can influence prices. In addition, we have analyzed short-run and long-run marginal costs in many industries to show when competitive market conditions can be said to exist, and have also delved into the question of linked product markets, such as capacity, ancillary services, and energy market in electricity.

IMPLICATIONS OF MARKET DESIGN PROPOSALS: We have participated in the design of electricity and natural gas markets across North and South America, the UK, and Australia. Our direct experience in market design enables us to testify and advise on market design flaws, market behavior during periods of system stress, market gaming, and governance and market surveillance issues.

REPRESENTATIVE ENGAGEMENTS

ESTIMATION OF DAMAGES IN DISPUTE OVER SALE OF ASIAN IPP: In a case involving allegedly undisclosed contract modifications at the time of sale, LEI performed an independent investigation of possible damages. Testimony included detailed modeling of future offtake under the contracts, pricing regimes, the implications of electricity market restructuring, identification of an appropriate cost of capita, and examination of concession agreements.

STATISTICAL SUPPORT FOR MATERIAL ADVERSE CHANGE EVENT: For a client seeking contract termination over a material adverse change occurring due to an adjustment in the calculation of a related price index, LEI reviewed changes in the relevant market's rules; assembled a comprehensive set of data on fuel prices, plant outages, load patterns, and operation dynamics; and performed sophisticated statistical modeling including ARCH and GARCH models to demonstrate that an adverse change had occurred.

TESTIMONY REGARDING RULES TO MINIMIZE STRATEGIC BEHAVIOR IN ELECTRICITY MARKETS: Drawing upon detailed knowledge of economic theory, behavior or market participants, and experience in other markets, LEI was able to demonstrate that proposed rules would have a significant negative impact on new generation investment, ultimately increasing prices to final consumers.

SUBMISSION OF TESTIMONY REGARDING SELF-FUNDING TARIFF: LEI helped the northeastern ISO to design a self-funding tariff, and supported the client in preparing testimony regarding the tariff. We provided extensive financial modeling to show the impact on various stakeholders, how cost categories and billing determinants would change over time, and reflect, where possible, cost causation.

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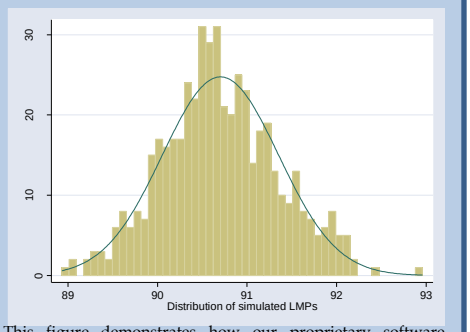
TRANSMISSION

London Economics International LLC (LEI) has an extensive array of experience creating integrated wholesale electricity market simulations to identify beneficiaries and quantify the costs and benefits from proposed transmission lines. In addition to our array of proprietary quantitative models, LEI's staff has in depth industry experience across North America, with a strong focus on the United States and Canada. LEI's also has testified for state policymakers, regulators, and siting organizations on transmission rate-setting, and transmission policy design.

HOW WE CAN HELP

VALUING TRANMISSION: LEI combines fundamental economic and statistical analytical expertise with an exhaustive knowledge of electricity markets to create meaningful simulations of investment impact using a suite of proprietary integrated wholesale electricity models. Our Valuation of Transmission Augmentation Links (ViTAL) modeling framework was specifically designed for regulators and transmission system owners and operators. Other tools employed in our cost-benefit analysis include our network simulation model, PoolMOD which is used to forecast electricity prices and quantify benefits of new transmission capacity (see figure). In addition, LEI provides advice and analysis related to the valuation of congestion contracts across North America using real options coupled with PoolMOD.

Fig 1: Distribution of simulated energy prices



This figure demonstrates how our proprietary software PoolMOD is capable of creating a distribution of energy market prices based on slight changes in the availability of plants. Therefore our simulations provide robust results against many different system environments which is crucial to measuring the impact of transmission lines accurately. Furthermore it provides a range of potential benefits that also allow for the use of objective statistical methods.

TRANSMISSION TARIFF DESIGN: LEI has significant global experience in analyzing transmission market rules and developing new transmission tariffs, assessing demand elasticity, and undertaking comprehensive market analysis for transmission companies and regulators.

PROCUREMENT PROCESS AND CONTRACT DESIGN: LEI applies fundamental economic principles and an exhaustive knowledge of electricity markets to help governments, regulators, and private companies create effective, rational, and transparent procurement processes including competitive solicitations for transmission capacity. LEI's support for procurement processes includes proposing selection criteria, drafting contracts, publicizing the procurement, communicating with stakeholders, monitoring the opening and examination of bids, creation of an analytic and modeling framework to evaluate bids.

RELEVANT ENGAGEMENTS

COST BENEFIT ANALYSIS OF NEW REGIONAL TRANSMISSION PROJECT: Developed wholesale market simulations in order to compare the potential benefits which would accrue to ratepayers between the investment in additional transmission or generation capacity within a constrained area of New England. In addition, we created a distribution of benefits to support the robustness of our findings.

VALUING TRANSMISSION RIGHTS: LEI conducted a first-stage of a proposed new transmission line between the Midwest and Canada and the value of transmission rights (TRs). Revenues associated with the sale of TRs were forecasted and compared against the estimated costs of the project to arrive at an estimate of the net present value of the project and return on investment.

TRANSMISSION TARIFF DESIGN: LEI advised a utility in tariff design, assessed allowed ROE, proposed strategy for cost-of-service incentive rates design and other cost of capital components project, built tariff models, as well as testified on tariff making principles for transmission.

PROCUREMENT PROCESS AND CONTRACT DESIGN: LEI worked on a transmission open season auction for a regulator. LEI designed and drafted the RFP process, RFP documentation, and contract template in order to best meet the needs of our clients. LEI also managed the procurement process, and evaluated project bids.

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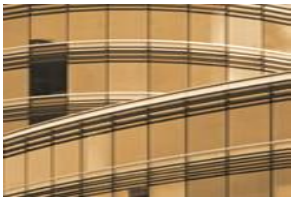

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RENEWABLE ENERGY

London Economics International LLC (LEI) has extensive experience related to renewable energy policy design and asset valuation. Below, we briefly describe our capabilities in five main areas: procurement, modeling, wind, biomass, and small hydro. This renewables capabilities briefing sheet is not intended to be exhaustive; LEI has worked on a range of renewables related topics, including but not limited to solar, demand response, energy efficiency, cogeneration, micro-grids, energy storage technologies, and emissions credit trading. LEI analysis has appeared in offering documents associated with renewable energy projects, and is supported by LEI's overall market modeling and regulatory expertise.

HOW WE CAN HELP

RENEWABLES PROCUREMENT AND POLICY: LEI has experience both working with state and provincial authorities in the design of renewables procurement initiatives and with clients crafting their responses to solicitations. The firm has examined or helped design renewables procurement efforts in Connecticut, Kentucky, Maine, the Pacific Northwest, and several Canadian provinces, addressing such issues as contract length, eligibility requirements, and pricing. In Saudi Arabia, LEI has helped to draft the National Renewable Energy Policy. In Ontario, LEI assessed the costs of the Green Energy Act. Respondents to renewables procurement initiatives assisted by LEI include cogeneration, small hydro, and biomass producers.

REC AND ERC MODELING: As part of its suite of proprietary market modeling tools, LEI has created a model to provide forecasts of renewable energy credit (REC) pricing in various North American regions. The model marries an up-to-date understanding of current REC eligibility rules with current and projected renewable resource capacity by type to produce state specific projected REC pricing. With regards to emissions credits, whether for carbon dioxide under the Regional Greenhouse Gas Initiative, or existing sulfur dioxide and nitrous oxide regulations, LEI has created a module in its energy and capacity price forecasting models which considers emissions reduction credit (ERC) prices and their impact on both marginal production costs and capital expenditure decisions.

WIND: For investors and developers of wind projects, LEI has forecast revenues under a variety of market, REC pricing, and wind scenarios. LEI forecasts and market analysis have been incorporated into offering memoranda and used to underpin board level decision making processes. LEI is also familiar with the use of Monte Carlo and bootstrapped techniques to provide greater depth to modeled revenue outcomes associated with wind plants. The firm has also advised developers of energy storage devices intended to be paired with wind projects.

BIOMASS: LEI's biomass-related experience extends across the value chain, including fuel supply, PPA negotiation, assessment of operating contracts, and project valuation. LEI has provided asset management services for a private equity firm focused on biomass acquisitions, as well as expert testimony on behalf of a biomass project developer. Location of biomass projects assessed has included the Northeast, California, Hawaii, and Canada. LEI has compared numerous fuel contracts and fuel types, examined restart and retrofit programs, and managed biomass construction projects. The firm is knowledgeable about the impact of state and Federal incentive programs, such as production tax credits, on the underlying economics of biomass projects.

SMALL HYDRO: For small hydro projects, LEI has performed a range of economic assessment tasks. The firm has assisted in providing market analysis used to support financing. Such engagements have involved projecting market revenues from energy, capacity, and RECs under multiple market and production scenarios. LEI has also marketed RECs and output from small hydro projects on behalf of existing owners, obtaining bids and negotiating PPAs. Additional tasks have included examining and negotiating operating contracts, reviewing FERC compliance, and seeking project synergies. LEI has also assisted in examining and comparing the economic impact of differing financing proposals for small hydros.

SOLAR: For solar projects, LEI has performed financial modeling, review of incentive regimes, comparison of manufacturers, and negotiation of underlying contracts. LEI has reviewed isolation factors around the world and created a matrix of environmental and incentive conditions to pinpoint the most favorable regimes.

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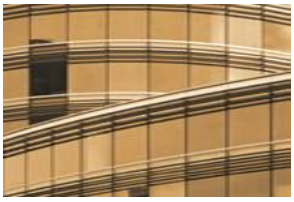

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PROCUREMENT

London Economics International LLC (LEI) has an extensive array of experience designing, administering, monitoring, and evaluating competitive procurement processes. As competitive solicitations for energy and energy related products quickly become the norm, regulators and utilities alike face increased pressure to ensure that economic principles and best practices are adhered to. At LEI, we have over twenty years of experience modeling and analyzing energy markets around the world. Our proprietary suite of analytical tools enables us to understand the impact of investment decisions and determine least-cost alternatives. Our leading team of economic, financial, and technical experts have a specialized knowledge of competitive procurement processes and have testified before local regulators, as well as the Federal Energy Regulatory Commission, on competitive procurement, market design fundamentals, and market power related issues.

HOW WE CAN HELP

PROCUREMENT PROCESS AND CONTRACT DESIGN: LEI applies fundamental economic principles and an exhaustive knowledge of electricity markets to help regulators and utilities create effective, rational, and transparent procurement processes. LEI's support includes proposing selection criteria, drafting RFP documents and templates, publicizing the procurement, communicating with stakeholders, the creation of an analytic framework to evaluate bids, and development of supporting models to compare various options proposed.

INDEPENDENT MONITORING AND EVALUATION: As an independent monitor, LEI reviews and assesses the solicitation framework, documents, and modeling methodologies to ensure the process is designed to achieve a fair and unbiased result. LEI also monitors, audits, and validates the bid process and opines on the fairness of the ultimate result.

RELEVANT ENGAGEMENTS

RFP DESIGN AND IMPLEMENTATION: LEI acted as advisor to the Connecticut Department of Public Utility Control (CT DPUC) during its all-source energy procurement. LEI developed a "Needs Assessment" to determine the quantity of capacity necessary to satisfy the State's Locational Forward Reserve Market requirements. LEI's procurement specialists designed the RFP framework and managed the day-to-day activities, including the collection of bids and the evaluation of submissions relative to anticipated market outcomes. LEI experts testified as to the merits of the selected projects that were awarded long-term contracts. LEI also recently performed a similar role, designing the RPF documents and evaluating bids, for the Maine Public Utilities Commission's 2009 procurement.

CONTRACT DESIGN: LEI has a longstanding history of expertise when it comes to the design and evaluation of energy related contracts. Recently, for the CT DPUC, LEI designed a power purchase agreement incorporating a hybrid physical and financial structure. For the Ontario Power Authority, LEI advised on the design of peaking incentive mechanisms in hydro-electric generation contracts.

MONITORING AND EVALUATION: LEI experts have served as independent monitors (IM) on a number of competitive procurement processes. Most recently, LEI was the IM for PacifiCorp's renewable energy procurement process. LEI reviewed the solicitation framework, documents, and modeling methodologies and monitored and audited the bid evaluation process. In Connecticut, LEI staff acted in a similar role, monitoring Connecticut Light & Power's transitional standard offer auction. LEI also actively monitors outcomes in default supply, standard offer ,and provider of last resort bid processes for private investors.

BEST PRACTICES IN GENERATION PROCUREMENT: Having contributed to competitive procurements in multiple jurisdictions, LEI has a comprehensive understanding of best-practices. LEI staff have testified before the California Energy Commission on the benefits of competitive solicitations, and have led a number of stakeholder engagement sessions, including for the Ontario Power Authority, aimed at improving RFP design.

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QUANTITATIVE MODELING TOOLS

London Economics International LLC (LEI) develops custom modeling approaches to capture the nuances of individual power markets, using as a foundation several key tools: production cost modeling using our proprietary POOLMod software; game theoretic modeling using CUSTOMBid, which is also proprietary; real options modeling using a modified Black-Scholes approach; and Monte Carlo simulation. We also model related markets such as those for capacity, ancillary services, or emissions credits.

POOLMOD uses merit order stacks based on marginal cost calculations to schedule and dispatch plants, incorporating algorithms that consider issues such as maintenance scheduling, dynamic constrains, and daily reserve margins. POOLMod simulates dispatch of system resources on a half-hour basis for every day of the year, for up to 25 years, dispatching individual plants to meet projected regional load and reserve requirements.

POOLMod simulates least cost dispatch of power plants

WHAT IT IS USED FOR:

- wholesale power price forecasting
- competitive plant & contract valuation
- emission credit market analysis
- transmission congestion cost estimation

CUSTOMBID helps market participants and regulators move beyond market share calculations as an indicator of market power to an approach which focuses on the composition of plant portfolios and the ability of the owners of those portfolios to sustain bidding above marginal cost.

CUSTOMBid analyzes strategic behavior in wholesale power markets

WHAT IT IS USED FOR:

- power plant & contract valuation
- design of strategic portfolios
- detection of abuse of market power

REAL OPTIONS are an important tool in the financial valuation of generation assets, especially peaking plant and hydro-electric generators. Traditional valuation procedures, such as discounted cash flow analysis, ignore the value of managerial flexibility. These models do not capture the value embodies in the plant operator's ability to react to changing market conditions; the Real Options methodology measures the value inherent in such adaptability. Real Options, like financial options, have five components: value of asset, exercise or strike price, time to expiration, volatility, and risk-free rate. Our options pricing model for generation is based on the sparks-spread principle: a plant has the right, but not the obligation, to burn fuel and produce electricity, which it can then sell into the wholesale power market.

Real Options quantify the costs/benefits of operational flexibility

WHAT IT IS USED FOR:

- valuation of peaking power plants
- developing turbine procurement inventory strategies
- assessment of site value

MONTE CARLO simulation is a useful technique for discovering the relationships of variables and outcomes under uncertainty. In a Monte Carlo simulation, key variables in a model are assigned probability distribution, and correlations may be established between variables.

Monte Carlo identifies the impact of expected variation in input assumptions

WHAT IT IS USED FOR:

- modeling the impacts of hydrological price variation
- useful in markets with significant hydroelectric capacity
- modeling the sensitivity of financial results to uncertainty in input variables

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