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**An Overview of the New  
Electricity Trading  
Arrangements**

**V1.0**

**A high-level explanation of the New  
Electricity Trading Arrangements  
(NETA)**

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## 1. INTRODUCTION

This document provides a relatively high-level explanation of the New Electricity Trading Arrangements (NETA). It should be read in conjunction with a number of other explanatory documents that have been or will be produced by the NETA Programme.

The audience for this document is expected to include those who are not familiar with the existing electricity trading arrangements in England and Wales. This document does not, therefore, explain how the New Electricity Trading Arrangements change from those currently in place. Furthermore this document is aimed at providing a factual description of how the New Electricity Trading Arrangements will operate, rather than attempting to explain why they will operate in a particular manner.

Given the intended audience, an attempt has been made to avoid using existing and new Industry jargon and acronyms, however some basic understanding of the major processes involved in the electricity supply chain (i.e. generation, transmission, distribution, and supply) and markets in general is assumed.

## 2. BASIC PRINCIPLES

One of the basic principles of the New Electricity Trading Arrangements is that those wishing to buy and sell electricity should be able to enter into any freely negotiated contracts to do so. It is expected that under the new trading arrangements, bulk electricity will be traded on one or more exchanges and through a variety of bilateral and multilateral contracts. Those buying and selling electricity on exchanges and through bilateral contracts are likely to include not only generators and suppliers (who produce or consume physical quantities of electrical energy), but non-physical traders as well.

The role of the NETA Programme is not to dictate how energy will be bought and sold on these exchanges or in bilateral contracts. Instead it is to provide mechanisms for near real-time clearing and settlement of the imbalances between contractual and physical positions of those buying, selling, producing and consuming electrical energy.

In practice, traders of electricity may buy more or less energy than they have sold; generators may physically generate more or less than they have sold; and the customers of suppliers may consume more or less energy than their supplier has purchased on their behalf. The central NETA systems are designed to measure these surpluses and deficits (or *imbalances*) and to determine the prices at which they are to be settled in order to send out invoices and payments for them. The processes involved in calculating and settling these imbalance volumes is referred to as 'Imbalance Settlement'. It should be reiterated that the purpose of Imbalance Settlement is not to price and settle bulk purchases and sales of electrical energy. Instead it is to price and settle the surpluses and deficits arising from the smaller differences between the contractual and physical positions of market participants.

The process of Imbalance Settlement requires a comparison of the quantities of electrical energy that parties have purchased and sold under contract with their metered quantities of physical generation and demand. This comparison is needed in order to determine an imbalance volume (i.e. a surplus or a deficit). It is also necessary to determine a set of prices for settling the surpluses and deficits. Because metered data for generation and wholesale demand is available on a half-hourly basis (i.e. electricity meters in England and Wales are set up so that the kWh of energy generated or consumed by generators or suppliers is measured on a half-hourly integrated basis), Imbalance Settlement will also operate half-hourly under

NETA. Thus imbalance volumes and imbalance prices will all be calculated on a half-hourly basis, and settled on a daily basis, approximately 28 days in arrears.

In addition to Imbalance Settlement, the central elements of the new trading arrangements are designed to fulfil a second related role. This second role is to provide a mechanism for adjusting the intended operating levels of generation and demand in real time.

The requirement to provide this mechanism is twofold. First, it is likely that the aggregate level of generation that generators intend to (and/or actually) produce will not match the aggregate level of demand that customers of suppliers intend to (and/or actually) take at any given time. Second, for a number of detailed technical reasons (including the fact that the transmission network in England and Wales has only a finite capacity), it is sometimes necessary to be able to adjust the level of production or consumption of individual generators or demands away from the level at which the generator or customer would otherwise wish to operate. By adjusting the output or inputs of generators and demands in this way, localised overloading of the transmission system can be prevented.

In addition to Imbalance Settlement, the NETA arrangements therefore provide for the creation of a 'Balancing Mechanism'. As discussed above, the Balancing Mechanism provides a means of adjusting the level of production or consumption of individual generators or demands. Under NETA, the 'System Operator' will determine what actions need to be taken in the Balancing Mechanism in order to maintain the required national and local balances of generation and consumption.

### **3. THE BALANCING AND SETTLEMENT CODE (BSC)**

The central elements of the new trading arrangements provide for two basic functions: the Balancing Mechanism and Imbalance Settlement. The rules that govern how these two functions are carried out are set down in the Balancing and Settlement Code.

Those persons that are bound by the terms of the Balancing and Settlement Code are collectively referred to as parties. It is anticipated that holders of generation, transmission, distribution/PES and supply licences will be required to be parties to the Balancing and Settlement Code whilst traders and others may choose to become parties to the Code.

### **4. GATE CLOSURE**

It is intended that bulk electricity will be traded by generators, suppliers and traders via a variety of means, including exchanges and bilateral contracts. The quantities of energy purchased and sold in these trades must be notified into the Imbalance Settlement mechanisms in order that they may be taken into account in determining the imbalance position of the parties. Furthermore, because Imbalance Settlement operates half-hourly, the traded quantities will be notified in respect of each half-hour.

It is expected that these trades may, in some cases, be made a year or more in advance of the half-hour to which they relate. Whilst trades may be notified some time in advance they cannot be notified after the event (i.e. after the half-hour to which they relate has passed). Instead, trades must be notified in advance of the half-hour to which they relate. The time limit by which information relating to trades needs to be notified into Imbalance Settlement is called 'Gate Closure' and is initially set at 3 ½ hours prior to the start of the half-hour to which it relates. Thus notifications of quantities of electricity purchase and sale for the settlement period 16:30 – 17:00 must be received before 13:00 on the same day. Every half-hour period has its own Gate Closure, set 3 ½ hours prior to the start of the half-hour.

Because quantities of purchases and sales for a particular settlement period must be notified prior to Gate Closure, physical trading of electricity on exchanges and under bilateral contracts is effectively prevented after this time. If, for example, at 14:00, a supplier purchased energy for the period 16:30 – 17:00, it would not be possible for that purchase to be taken into account when determining the imbalance position of that supplier in Imbalance Settlement. This is because the latest time for notification of contract volumes relating to 16:30 – 17:00 is 13:00. The supplier would therefore have to buy the energy to meet its physical demand from the Imbalance Settlement mechanism.

Gate Closure also has a significance that relates to the operation of the Balancing Mechanism. This is discussed further in section 6.

## **5. THE BALANCING MECHANISM**

### **5.1. Overview**

Generators and suppliers differ from pure traders of electricity in that not only do they buy and sell electrical energy under contract, they produce and have customers that consume physical quantities of energy as well. Under NETA, generators will, in general, be free to determine for themselves the level at which their individual generating units will operate. Similarly suppliers will, in consultation with their customers, generally be free to specify their intended levels of demand.

It is likely (although it is not a requirement) that the proposed level of physical operation of generation or demand will be related to the overall contractual position of the associated generator or supplier. Thus, it may be expected that a generator will wish to sell a net amount of energy that is related to its intended level of physical generation. Similarly a supplier may wish to buy an amount of energy that is related to the expected level of physical demand taken by its customers. Again, whilst this may be likely, it is not a requirement, and parties can elect deliberately to be in imbalance should they wish to do so.

Once generators and suppliers have decided on the levels at which they wish to operate, they are required to notify these levels to the System Operator. In practice not all generation and demand will be required to notify these operating levels. This is discussed further in section 6.3.

When notifying their proposed operating level to the System Operator, generators and suppliers may, if they wish, also indicate a willingness to deviate from these operating levels. In exchange for payment, generators may be willing to increase or decrease the output of their generating units, and suppliers may have in place arrangements for their customers to be able to increase or decrease their demand.

To this end, generators and suppliers may submit Offers and Bids into the Balancing Mechanism. Generators and suppliers may both submit Offers and Bids. Offers indicate a willingness to increase the level of generation or reduce the level of demand. Conversely, Bids indicate a willingness to reduce the level of generation or increase the level of demand.

The System Operator may 'accept' particular Offers and Bids placed by generators and suppliers in order to control the national and local balance of generation and demand.

This process is described in more detail in the next section.

### **5.2. Physical Notifications**

Generators and suppliers that are required to notify the System Operator of their intended operating level do so by submitting 'Initial Physical Notifications' (IPNs) and

'Final Physical Notifications' (FPNs), in accordance with the requirements of the Grid Code.

An Initial Physical Notification relating to expected operating levels throughout the whole day must be submitted to the System Operator by 11.00am on the day before trading.

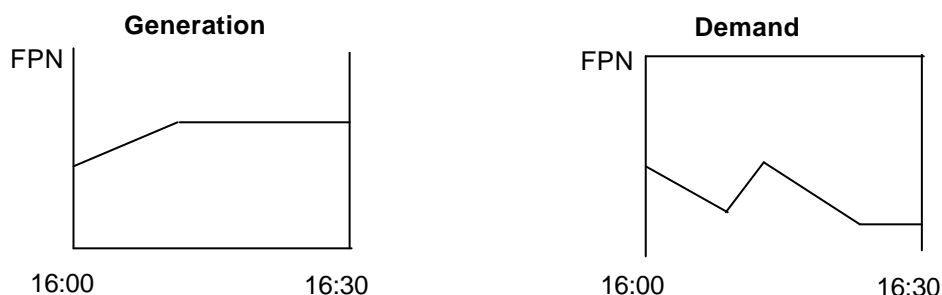
A Final Physical Notification relating to proposed operating levels in a particular half-hour must be submitted to the System Operator by Gate Closure.

This information is in addition to the contract information relating to purchases and sales of electricity to Imbalance Settlement (as described above) which must also be submitted by this time (although in the case of contracts, the information is submitted to central settlement and not to the System Operator).

Where submitted, Final Physical Notifications must normally be submitted for individual generating units and for individual demands. This is because the System Operator needs locationally specific information in order to ensure that generation and demand is safely matched locally as well as nationally.

Final Physical Notifications take the form of a minute-by-minute profile of the expected power output or consumption of the relevant generation or demand across each settlement period. The information is specified to the nearest MW. A graphical example of the Final Physical Notification data for a generator and a demand is given below.

Figure 1 – An example of Final Physical Notifications for Generation and Demand



The convention used is that power exports are expressed as positive values, whereas imports are expressed as negative values. Thus it is likely that generators will have positive FPNs, and demand will have negative FPNs.

### 5.3. Requirement to Submit Physical Notifications

Parties responsible for wholesale electricity production and consumption will not necessarily be required to submit Physical Notifications to the System Operator for all generation and demand. In practice, the System Operator does not need information relating to smaller plant (generation and demand) in order to ensure safe operation. For this reason Physical Notifications are only needed when the 'relevant plant' is above a de minimis limit of 50MW.

In this context, 'relevant plant' means a 'BM Unit'. The definition of a BM Unit is discussed in more detail in section 6.4.

### 5.4. BM Units

The term 'BM Unit' is used to describe collections of generation plant and 'demand plant' that import and/or export electricity, so that physical imports and exports can be treated appropriately under the Balancing and Settlement Code.

Because of the number of different types of generation and demand that it must cover the exact definition of a BM Unit is somewhat involved. However, for generating plant, a BM Unit is typically a single generating unit. For demand the

definition of a BM Unit is largely dictated by the metering information available to Imbalance Settlement. For large demands, separate metering information is available on a half-hourly basis. In this case, the associated BM Unit is essentially defined as the aggregate of a party's demand behind a single point of connection to the transmission or distribution system. For smaller demand, half-hourly metering information is not available on a site-by-site basis for Imbalance Settlement. Instead, the metering information that is available is the aggregate of small demands supplied by a demand on individual suppliers over 12 different 'GSP Groups'. In this case, the relevant BM Unit is the aggregate of a particular supplier's demand in each of the GSP Groups.

Parties to the Balancing and Settlement Code are required to submit Initial Physical Notifications and Final Physical Notifications to the System Operator by Gate Closure if the associated BM Unit is larger than 50MW (i.e. the BM Unit has a maximum associated import or export in excess of 50MW).

### 5.5. Participation in the Balancing Mechanism

The BM Unit is the basic unit of participation in the Balancing Mechanism. In order for a BM Unit to be used to provide services to the System Operator in the Balancing Mechanism a Final Physical Notification must be submitted for that BM Unit. Consequently, some parties may also choose to submit Final Physical Notifications for BM Units that are smaller than 50MW if they wish to use these BM Units to offer services in the Balancing Mechanism.

Another pre-requisite for BM Unit participation in the Balancing Mechanism is the requirement to establish appropriate electronic communication links with the System Operator. Under NETA, these links must be electronic in order to handle the large amounts of data transfer. The links are needed for two reasons: first for a party to submit Final Physical Notifications and Bids and Offers for individual BM Units to the System Operator; and second for the System Operator to inform the party when it wishes to call off (or 'accept') Offers and Bids. These issues are discussed in more detail in the next section.

### 5.6. Offers and Bids

If a BM Unit is to be used to offer services in the Balancing Mechanism, in addition to the Final Physical Notifications, the party also submits Offers and Bids for that BM Unit.

Offers and Bids indicate a party's willingness to operate the BM Unit at a level other than the Final Physical Notification in exchange for payment. They take the form of a set of prices and volumes. An example is given in Figure 2 below.

Figure 2 – An example of Offers and Bids

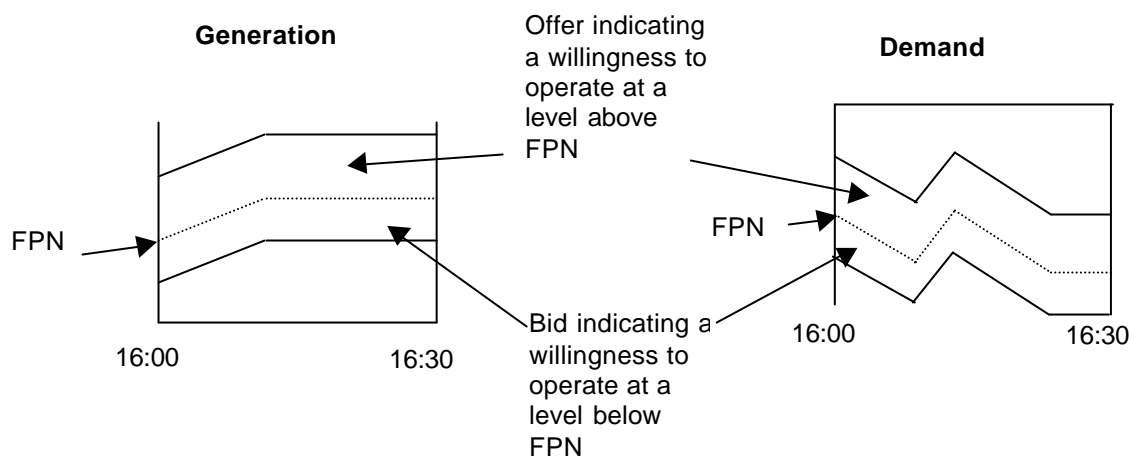




Figure 2 shows a simplified set of Offers and Bids for a generation BM Unit and a demand BM Unit. Offers indicate a willingness to operate above the level of Final Physical Notification, and Bids to operate at a level below Final Physical Notification. (Note that the consumption FPN is a negative value, so 'operating above the FPN' actually means consuming less). If the System Operator wishes to increase the net amount of energy being delivered to the system it may accept an Offer from a BM Unit. If this is a generating BM Unit, then the BM Unit should increase its level of export. If it is a demand BM Unit, then the demand should reduce its level of import.

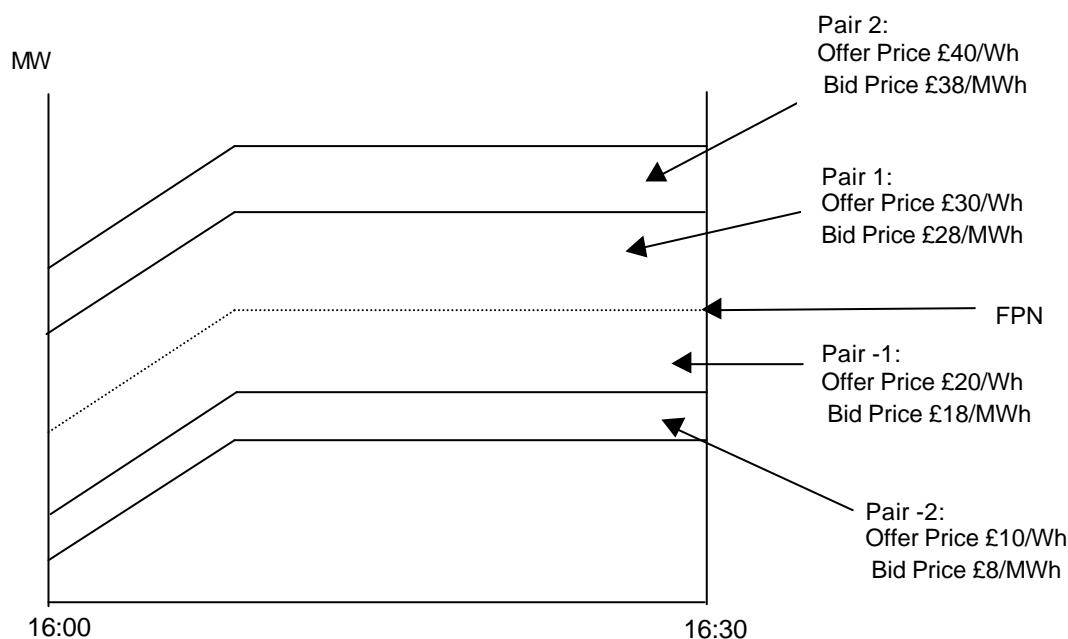
If the System Operator wishes to decrease the net amount of energy being delivered to the system, then it may accept a Bid from a BM Unit. If this is a generating BM Unit, then the BM Unit should decrease its level of export. If it is a demand BM Unit, then the demand should increase its level of import.

The diagrams in Figure 2 above are simplified because in practice, a party may submit several Offers and Bids for a single BM Unit for a particular settlement period. This means, for example, that the price for operating a generating BM Unit at a level up to 100MW above Final Physical Notification may be £30/MWh, whereas for operating between 100MW and 200MW above Final Physical Notification, the price may be £40/MWh.

A further feature of the Balancing Mechanism is the fact that it is 'firm' on the System Operator. This means, for example, that once the System Operator has informed the relevant party that it wishes to accept an Offer from a BM Unit it is committed to purchasing that Offer. If the System Operator subsequently decides that the initial decision to purchase an Offer was incorrect, then, instead of simply cancelling the original purchase, it must accept a Bid (either from the same BM Unit, or from a different BM Unit if it is economically more efficient as well as physically suitable). This means that for every Offer, there is a complementary 'undo' Bid. Furthermore for every Bid there is an associated 'undo' Offer. For this reason, Offers and Bids are submitted in pairs. These pairs are given numbers to identify them. The numbering convention is such that where the Offers and Bids are for operation above Final Physical Notification, the pair numbers are positive. If they are for operation below Final Physical Notification, the pair numbers are negative.

A more detailed example of the Offers and Bids submitted for a generating BM Unit is shown in figure 3. This highlights the pairing of Offers and Bids.

Figure 3 – More detailed example of pairs of Offers and Bids for a generating BM Unit



Offers and Bids therefore indicate the price for different levels of operation relative to the Final Physical Notification. As may be seen from figure 3, an initial restriction under the new electricity trading arrangements is that the level of any pair of Bids and Offers is fixed (relative to FPN) for the duration of the settlement period. In common with Final Physical Notifications, Offers and Bids for a BM Unit applying to a particular half-hour must be submitted by Gate Closure for that half-hour.

## 5.7. Operation of the Balancing Mechanism

The purpose of the Balancing Mechanism is to provide the System Operator with a means of undertaking several functions as follows: matching system-wide imbalances between electricity production and consumption; adjusting local and bulk power flows to ensure the security of the transmission network; placing BM Units in a position to deliver other Balancing Services. Balancing Services are technical services, purchased by the System Operator. They are required in order to maintain the reliability and security of the transmission and distribution networks. They include services to operate generation and demand plant in a manner that will support system voltage and system frequency.

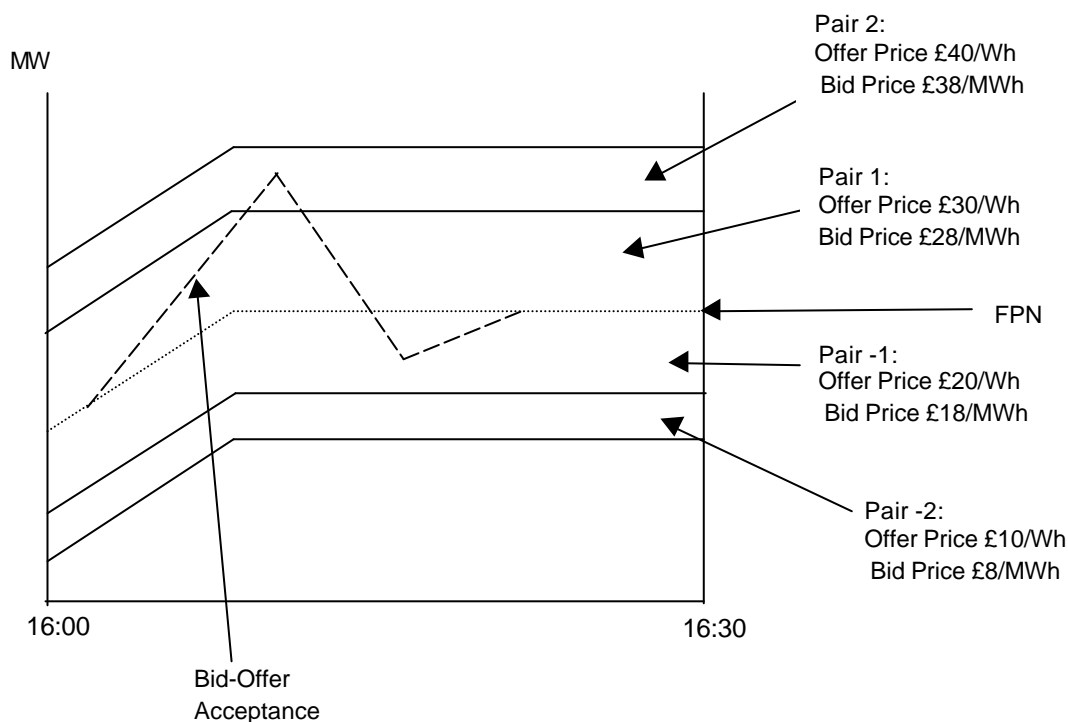
The operation of the Balancing Mechanism for a particular half-hour starts after Final Physical Notifications and Offers and Bids have been submitted to the System Operator for that half-hour – i.e. after Gate Closure. The System Operator is solely responsible for determining which Offers and Bids are accepted in the Balancing Mechanism. The System Operator may accept all or part of any Offer or Bid at any time after Gate Closure up until real time.

Whilst the System Operator is generally free to accept any Offer or Bid at any time between Gate Closure and real time, the System Operator is required to ensure that any acceptance it makes is consistent with the dynamic parameters of the associated BM Unit. The dynamic parameters of a BM Unit give information relating to the limitations on physical operation of the BM Unit. This include the rates for increasing and decreasing output and input levels, information relating to stable levels of

operation, and the maximum levels of import and export that each BM Unit is capable of.

In accepting Offers and Bids, the System Operator will inform the relevant party of the absolute level at which it wishes the BM Unit to operate. In doing so, the System Operator may accept several Offers and/or Bids at once. The set of data issued by the System Operator to the party is called a Bid-Offer Acceptance. A Bid-Offer acceptance is illustrated in Figure 4.

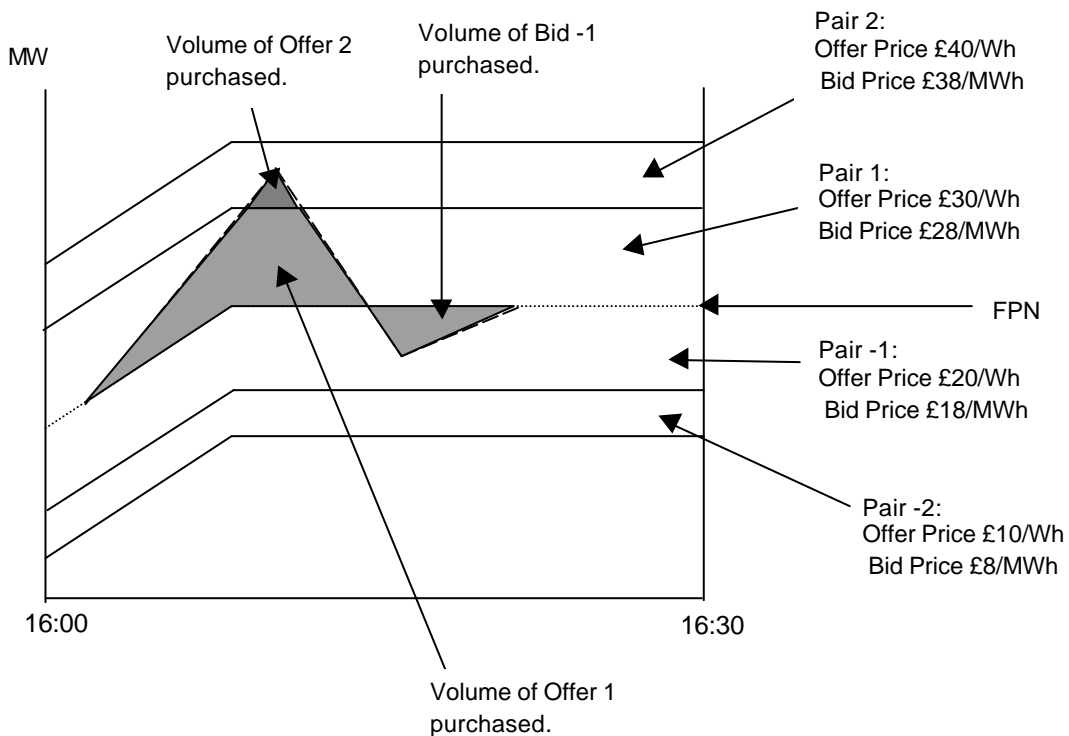
Figure 4 – Accepting Offers and Bids



In figure 4, a single Bid-Offer Acceptance has been issued by the System Operator that affects three of the Offers and Bids submitted for the settlement period. From this, the shaded areas in figure 5 show the quantities of Offers 1 and 2, and Bid -1 that are all accepted by the single Bid-Offer Acceptance.

Note the numbering convention for Bid-Offer Pairs is that those above FPN are given positive numbers and those below FPN are given negative numbers.

Figure 5 – Volumes of Offers and Bids Accepted



Offers are purchased where the System Operator has requested operation above the level of FPN. Bids are purchased where the requested level is below FPN. Thus in the above diagram, parts of Offers 1 and 2 are initially purchased. Later, half-way through the settlement period, when the requested operating level falls below FPN Bid number –1 is purchased.

As shown in Figure 5 above, the volume of accepted Offers or Bids determined from a single Bid-Offer Acceptance is calculated on a minute by minute basis across the half-hour.

In some extreme circumstances, (e.g. if there are insufficient Offers and/or Bids available for the System Operator to balance the system) it may be necessary for the System Operator to require certain BM Units to operate at a level other than FPN, even if no Offers or Bids have been submitted for those BM Units. In this case, the System Operator will not log an acceptance for the BM Unit in question (because there are no Offers or Bids against which the acceptance may be settled). In most situations there will be an impact on the imbalance position of a party instructed by the System Operator in this way.

The detailed operation of the Balancing Mechanism and the interface between parties and the System Operator will be set down in the Grid Code, and in the Balancing Principles. The Grid Code is a technical document describing the interfaces between those parties that connect to and use the electricity transmission network. It is anticipated that the Balancing Principles will be produced by the System Operator (as a requirement of the Transmission Licence).

## 5.8. Payment for Offers and Bids

The volume of an accepted Offer or Bid is determined as the volume of the shaded areas in Figure 5. Thus in the example in Figure 5, three MWh values would be determined as a result of the single Bid-Offer Acceptance. These are the MWh of purchase of Offers 1 and 2 and the MWh of purchase of Bid –1.

Accepted Offers and Bids (adjusted to reflect transmission losses) will be settled at the relevant Offer or Bid Price. In the case of Offers, the party responsible for the BM Unit will be paid at the relevant Offer price multiplied by the losses adjusted volume of the accepted Offer.

In the case of Bids, the party responsible for the BM Unit will pay (rather than be paid) at the prevailing Bid price multiplied by the losses adjusted volume of the accepted Bid. The reason why parties are paid for Offers, but are charged for Bids is explained as follows:

A demand BM Unit from which a Bid is accepted is expected to increase its demand. The Bid price therefore simply represents the price that the party is willing to pay for an additional MWh of demand that it had not already purchased under a bilateral contract.

If a Bid is accepted from a generation BM Unit, a reduction in the generation from that unit is expected. The Bid price in this case, simply represents the price that the party is willing to pay to avoid having to actually generate a MWh of energy.

Note that it is possible for both Offer and Bid prices to be negative. If a negatively priced Offer was accepted, the party would be charged for increasing its generating output, or for reducing its demand. If a negatively priced Bid was accepted, the party would be paid for increasing its demand, or for reducing its generation.

### **5.9. Arbitrage Offers and Bids**

Because parties are paid for accepted Offers at Offer Price and are charged for accepted Bids at Bid price, if one BM Unit has an Offer Price that is less than the Bid Price of another, the System Operator can in fact save money by making an 'arbitrage' trade. This involves simply accepting both the Offer and the Bid.

Note that both parties (i.e. from whom the Offer and the Bid were accepted) should be satisfied with the arbitrage, because they have freely submitted Offers and Bids into the Balancing Mechanism indicating the price at which they are prepared to take the balancing action.

Arbitrage Offers and Bids are treated slightly differently from other Offers and Bids when calculating energy imbalance prices (see below).

### **5.10. Non-Delivery Charges**

A number of Offers and Bids may be accepted from a particular BM Unit in any particular settlement period. Furthermore, as discussed above, accepted Offers and Bids may be 'undone' by accepting an Offer or Bid in the opposite direction. The net amount of Offers and/or Bids accepted in a particular half-hour from a BM Unit will result in a net expected profile for the operation of the BM Unit in that half-hour.

If a BM Unit has a net volume of accepted Offers (i.e. more accepted Offers than Bids), then if the BM Unit shortfalls (i.e. generates less than expected, or imports more than expected) it will be subject to non-delivered Offer charges. If a BM Unit has a net volume of accepted Bids, then it may be subject to non-delivered Bid charges.

Thus non-delivery charges are made if the meter reading for a BM Unit reveals that the BM Unit has failed to deliver its Offers or Bids on an aggregate basis across the half-hour. In the event of non-delivery, the part of any Offer or Bid that is not delivered is charged a non-delivery charge.

## **6. INFORMATION IMBALANCE CHARGES**

Information Imbalance Charges are intended to provide an incentive for parties to operate their BM Units in accordance with their Final Physical Notification modified by any accepted Offers or Bids.

The Information Imbalance Volume for a BM Unit is simply the difference between the metered output recorded over the settlement period, and the level at which the BM Unit should have been operating in aggregate over the half-hour period, given its Final Physical Notification and any accepted Offers and Bids.

The Information Imbalance Charge is the same irrespective of whether a party generated or consumed above or below its expected level. Thus a BM Unit that 'spills'<sup>1</sup> by 1MWh is charged the same Information Imbalance Charge as a BM Unit that is in deficit for 1MWh.

Information Imbalance Charges are levied on the party that registers the BM Unit in the settlement system, irrespective of whether the metered output of the BM Unit has been assigned to another party (see section 7).

Initially, the Information Imbalance Price will be set at zero, and consequently no charges will actually apply.

## **7. ENERGY IMBALANCE**

### **7.1. Overview**

In addition to the provision of a Balancing Mechanism, the Balancing and Settlement Code provides for the settlement of imbalances between the actual and contractual positions of parties in each settlement period.

As explained in section 3 above, under the new electricity trading arrangements it is expected that bulk purchases and sales of electricity will be made under the terms of bilateral contracts and via electricity trading exchanges. Generators, suppliers and electricity traders are expected to be active in this trading activity. In addition to striking contracts for purchase and sale of electricity, generators and suppliers will also be responsible for physical quantities of electricity production and consumption. Energy Imbalances settlement is needed in order to settle the differences between the net contractual and net physical position of all parties.

Thus, in order to settle Energy Imbalances, it is necessary to determine the metered production or consumption of each party and the net contractual position for each party in each settlement period. It is also necessary to determine the prices at which Energy Imbalances will be settled.

Under the new trading arrangements a two-part cashout of imbalances will be undertaken. The price paid to parties that have a net surplus of imbalance energy will be different from the price that is paid by parties that have a net deficit of imbalance energy.

A further feature of Imbalance Settlement under NETA is that for a single party, two Energy Imbalances will be calculated. Energy Imbalances for 'Production' related activities and 'Consumption' related activities are treated separately. Broadly speaking, 'Production' relates to generation and 'Consumption' relates to demand. The calculation of Energy Imbalance Prices is described in section 8.7 below.

This two-part imbalance arrangement is effected by the calculation of a 'Production Energy Imbalance' and a 'Consumption Energy Imbalance' for each party. Parties are

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<sup>1</sup> 'spill' is basically extra electricity on the system, which is either electricity generated without an associated contract or accepted balancing mechanism offer, or where a demand-taker has contracted for a greater amount of electricity than in the event they actually consume.

said to hold two Energy Imbalance Accounts, a Production account and a Consumption account.

The level of the Energy Imbalance for each of a party's accounts is calculated as the difference between the metered quantities of generation and demand allocated to each of the accounts and the contract quantities allocated to each of the accounts.

The Production Energy Imbalance will be the difference between the aggregate metered Production allocated to the party, and the net of contract volumes notified to the Production Energy Account. Similarly the Consumption Energy Imbalance will be the difference between the aggregate metered Consumption allocated to the party and the net contract volume notified to the Consumption Energy Account.

## **7.2. Energy Contract Volume Notification**

In order to take account of the quantities of purchase and sale of electrical energy in a particular settlement period in Energy Imbalance, it is necessary for such contract quantities to be notified into central settlement.

If two parties trade electricity (either via a bilateral contract or through an exchange), it is necessary for the parties to notify central settlement of the volume of the contract (in kWh), and to identify which party has purchased the energy and which party has sold it. Note that it is not necessary for central settlement to have any information relating to the price at which energy was bought and sold under the contract in order to determine Energy Imbalance volumes.

Under the new trading arrangements, both parties to a contract must notify the relevant volumes into central settlement through a single agent. The Energy Contract Volume Notification Agent (ECVNA) acts on behalf of the trading parties, and notifies information relating to the electricity trade into central settlement. This information includes details of the trading parties and the kWh quantities of trade (in addition to passwords etc.). Contract volumes for a particular settlement period must be notified into central settlement (specifically to the Energy Contract Volume Aggregation Agent, ECVA) by the notification agent prior to Gate Closure for that settlement period.

A single pair of trading parties may nominate any number of Energy Contract Volume Notification Agents to act on their behalf. (One of the parties themselves could be an Energy Contract Volume Notification Agent).

In practice, the information contained in contract volume notifications needs to be slightly more specific about the parties involved in the contract trade. It is necessary to not only identify the parties involved, but the specific Energy Accounts of the parties to which the trade relates. Thus the Energy Contract Volume Notification Agent must identify both the parties and either their Production Energy Account or the Consumption Energy Account. Note that it is possible not only for the Production Energy Account of one party to sell to the Consumption Energy Account of another and vice versa, but also for a single party to notify energy 'purchases' and 'sales' between its own two Energy Accounts.

Subject to some credit monitoring, there are no restrictions on the energy contract volumes that may be notified to and from each account.

## **7.3. Energy Contract Volume Aggregation**

Once received by central settlement, the notified contract volumes are aggregated for each of the Production and Consumption Energy Accounts of each party to determine a net contractual position for each of the accounts. These net contractual positions will be compared to the net metered quantities allocated to each of the

Energy Accounts in order to determine the Energy Imbalance for each Production and Consumption Account.

#### **7.4. Production and Consumption and Imports and Exports**

In order to determine the metered quantities that need to be taken into account when calculating Energy Imbalances, it is necessary to collect metering data for each BM Unit in each settlement period. This metered data is collected in a number of different ways, but is ultimately used to establish a metered volume for each BM Unit in each settlement period.

Whether the metered volume of a BM Unit will be treated as Production or Consumption (and consequently whether it will be aggregated to the Production or Consumption energy account for imbalance purposes) depends upon the 'Type' of the BM Unit - i.e. whether the BM Unit itself is either a Production or Consumption BM Unit.

The Type of a BM Unit is based upon whether, over the year, the maximum level at which it is expected to be exporting over any settlement period is more or less than the maximum level at which it is expected to be importing over any settlement period. It is generally intended that BM Units that comprise generating plant will be Production BM Units and BM Units that comprise supplies will be Consumption BM Units. In practice some BM Units will also be permitted to choose their Type freely.

A further factor to be taken into account in determining the Type of a BM Unit is whether the BM Unit is to be aggregated with a number of other BM Units within a single Trading Unit. In this case, the type of all the BM Units in the Trading Unit is determined on a collective basis.

The metered quantities from the BM Unit will be allocated to the Energy Account type that matches the type of the BM Unit (i.e. Production or Consumption). Thus metered quantities for Production BM Units will be allocated to Production Energy Accounts, and metered quantities for Consumption BM Units will be allocated to Consumption Energy Accounts.

It should be recognised that Production BM Units may, in some settlement periods, import electricity and Consumption BM Units may export electricity. The difference between import and export and Production and Consumption for a BM Unit is an important feature of the trading rules.

Whether the metered volume associated with a particular BM Unit is treated as an import or an export for settlement purposes depends upon whether its associated Trading Unit has, in aggregate, imported or exported in that particular settlement period. The classification as an import or export affects the treatment of the BM Unit Metered Volume for purposes of transmission loss factor application, and revenue surplus reallocation (see section 10 below).

#### **7.5. Metered Volume Reallocation Notification**

So as not to restrict parties' commercial freedom, it will be possible for the energy flowing to or from an individual BM Unit to be allocated between two or more different parties for the purpose of calculating energy imbalances. (This would allow, as an example, a supplier to notify volumes relating to a share of a customer's meter, in order to meet that customer's requirements for partial supply).

By default, the party registering the BM Unit is responsible for the metered quantities arising from the BM Unit. Thus by default, the metered quantities from Production BM Units will be allocated to the party's Production Energy Account, whereas the metered quantity from Consumption BM Units will be allocated to a party's Consumption Energy Account.



It is also possible for the party responsible for a BM Unit to reallocate some or all of the metered volume for the BM Unit to another party for any given settlement period(s). As with contract volume notifications, metered volume reallocations must be notified into central settlement by Gate Closure. The information contained within a metered volume reallocation includes identification of the relevant BM Unit and the name of the party and associated Energy Account to which the metered volume is to be reallocated. The information may also contain either a fixed number of kWh to be reallocated from the BM Unit, or a percentage of the metered volume to be reallocated.

The party responsible for a BM Unit is termed the Lead Party, whereas the party receiving the metered volume reallocation is termed the Subsidiary Party.

If a metered volume fixed reallocation is made, the fixed amount is reallocated to the relevant Energy Account of the Subsidiary Party. If a percentage reallocation is made the appropriate percentage of the actual meter reading for the BM Unit is reallocated to the relevant Energy Account of the Subsidiary Party. In each case, the relevant Energy Account of the Lead party is credited with the actual metered output less the reallocated amount.

Any number of percentage reallocation notifications may be made for a particular settlement period for a given BM Unit, however the aggregate of all the percentages must not exceed 100%, nor may negative percentages be reallocated. There are no restrictions on the number or sign of fixed reallocations that may be made in relation to a single BM Unit.

## **7.6. Energy Imbalance Volumes**

The Energy Imbalance Volume for a particular energy account is the net of all metered quantities and contract volumes allocated to that account. The Energy Imbalance Volume for an account may be positive (showing that a net surplus of energy accrued to the account), or negative (showing that a net deficit of energy accrued to the account). For the purposes of aggregation, metered exports are treated as positive values and metered imports as negative.

It is possible for a single party to have a net surplus of energy in one Energy Account and a net deficit in the other in the same settlement period. Two separate charges would be applied in this situation, as discussed further in section 8.7.

## **7.7. Energy Imbalance Price Calculation**

Energy Imbalance Prices are the prices used to settle the Energy Imbalance surpluses or deficits. There are two Energy Imbalance Prices – the System Buy Price and the System Sell Price.

The System Buy Price is the price at which deficits are charged. It is intended to reflect the average price at which the system had to buy in order to make good the deficit on behalf of the party. Thus if an Energy Account has a negative Energy Imbalance, this is charged for at System Buy Price.

The System Sell Price is the price at which surpluses are charged. It is intended to reflect the average price at which the system had to sell in order to dispense with the surplus spill energy. If an Energy Account has a positive Energy Imbalance, this is paid for at System Sell Price.

Energy Imbalance prices are derived from the prices of Offers and Bids accepted by the System Operator in the Balancing Mechanism. System Buy Price for a particular settlement period is calculated as the volume weighted average of accepted Offers relating to that settlement period. System Sell Price for a particular settlement period is the volume weighted average of accepted Bids relating to that settlement period.

In fact, not all accepted Offers and Bids are necessarily used in the calculation of Energy Imbalance Prices. Some accepted Offers and Bids may be excluded from the weighted average calculation because they are flagged as being either 'arbitrage' trades or as 'System Balancing' trades, (as opposed to 'Energy Balancing' trades).

Arbitrage trades are those trades described in section 6.9. Arbitrage trades are easily identified as those accepted Bids and Offers for which the Offer Price is less than (or equal to) the Bid Price.

'System Balancing' trades are more complicated to identify. They exist because the Balancing Mechanism is used not just to deal with system-wide energy imbalances. It is also needed in order to provide the System Operator with a means of meeting a variety of more complex system requirements (for example to change a generator's output so as to change power flows on the transmission system, so that voltages remain within reasonable limits).

System Balancing trades are excluded from accepted Bids and Offers prior to calculating the Energy Imbalance Prices. They are excluded by simply disregarding some of the extremely priced accepted Offers and Bids (i.e. some of the highest priced accepted Offers and some of the lowest priced accepted Bids).

There are a number of other detailed adjustments in the calculation of the prices, for example transmission losses are taken into account in the weighted averaging calculation of Energy Imbalance Prices, and adjustments may be made if the System Operator has entered into certain contracts before Gate Closure.

Under normal circumstances, System Buy Price is expected to exceed System Sell Price.

## **7.8. Energy Imbalance Cashflows**

The term 'Energy Imbalance Cashflow' is used to describe the charges or payments that arise as a result of settling Energy Imbalances. Where an Energy Account has a positive Energy Imbalance, it is paid at System Sell Price, and where it has a negative Energy Imbalance, it is charged at System Buy Price.

## **8. SYSTEM OPERATOR CHARGES**

Whilst accepted Offers and Bids are used to determine Energy Imbalance Prices, the costs of operating the Balancing Mechanism are in fact met by the System Operator. The System Operator is required to pay for the net cost of all accepted Offers and Bids (less any charges arising from non-delivery).

## **9. REVENUE SURPLUS REALLOCATION**

A variety of payments and charges arise relating to various aspects of the Balancing Mechanism and Energy Imbalance settlement for every settlement period. These include payments and charges for accepted Offers and Bids and for positive and negative Energy Imbalances. Furthermore, there are charges for non-delivery of Offers and Bids and for Information Imbalance. Finally the System Operator is charged for the total cost of Balancing Mechanism action.

The net of all these charges and payments in any settlement period is not zero. In general, the net of all the charges and payments will result in an overall surplus of funds in each settlement period. This surplus is reallocated to parties, pro-rated across all metered imports and exports for which each party is responsible in each settlement period.

Note that in the case where a party reallocates metered quantities to a second party via a metered volume reallocation, then it is the second party that receives the pro-rated revenue surplus reallocation. It is anticipated that this may be taken into

account when the parties agree the price for the metered volume reallocation in the first instance.

## **10. SUMMARY**

One of the basic principles of the New Electricity Trading Arrangements is that those wishing to buy and sell electricity should be able to enter into any freely negotiated contracts to do so. It is expected that under the new trading arrangements, bulk electricity will be traded on one or more exchanges and through a variety of bilateral and multilateral contracts. Those buying and selling electricity on exchanges and through bilateral contracts are likely to include not only generators and suppliers (who produce or consume physical quantities of electrical energy), but non-physical traders as well.

The objective of the new arrangements is not to dictate how energy will be bought and sold on these exchanges or in bilateral contracts. It is to provide mechanisms for near real-time clearing and settlement of differences between contractual and physical positions of those buying, selling, producing and consuming energy.

The following two mechanisms are therefore required: a mechanism by which the System Operator can change proposed operating levels of generation and demand near to real time – the Balancing Mechanism - and a mechanism for settling the differences between net physical and net contractual positions of parties – Imbalance Settlement. The detailed rules associated with these mechanisms will be contained in the Balancing and Settlement Code (BSC).

## **11. DISCLAIMER**

Any information in this document is offered in good faith to assist interested parties in their preparation for the introduction of the New Electricity Trading Arrangements. However, readers should be aware that some details of the Trading Arrangements may be subject to modification. Readers should also be aware that implementation of the New Arrangements is dependent on the timetable of the Utilities Bill; and that the new Balancing and Settlement Code (BSC), as well as the Implementation Scheme which will govern aspects of the transition from the current Arrangements to the BSC, will only be designated by the Secretary of State after consultation, review (and consequent amendment) of drafts of these documents. Accordingly, the information contained herein should be viewed as provisional. No warranty nor representation is given as to the accuracy or completeness of any of the information provided in this document, and none of the DGES, DTI, NGC, participants in the NETA Programme nor advisors to any of them shall be liable for error, mis-statement or omission.

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