



Training Course

Amsterdam, March 2017

Power Generation Valuation & Hedging

Course Highlights

- Insights into power plant valuation approaches
- Influence of renewables on the power market and on plant value
- Principles of delta hedging, and implementation of hedge strategies

KYOS Energy Consulting BV
Nieuwe Gracht 49
2011 ND Haarlem
The Netherlands
+31 23 5510 221
info@kyos.com
www.kyos.com

Course description

KYOS organizes a 2-day course on valuation and hedging of power generation assets. The course provides an in-depth understanding of methodologies to value and manage generation assets and power contracts. The course mainly covers thermal plants, but also contains separate discussion of renewable assets, and power plant contracts.

With real life examples and cases studies the course participants get practical experience to properly value and manage power plants, taking into account relevant technical and commercial plant constraints. Furthermore, the course shows how to construct realistic price scenarios, a key element for valuation and hedging.

Who should attend

The course aims to attract a wide range of people active in the energy and financial sector, including energy traders, asset developers, portfolio and risk managers, energy market analysts, regulators and consultants. The course does not require any specific pre-knowledge. The instructors are used to present technical details in an intuitive manner, appealing to people with a quantitative and non-quantitative background.

Course leader

Cyriel de Jong has been working as an advisor for the energy industry since 2001. Until 2006, he combined this with a position at Erasmus University Rotterdam. For the major companies in Europe, Cyriel has led a great number of projects related to energy market valuation, risk management, trading strategies and investment analysis. He is particularly active in price modelling, financial methodologies to value energy assets and contracts, and in stochastic optimization.

Cyriel completed his MSc. in Econometrics at Maastricht University, and finished his Ph.D. on financial derivatives at Erasmus University Rotterdam in 2003.

Date and venue

The training course will take place in March 2017 in Hotel DoubleTree by Hilton, Oosterdoksstraat 4, 1011 DK Amsterdam, the Netherlands. The hotel is located next to Amsterdam Central Station.

How to register

<http://www.kyos.com/courses-events/power-generation-valuation-hedging/>

Session 1 – Introduction power plant valuation

- Technologies
- Explanation of costs
- Financial evaluation of power stations

Session 2 – How to build up the intrinsic value of a power plant

- Build-up of intrinsic value
 - What are typical constraints and optionalities?
 - Switching between min and max production
 - Switching between running on 1 and on 2 GT's
 - Start costs and start curves
 - Heat delivery, including boilers and heat buffers
- Main methodologies to create HPFCs as the basis for an intrinsic valuation
- Impact of renewables on power market
 - Surge in wind power: impact on pricing
 - Solar power: impact on peak power price
 - How to model the impact of renewable growth on future HPFC's

Session 3 – Valuation of spread options: power plant, cross-border capacity

- From intrinsic to extrinsic value
- Treating the power plant as a strip of options
- Application of the Margrabe's/Kirk formulas for spread options (power plant as spread option)
- Comparing and assessing optionality in:
 - Forward markets
 - Spot markets (day ahead)
 - Intra-day markets
 - Balancing markets
- Other spread options: cross-border capacity

Session 4 – Monte Carlo price simulations and cointegration

- Volatility term structure
- Cointegration versus correlation
- Effective simulation of spark and dark spreads
- Impact cointegration on power plant value

Registration
8:30 – 9:00

Training Course
9:00-17:00

Lunch
12:30-13:30

Day 2

Training Course
9:00-17:00

Lunch
12:30-13:30

Session 5 – Dispatch Optimization

- Plant constraints: technical, commercial, environmental
- Explanation of different plant dispatch optimization approaches: Mixed Integer Linear Programming (MILP), dynamic programming (DP), least-squares Monte Carlo (LSMC)
- The impact of uncertainty on dispatch decisions
 - Short-term and long-term optionalities and uncertainty
- Optimization of a portfolio of power plants:
 - Why can it be relevant? Common heat delivery or production obligations, imbalance markets.
 - Implications for plant dispatch optimization and valuation

Session 6 – Power plant hedging

- Purpose of hedging (risk reduction, profit optimization)
- Delta, gamma, vega: what do the Greeks mean and how can they be used by trading?
- Spread option formula to derive approximations of the option Greeks
- Shock-based calculation of option Greeks (finite-difference)
- Implementing delta hedging strategies in practice:
 - Intrinsic hedging versus delta hedging
 - Evaluating the pay-off of hedging strategies
 - Hedging costs and re-hedge frequency
 - Hedging in imperfect markets
 - Hedging long-term versus short-term price risks
 - Setting up a hedging policy

Session 7 – Evaluating renewable investments

- Different incentive schemes for renewables and impact on the investment risk
- Influence of wind and solar production on market prices: produce when prices are low
- Who is going to provide future flexibility for the power market and how will this be paid for?

Session 8 – Energy Trading Game