

BULGARIA POWER SECTOR: MAKING THE TRANSITION TO FINANCIAL RECOVERY AND MARKET LIBERALIZATION

CONTRACT FOR DIFFERENCE



THE WORLD BANK

IBRD • IDA | WORLD BANK GROUP

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Agenda

Contract for Difference (CfD) overview

CfD calibration

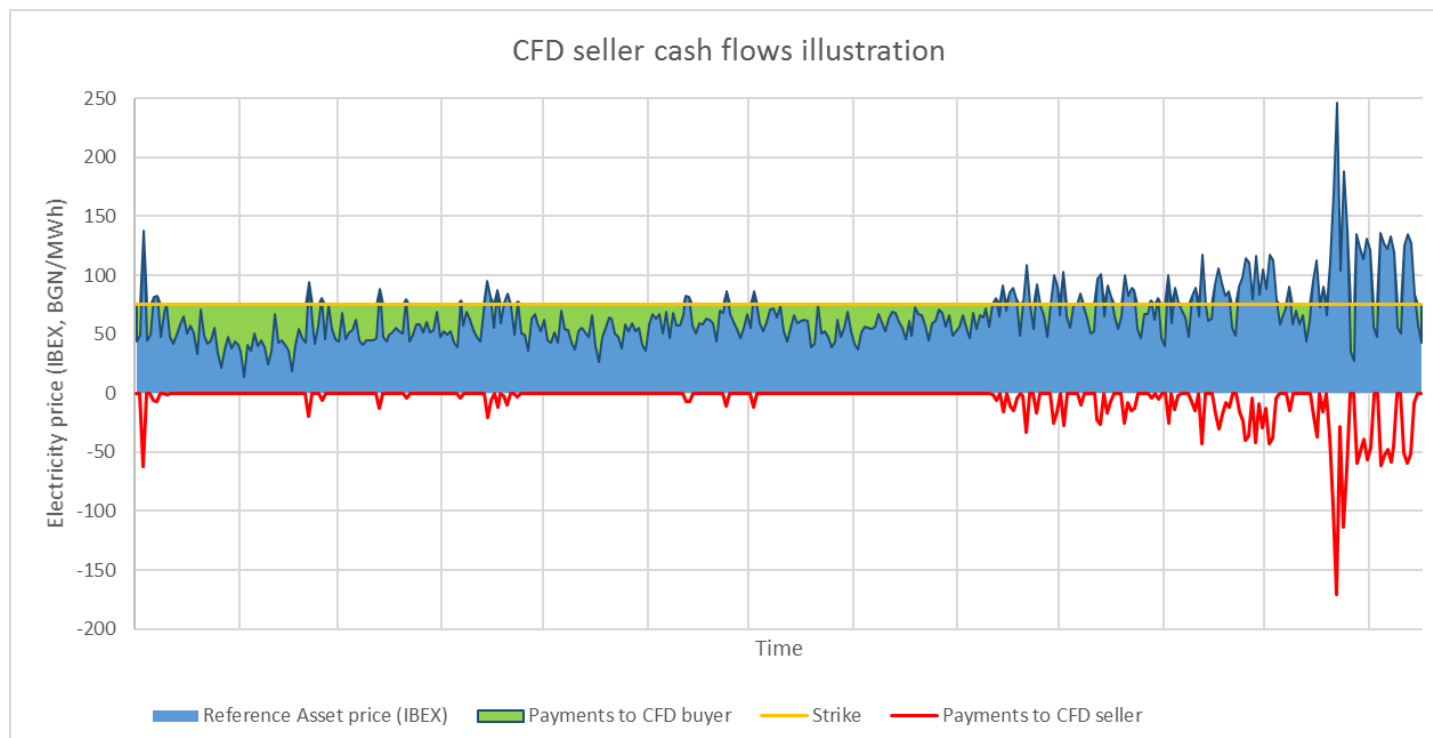
The Security Fund and the role of CfD for Suppliers

Contract for Difference

CfD overview

What is a Contract for Difference?

Contract For Differences (CfD), is a financial contract between two parties that reduces exposure to volatile energy prices. At a pre-agreed frequency, the CfD seller will pay (receive) to (from) the CFD buyer the difference between the contracted price (strike) and the actual market price.

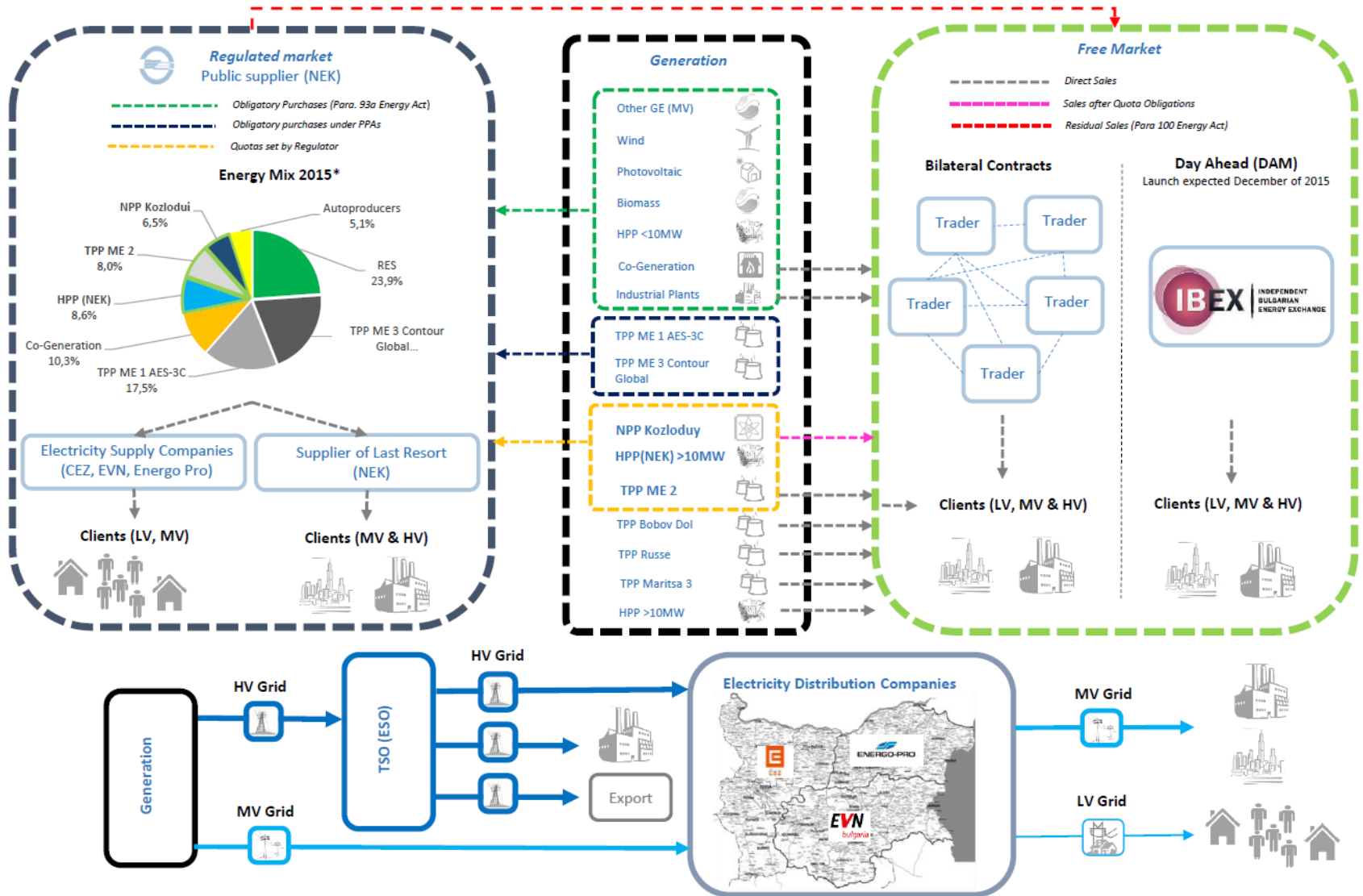


Source: World Bank, based on IBEX Day-Ahead Market

Contract For Difference (CfDs) as a financial tool

- Contracts For Difference (CfDs) is a very efficient tool to integrate and transition generators in an open market.
- A very flexible tool that allows all generators with contractual or legal obligation to be discussed individually and be included in the framework :
 - Substitute to Feed-in-Tariffs (FiTs) for renewables
 - e.g. Wind, Solar, Hydro, Biomass
 - Contracted Generators
 - e.g. District Heating
 - Independent Power Producers (IPPs)
 - Partial substitute to Power Purchase Agreements

Bulgarian Electricity Market Overview



* The Energy Mix for 2015 is based on reported figures for H1 2015 and figures for H2 2015 according to the new regulatory decision for the regulatory period August 2015 – June 2016

CfD's key design parameters

1. Counterparty

- A centralized counterparty for all CfD contracts
(a decentralized market is basically a forward market)
- Security Fund

2. Strike Price

- Consistent with existing contractual arrangements/regulatory framework

3. Reference Price

- Electricity price indexes representing market equilibrium level and dispatch/load profiles
- The reference will be indexes based on **IBEX day-ahead market** prices

4. Volume

- Usually based on a fixed quantity of electricity, volume could vary with years
- Consistent with actual and expected dispatch

CfD's key design parameters

5. Maturity

- The duration of CfD contract, consistent with existing contractual arrangements
- Could as well be different from existing agreements maturity, with the aim to organize a transition to a decentralized market

6. Settlement

- Financial vs physical settlement
- Objective is to minimize arbitrage opportunities
- Should make sure that CfD doesn't impact DAM market price (e.g. bid at marginal cost, final deliveries penalties)

➤ Impact on Market structure and looking forward

- Regulatory framework and arbitrage e.g. IBEX
- Regulated versus Free market

Contract for Difference

CfD calibration

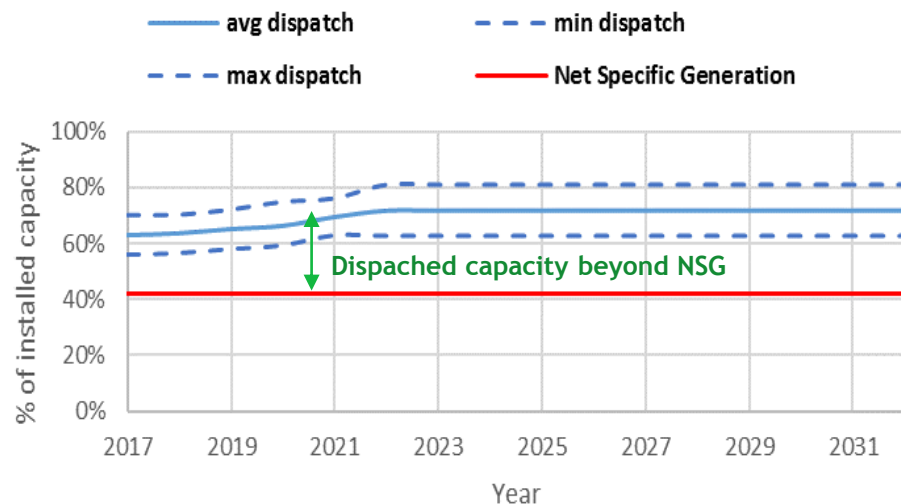
Example: RES producing more than the NSG

Select appropriate strike price and contract volume to try to make generators financially indifferent between FiT and CfD

Analyses here are based on sector level, however contracts need to be negotiated with each specific producer

- **Strike price** equal to Feed-in-Tariff
- **Volume** equals to **Net Specific Generation**
- Basis risk if generator's sales price not equal to CFD reference price
- A combination of a baseload and a peak-load reference can bring weighted reference price as closely to generator's sales price as possible

Dispatch Profile Example



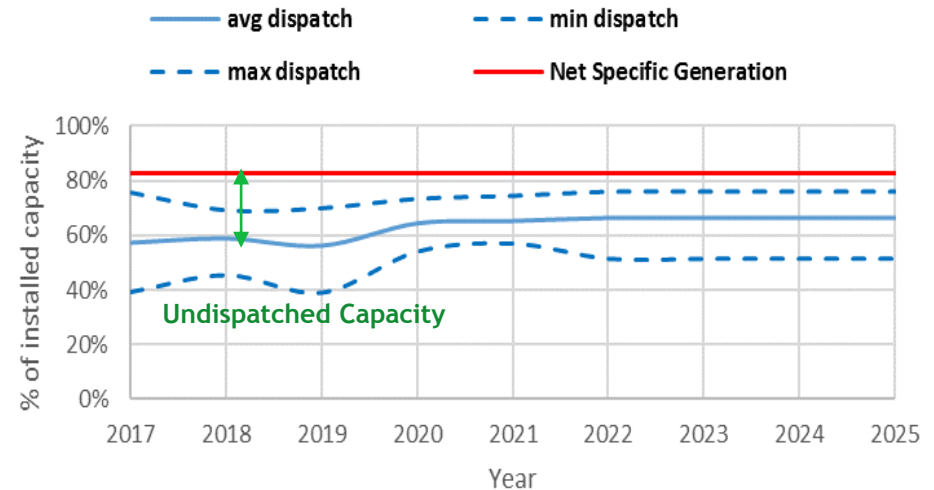
Example: RES producing less than the NSG

Select appropriate strike price and contract volume to try to make generators financially indifferent between FiT and CfD

Analyses here are based on sector level, however contracts need to be negotiated with each specific producer

- **Strike price** equal to Feed-in-Tariff
- **Volume** equals to **Expected Dispatch**
- Basis risk if generator's sales price not equal to CFD reference price
- A combination of a baseload and a peak-load reference can bring weighted reference price as closely to generator's sales price as possible

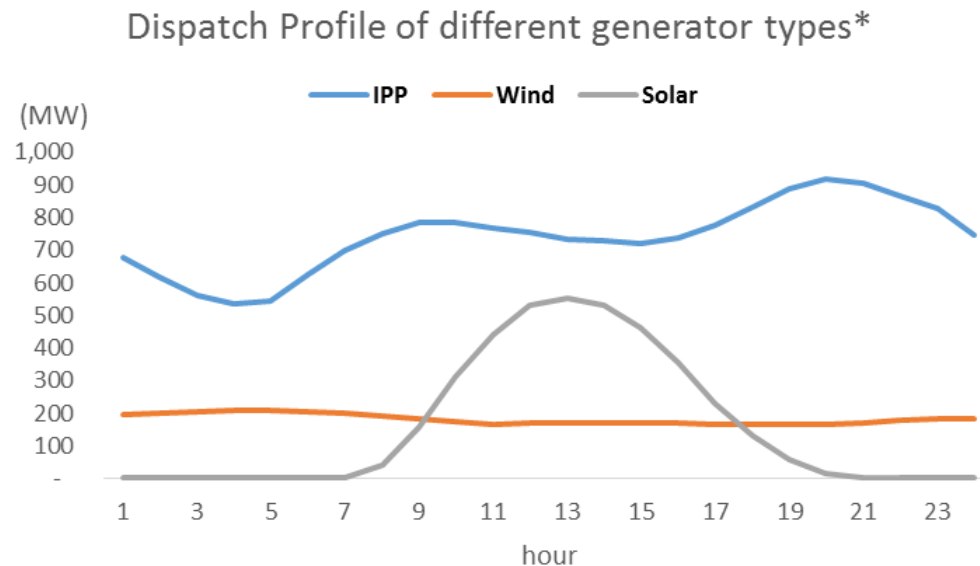
Dispatch Profile Example



How to better adapt the dispatch profile of different generators?

Dispatch profile differs by generator types

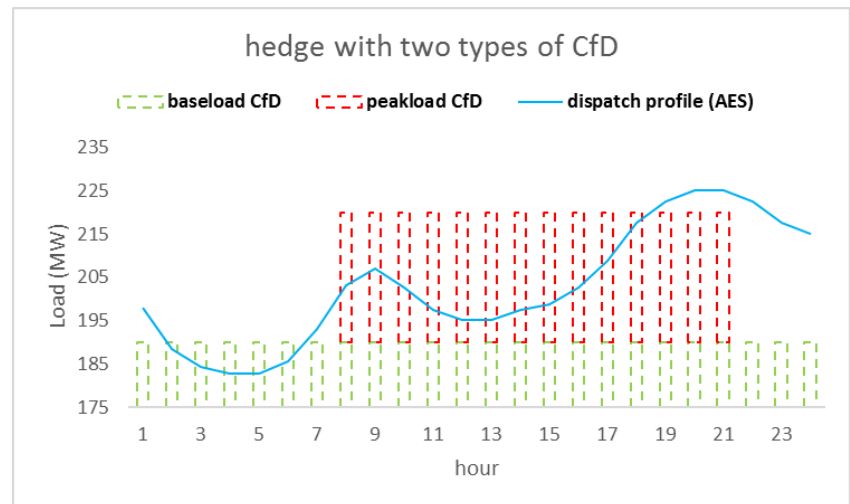
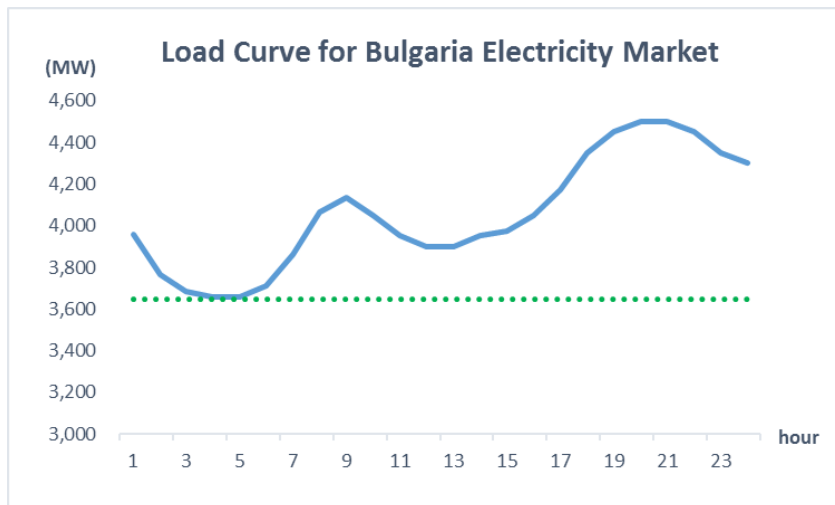
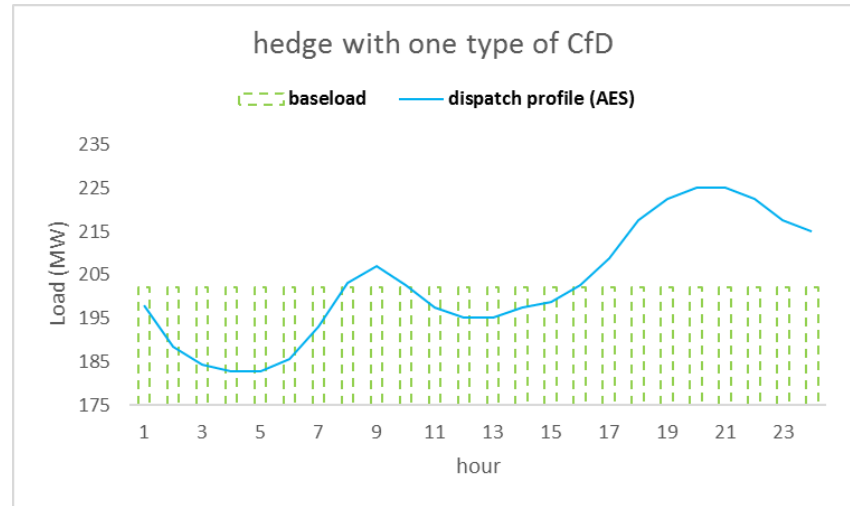
- IPP, Hydro, Biomass, DH: mostly baseload
- Solar: during day time, usually coincides with peak in demand
- Wind: more difficult to predict, peak in production usually coincides with lower demand



**Based on dispatch model output*

How to better fit the seasonality of the load profile?

- Load profile is not constant
- Price is set hourly on the DAM
- Basis risk
- Several CfDs, with different reference prices, can better replicate various load profiles
 - ✓ Base v.s. Peak
 - ✓ Winter v.s. Summer
 - ✓ Weekday v.s. Weekend



Contract for Difference

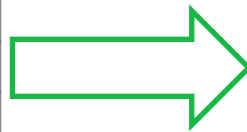
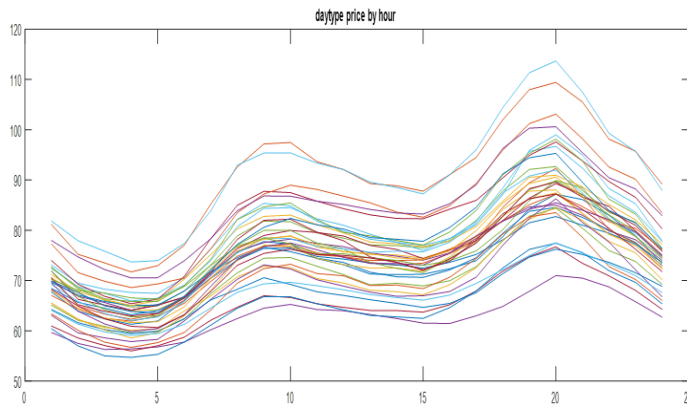
The Security Fund and the role of CfD for Suppliers

Security Fund

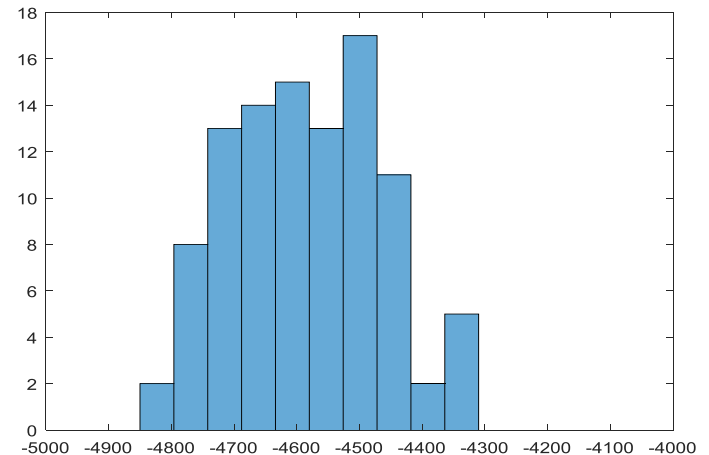
The role of the Security Fund and the importance of risk management:

- Open exposure to electricity prices
- Assessing the risks of the financial position: budgeting, cash-flow analysis, sensitivity/scenario analysis
- Hedging solutions for the Security Fund e.g. CfDs with Suppliers

Different simulation paths



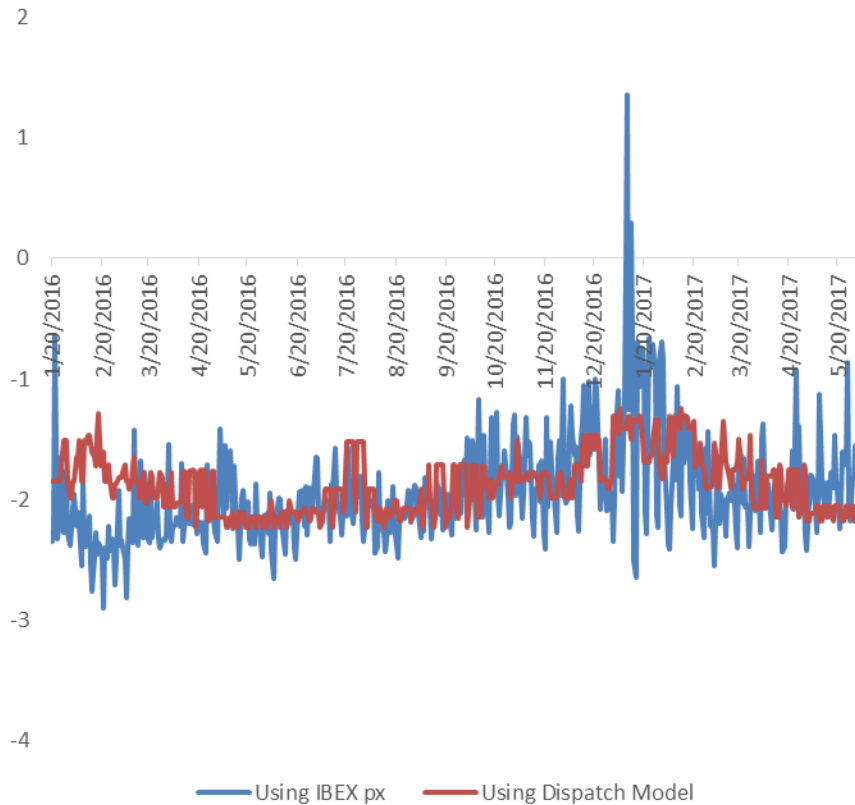
Distribution of Security Fund NPV



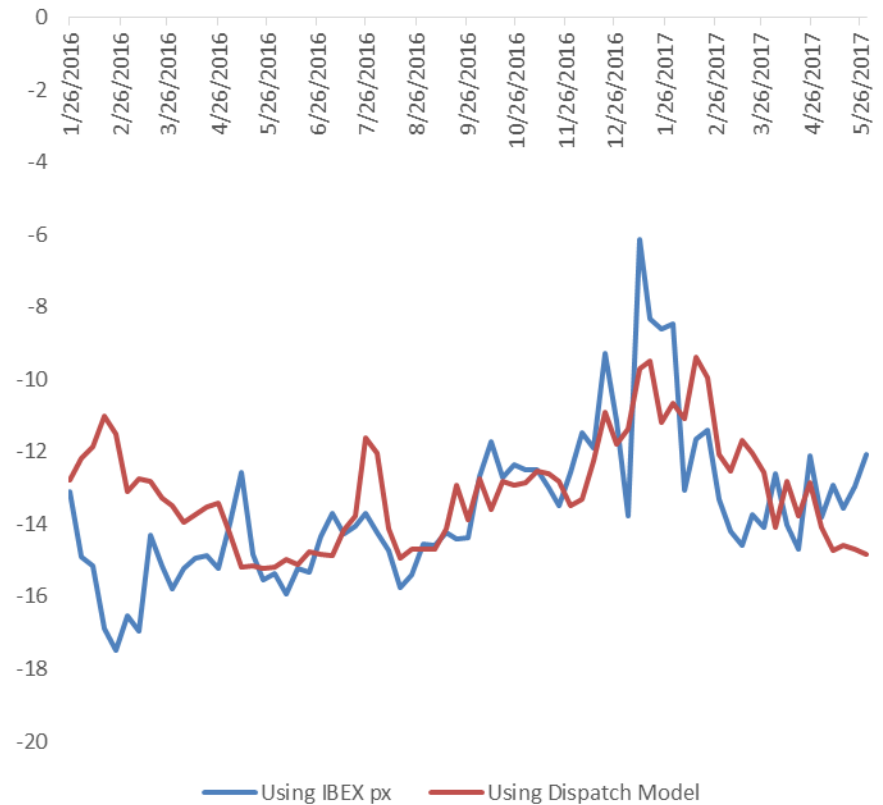
Cash-flow Analysis for the Security Fund

Simulation of cash-flows using historical IBEX and dispatch model prices

Security Fund Daily Cash-flow Simulation



Security Fund Weekly Cash-flow Simulation



Security Fund – How to manage market risk?

- ✓ With CFD strike and volumes agreed ex-ante, frequency of settlement has no impact on the exposure
 - ✓ Security Fund has an **open exposure** to electricity price
 - ✓ Security Fund **cash flows can be budgeted** based on **expected price of electricity**
 - ✓ Security Fund **actual cash flows** can be significantly different from budgeted amounts
- Need for the security fund to either:
1. Have **access to liquidity and/or capital** to face required payments
 2. Have the capability to **transfer market risk** to a third party

CfD for Suppliers – Regulated Market and Free market

➤ CfD can be used as an effective hedging tool for suppliers

In a regulated market, suppliers sell electricity at regulated price, while the cost of electricity is subject to market fluctuations

- CfD Volume based on projected demand on regulated market
- CfD Strike based on Expected Regulated Price (TBD)

In free market, suppliers can utilize CfD to partially hedge electricity cost and provide fixed price contract to end users

- Volume based on free negotiation with suppliers, or imposed by regulators (vesting contract)
- Strike price is decided by Suppliers themselves (based on their expectation of future electricity price)