

# 2-DAYS “ENERGY OPTIONS”

## OUTRIGHT, EMBEDDED & REAL OPTIONS

During this course you'll encounter outright options, as well as contractual embedded optionalities (embedded options), and the real option approach (ROA) is applied to physical assets. Clearly, valuation models will be covered and risk management of portfolios is included. Considered are diverse option strategies, hedging techniques, locking in future cash flows of physical assets, the risk management of complex supply contracts, and the management of options portfolios. The goal of the training is to provide insight in the way option work and how options (or the option theory) can be applied to positions of market participants who operate in the energy markets, amongst which are embedded optionalities (structures) in sourcing & sales contracts. Attendees will be shown combinations of scenario analysis and sensitivity analysis in one small matrix.

### Target groups

The course provides participants insight in trading mechanisms and triggers. This means that this workshop is therefore not only applicable to those who are active in the Front or Mid Office as trader or risk manager, but can also be allocated by others to master what actually takes place in the trading environment. And that is why we also welcome others who work in the trading environment, ranging from board members, project managers, legal staff, treasury management, ICT staff, back office employees, sales personnel, finance specialists, controllers and compliance officers. Next, accountants, legal experts, regulators, consultants and ICT specialists are also more than welcome to learn how companies manage their portfolio.

### Level & Prerequisites

Mercurious guarantees a very interactive, practical and hands-on two 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, and still you'll manage to take it into depth. Basic know how regarding options however is convenient, but -as stated- not a must. Mercurious is happy to be responsible for your success and has proven many time to serve as guidance for participants. This will help you to deal with related challenges.

### DAY 1

#### OUTRIGHT OPTIONS

The 1<sup>st</sup> day you'll become familiar with outright options, option strategies, hedging with options, option pricing and the impact of volatility on the option premium.

#### OPTIONS

*What are options? Which types are available in the markets?*

→ **Exercise: Calls & puts on fuels, power & carbon**

#### OPTION STRATEGIES

*What strategies can be set up with options?*

→ **Exercise: Time spread, location spread, spark spread**

#### HEDGING WITH OPTIONS

*How can energy portfolios be hedged with options?*

→ **Creating floors, caps & collars.**

#### OPTION PRICING

*How are options priced? What factors influence the option premium?*

→ **Exercise: Black & Scholes + Binomial valuation model**

#### VOLATILITY

*How does volatility impact option premiums? How can standard option pricing models be adjusted for energy?*

#### EMBEDDED OPTIONS & SUPPLY CONTRACTS

In this session you will analyze embedded options which are incorporated in energy sourcing & sales contracts, within organizations or with the outside world.

#### FLEXIBILITY

*What is validity premium (paid by sales department to trading department) incorporated in energy sales contract prices? What is a click option?*

→ **Exercise: Validity period of a proposal. Decision time relates to price risk (level & volatility).**

#### OPTIONALITY

*What is liquidity premium incorporated in energy sales contract prices?*

→ **Exercise: Internal transfer pricing mechanisms contain optionalities.**

#### SWING OPTIONS & VOLUME FLEXIBILITY

*What is the risk related to energy sales contracts? And how should these risks be managed? What are swing options and flex options? How can they be optimized?*

→ **Exercise: Volume risk (delivery risk), swing options, price risk, Delta hedging.**

### DAY 2

#### REAL OPTIONS & PORTFOLIO MANAGEMENT

In this session you will apply the real option approach to physical assets and manage associated risks.

#### THE REAL OPTIONS APPROACH

*Business decisions: An option to start, stop, defer, expand, or contract.*

#### PRODUCTION CAPACITY

*How can oil & gas production fields, coal mines and power plants be considered as options?*

→ **Exercise: Model a gas-fired power plant according to the real option theory.**

#### STORAGE CAPACITY

*How to model gas/oil storage capacity? What are the consequences of such? What are the disadvantages of such?*

→ **Exercise: Optimization of gas storage capacity.**

#### TRANSPORT CAPACITY

*How does the option theory help to value and hedge transport or transmission capacity?*

#### PORTFOLIO/RISK MANAGEMENT & GREEK VARIABLES

*How are options portfolios managed? What are the Greek variables? How are these influenced?*

*How sensitive is the value of your energy portfolio (including your power plants, transport capacity, and gas storages) to changes in prices of fuels and electricity, and to changes in interest rates, and to changes in volatility, and to time passing by? And what about the dynamics of these factors over time?*

→ **Exercise: Delta, Gamma, Vega, Theta and Rho.**