Efficient and Reliable Generation Asset Valuation

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Presentation Outline

- Steps involved in Generation Asset Valuation
- Tools Needed
- A Case Study

Asset Valuation Process

- Forecast and analyze current and future market fundamentals, i.e, supply and demand (& transmission), and regulatory environment
- Forecast forward revenues and costs
- Capture the volatility of the market and the optionality value
- Discount the future cash flow to today's dollars and determine the value of the project

Tools Needed

- Database of all supply, demand and transmission elements, and market and regulatory structure
- A tool to forecast revenues and costs including transmission costs (i.e., MAPS)
- A tool to incorporate the volatility of the market into the forecasted net revenues (i.e., Randomizer)
- A financial model to determine the net present value of the volatile cash flow

The Market Database

- Supply: All generation assets with their characteristics (heat rates, startup cost, capacity, etc..), hydro units, environmental costs, and fuel prices
- Demand: Hourly load forecast on zonal basis (peak and energy), interruptible demand
- Transmission: Transmission system elements and constraints (RMR, Second contingency, PARs, etc..)

The Market Database (cont.)

- Market structure: ISO with LMP, multi-settlement system, interconnection to other systems, ICAP requirement and market
- Ancillary services market: Spinning and non-spinning reserves, AGC market and other non-market services

SCD & LMP Forecaster

- Dispatch generation resources to meet demand subject to transmission and reliability constraints; mimic the ISO procedures
- Calculate locational market clearing prices for energy and other ancillary services

Randomizer

- Capture Electric Power Markets local volatility and price probability distribution
- Capture fuel price volatility and transmission cost volatility
- Capture the true/physical characteristics of generation assets (not a simple spread option)

Financial Model

- Simple Discounted Cash Flow model with all taxes, depreciation, operating costs and revenues from all markets (energy, capacity and ancillary services)

Case Study

- We used the above approach to value a set of three Generation Assets

Net Present Value of a Portfolio of Generation Assets in NY ($ Millions)				
Size (MW)	Type	Using MAPS	MAPS with Optionality*	Percent Increase
101	Combined Cycle Gas/Oil	18	25	39%
53	Steam Coal	17	20	20%
95	Combined Cycle Gas/Oil	28	36	30%
Total		62	81	30%

*Optionality value Using Historical Locational Volatility levels

- These assets were sold for $61 Million (compare to what it would have been a year ago)

Conclusions

- First, accurate valuation can be achieved using detailed market models and valid assumptions
- The market is back to the fundamentals
- Optionality value of generation assets is much more difficult to assess (future volatility estimate is the key)