

Content

This 2-day course is specifically designed to expand participants' knowledge of modeling a power generation capacity. Therefore it covers know how and will optimize skills with respect to outright options (mainly exotic) and the real option approach.

During delivery of the program attention is given to power generation capacity and their characteristics (engineering and legal obligations), hedging future cash flows of assets, optimization of the hedging process, flexibility, pricing of options, valuation of real options and Greek variables as indicators for sensitivities.

Although the course is about modelling and the fact that statistics are important in that field of expertise, and even although a bit of mathematics is incorporated, in this course things are brought forward in a way that everybody is able to understand. This however does not effect the level of the course in a negative way, but moreover allows for taking all subject even more in-depth than you can imagine.

Learning objectives

Acquiring insight and knowledge of:

- Power plants, their characteristics and the consequences of such for modeling
- Option & options theory
- Options valuation & valuation of power plants
- Hedging of power plants & Lock-in structures
- Scenario analysis
- Sensitivity analysis of cash flows
- Greeks variables of a spark/dark spread option

Level & Prerequisites

Mercurious guarantees a very interactive, practical and hands-on three days, full of examples, cases and exercises. Participants are required to participate actively and thereby we stimulate the learning curve optimally.

There are no prerequisites to attend. In other words, you don't need any basic knowledge (although basic knowledge about options is helpful), and still you'll manage to take it into depth. Mercurious is responsible for the guidance and helps you dealing with these challenges.

Option Fundamentals

- Call & put options
 - Premium
 - Strike price
 - Options style
 - American, European & Asian Style, and more
 - Plain vanilla versus Exotic options
- Options
 - Outright options
 - Embedded options
 - Real options
- Flexibility as option
 - 1-sided right vs. 2-sided obligation
 - The real options approach

Exotic options & their characteristics

- Path-dependent options
- Barrier options
- Binary options
- Compound options
- Forward start options
- Cliquet options

Option valuation

- Valuation models
 - Black & Scholes
 - Binomial models
 - Trees
- Disadvantages of models
 - Assumptions do not represent real life
- Skew
 - Skewness Tail risk
 - Volatility smile
 - Positive / Negative skew
- Kurtosis
 - Lepto-kurtosis
 - Height of the mean
- Impact on options premiums
 - Volatility curve & smile

Exercises

- Option value via binomial tree
- Premium with normal distribution
- Premium with log-normal distribution
- Option value with skew

Power plants as real options

- Power plants as sequence of call options on the spark spread
- Asset-backed trading
 - SS optimization
 - Delta hedging
 - Strategy to lock in
 - Dynamic hedging
 - Objective approach
 - Subjective approach
 - Under/over-hedging
 - Value of real option
 - Time value
 - Intrinsic value
 - Volatility of SS

Exercise

Model power plants as real options. What option type(s)? How many? What strike price? What maturity? Premium?

Greek variables & Managing Greeks in large portfolios

- Sensitivity analysis
 - Delta
 - Gamma
 - Vega
 - Theta
 - Rho
- Scenario vs sensitivity analysis
- Combined reporting - Matrix

Simulation

Trading options & managing flexibility in portfolios

- Overview of all Greeks
- Combining this overview with scenario analysis
- Steering exposures by doing transactions
- What deals are required or preferable?

Exercise

Greeks management for an energy portfolio of an energy producer.