

Overview of System Sell and System Buy Prices

Introduction

This document provides a high level explanation of the calculation of imbalance settlement cash-out prices. Full information on this subject is contained in Section T – ‘Settlement and Trading Charges’ of the Balancing and Settlement Code (BSC), which can be downloaded from the ELEXON website – www.elexon.co.uk.

Imbalance Settlement

In practice, generators may generate more or less energy than they have sold; customers of suppliers may consume more or less energy than their supplier has purchased on their behalf and traders may buy more or less energy than they have sold. In such circumstances, these BSC Trading Parties are regarded as being ‘in imbalance’ and the ‘energy imbalances’ (i.e., the amounts of energy generated or consumed and not covered by contracts) have, in effect, been bought or sold from or to the system.

Two ‘cash-out prices’ or ‘Energy Imbalance Prices’ are calculated for each half hour of the day. One price, the System Sell Price (SSP), is paid to BSC Trading Parties who have a net surplus of imbalance energy, and the other, the System Buy Price (SBP), is paid by BSC Trading Parties who have a net deficit of imbalance energy. These prices are designed to reflect either the prices associated with the balancing mechanism Offers and Bids selected by the System Operator (National Grid) to balance the energy flows in the Transmission System, or to reflect the prices associated with the sale and purchase of (short-term) energy ahead of Gate Closure in the forwards and spot markets. The price associated with the balancing mechanism Offers and Bids² is called the main price. The price associated with short term energy trades is called the reverse price and is reflected as Market Index Data (MID).

Imbalances in the **same direction** as the Transmission System are cashed out at the Energy Imbalance Price calculated from National Grid’s balancing actions. So, as a general rule (i.e. no default situations):

- BSC Trading Parties that are long when the Transmission System is long (generation exceeds demand) get paid the SSP, which is applied to their energy imbalances, derived from National Grid’s balancing actions, e.g. Offers and Bids; and
- BSC Trading Parties that are short when the Transmission System is short (demand exceeds generation) pay the SBP, which is applied to their energy imbalances, derived from National Grid’s balancing actions.

Imbalances in the **opposite direction** to the Transmission System are cashed out at the Energy Imbalance Price calculated from the sale and purchase of (short-term) energy ahead of Gate Closure in the forwards and spot markets. So, as a general rule (i.e. no default situations):

- BSC Trading Parties that are long when the Transmission System is short get paid the SSP, which is applied to their energy imbalances derived from the MID; and
- BSC Trading Parties that are short when the Transmission System is long pay the SBP, which is applied to their energy imbalances, derived from the MID.

¹ Short term energy trading is when trades are carried out within three Business Days ahead of the half hour in which the energy is to be delivered.

² Offers and Bids can be submitted by all BSC Trading Parties up to Gate Closure. An Offer indicates a willingness to increase generation/decrease demand, a Bid indicates a willingness to decrease generation/increase demand.

Balancing Services Adjustment Data (BSAD)

As well as accepting balancing mechanism Offers and Bids, National Grid may contract with BSC Trading Parties in the bilateral markets for the provision of balancing energy. Where this contract replaces the need for National Grid to accept an Offer or Bid, these actions are taken into account in the calculation of the cash-out prices. Information on the costs of such contracts and the volumes of energy purchased, known as 'Balancing Services Adjustment Data' (BSAD), is factored into the calculation, as described below.

Cash-Out Price Calculation for Energy Imbalances in the Same Direction as the Transmission System

National Grid receives information from BSC Trading Parties enabling it to form a view on whether generation is likely to exceed demand, or vice versa, and determine if, overall, the Transmission System is likely to be 'long' or 'short' of energy. Depending on this view, National Grid may need BSC Trading Parties to vary their energy output or usage (through BSAD, Offers and Bids via the balancing mechanism). It may also be necessary for National Grid to take action to balance the system at short notice, for instance, if demand changes rapidly or if a generator suffers a fault.

The cash-out prices are derived from the prices of BSAD and accepted balancing mechanism Offers and Bids. For each half hour, the overall 'length' of the system is derived, by netting off all BSAD sales and accepted Bids, against all BSAD purchases and accepted Offers.

Where the Transmission System is overall short, i.e. the total volume of BSAD purchases and accepted Offers exceed the total volume of BSAD sales and Bids, then SBP is calculated as a volume weighted average of the net BSAD purchases and accepted Offers relating to the half hour.

Where the Transmission System is overall long, i.e. the total volume of BSAD purchases and accepted Offers is exceeded by the total volume of BSAD sales and Bids, then SSP is calculated as a volume weighted average of the net BSAD sales and accepted Bids relating to the half hour.

Not all accepted Offers and Bids are included in the respective weighted-average price calculations. The accepted Offers and Bids that are excluded are those selected for reasons other than for balancing total energy supply and demand. There are three categories:

- 1 'Arbitrage Accepted' Offers and Bids – National Grid may accept an Offer (e.g. to generate extra energy) at a given Offer Price and a corresponding Bid (e.g. to consume extra energy) at a Bid Price, which is higher than the Offer Price. The transaction has no effect on the energy balance of the system and the 'profit' merely defrays the total cost of balancing mechanism actions recovered via National Grid. In principle, the willingness of one BSC Trading Party to buy at a price higher than the price at which another BSC Trading Party is willing to sell, should have resulted in a bilateral contract. However, where this fails to happen such accepted Offers and Bids are 'arbitrage-tagged';
- 2 Short duration acceptances – specifically, any acceptance whose duration (or where two or more acceptances for any BM Unit are contiguous, the duration of the acceptances combined) is less than the Continuous Acceptance Duration Limit (or CADL) is excluded. CADL is a parameter set by the BSC Panel, and currently is set at fifteen minutes. The volume associated with these acceptances is included for the purposes of the netting;

3 Net Imbalance Volume (NIV) – Tagged Offers, Bids or BSAD – NIV Tagging is the processes of netting off the volumes of National Grid balancing actions. The most highly priced Bid and Offer acceptances and BSAD are netted off first and are referred to as NIV Tagged. The NIV Tagging will leave either a net volume of Offer acceptances (and BSAD purchases), or Bid acceptances (and BSAD sales), and these are referred to as NIV Untagged.

In addition, accepted Offers and Bids below a de minimis level (currently set to one MWh) are excluded. These very small acceptances can arise from rounding errors in Acceptance Data and generally do not represent actions for the purpose of balancing energy. Nevertheless, under some circumstances, these artificial volumes could, if not excluded, have an extreme effect on cash-out prices.

The main imbalance price is calculated based on the volume weighted average of a defined volume of the most expensive actions remaining. This defined volume is the Price Average Reference Volume (PAR) and is 500 MWh. PAR Tagging is applied such that;

- Where the Transmission System is overall short, SBP is calculated as a volume weighted average of not more than 500 MWh of the most expensive actions not previously excluded (i.e. up to 500 MWh of highest price Offers and BSAD purchases remaining following application of the arbitrage, CADL, NIV and de minimis processes); and
- Where the Transmission System is overall long, SSP is calculated as a volume weighted average of not more than 500 MWh of the most expensive actions not previously excluded (i.e. up to 500 MWh of lowest price Bids and BSAD sales remaining following application of the arbitrage, CADL, NIV and de minimis processes).

The purpose of the PAR mechanism is to align the imbalance price with the price of the marginal energy balancing action (i.e. the most expensive action taken by the System Operator to balance total energy supply and demand).

Imbalance Cash-out Diagram – generation

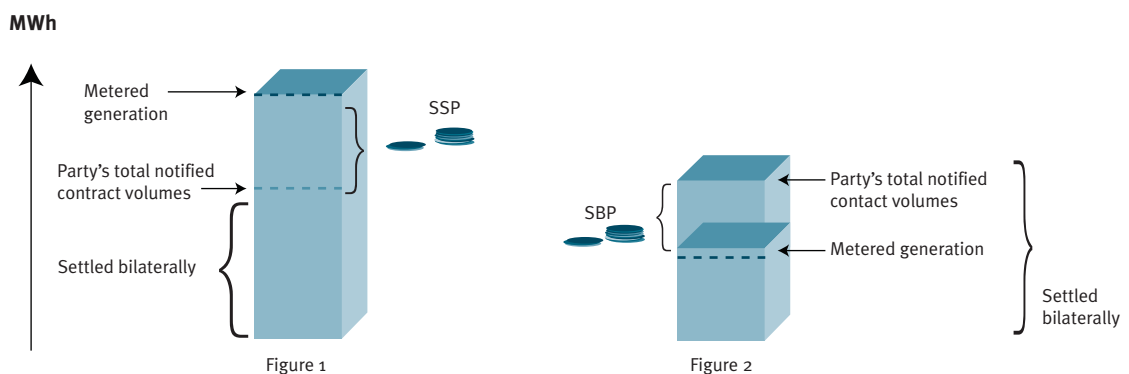


Figure 1. Displays a situation where a BSC Trading Party would be 'long'. In this case the BSC Trading Party has over-generated (compared to their contracts to sell energy). The BSC Trading Party will be paid SSP for the imbalance energy.

A BSC Trading Party would also be 'long' if they (or their customers) under-consumed (compared to their contracts to buy energy). In such case, the Party would again be paid the SSP for the volume of difference between the notified contract volumes and the actual metered consumption.

Figure 2. Displays a situation where a BSC Trading Party is 'short'. In this case the BSC Trading Party has under-generated (compared to their contracts to sell energy). The BSC Trading Party will pay SBP for the imbalance energy.

A BSC Trading Party would also be 'short' if they (or their customers) over-consumed (compared to their contracts to buy energy). In such case, the Party would again pay the SBP for the volume of difference between the notified contract volumes and the actual metered consumption.

Cash-Out Price Calculation for Energy Imbalances in the Opposite Direction to the Transmission System

Where the Transmission System is overall short, SSP is calculated as a volume weighted average of MID, i.e. short-term forward trades made the Market Index Data Provider (MIDP), relating to the half hour.

Where the Transmission System is overall long, SBP is calculated as a volume weighted average of MID relating to the half hour.

The process for calculating the Energy Imbalance Price from MID under these circumstances is the same.

The MIDP provides details of eligible trades which are used to derive a Market Index Volume (MWh) and associated Market Index Price (£/MWh) (as defined in the Market Index Definition Statement). Where the Market Index Volume is above a specified threshold (the Individual Liquidity Threshold, aimed at reducing the likelihood that the price will be set by a very small number of trades) for the MIDP, then the MID is used in the calculation of the Energy Imbalance Price, otherwise zero is used. The Energy Imbalance Price is calculated as a volume weighted average of all MID.

Default Prices

There may be occasions when there is no MID, and/or there are no relevant accepted Offers and/or Bids or relevant contracts (BSAD) from which to calculate the weighted average cash-out prices. In these circumstances default prices apply. There are a number of possible default circumstances for any half hour and these can be summarised as:

- where the Transmission System is long or short and there are no National Grid balancing actions to derive a price from, then both the SBP and SSP default to the price from the MID;
- where there is no MID, then the relevant price (SBP or SSP) defaults to the price derived from National Grid balancing actions;
- where the SSP is greater than the SBP (a negative spread), then both SBP and SSP are capped to the price derived from National Grid balancing actions;
- where the Transmission System is balanced (no National Grid balancing actions left after netting), then both the SBP and SSP will default to the MID; and
- in the extreme, where the Transmission System is balanced, and there are no National Grid balancing actions to derive a price from, and no MID, then both the SBP and SSP default to zero.

All of these circumstances are indicated by use of Price Derivation Codes which are published on the Balancing Mechanism Reporting Service (BMRS) – www.bmreports.com and in Settlement Reports which are received by BSC Trading Parties.

Negative Prices

The cash-out prices can be negative. If, at any given time, no BSC Trading Party is particularly inclined to reduce generation (or increase demand) then the prices of Bids to buy from the Transmission System will be low, and could even be less than zero. For example, it may be necessary to pay generators to produce less

energy. If the weighted average price of all accepted Bids is negative, then the SSP will be negative also, resulting in BSC Trading Parties being charged for producing more energy than anticipated or being long on the system.

In principle, the SBP could be negative too if BSC Trading Parties were, by way of their Offers, prepared to pay to generate additional output or to consume less. However, it would be likely that BSC Trading Parties would prefer to reflect such preferences by selling more or buying less in the bilateral contract market so this outcome is unlikely to occur.

Communication of the Cash-Out Prices

'Indicative' SBP, SSP and MID are reported on the BMRS in near real-time. BSC Trading Parties are sent Settlement Reports five working days after the energy has been produced and consumed, which contain a slightly refined view of the cash-out prices. A second Settlement report is sent to BSC Trading Parties sixteen working days after the energy has been produced and consumed, which contains the actual prices to which BSC Trading Parties who have imbalance energy are exposed. Subsequently, these prices and MID are also reported on the ELEXON website – www.elexon.co.uk.

ELEXON is the Balancing and Settlement Code Company (BSCCo) defined and created by the Balancing and Settlement Code (BSC). All licensed electricity companies are obliged to sign the BSC, other parties may choose to do so. The BSC places obligations on ELEXON.

The rules and governance for trading in the Balancing Mechanism and Imbalance Settlement process are contained within the BSC, and it's these two areas that ELEXON manages in conjunction with the BSC Panel.

ELEXON procures, manages and operates services and systems, which enable the balancing and Imbalance Settlement of the wholesale electricity market and retail competition in electricity supply.

Wholesale electricity trading arrangements, introduced in England and Wales in 2001 and in Scotland in 2005, are designed to promote greater competition, while maintaining a secure and reliable electricity system. The arrangements allow electricity to be traded freely, based on established commodity trading practices.

The role of ELEXON and the BSC arrangements are more fully described on www.elexon.co.uk.

If you have any feedback on this Information Sheet or any of ELEXON's publications, please email communications@elexon.co.uk, call on 020 7380 4119 or write to us at:

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