



Commission for Electricity Regulation

An Coimisiún um Rialáil Leictreachais

DISCUSSION PAPER ON MARKET PRICING

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Discussion Paper on Market Pricing

The following modifications could be put in place in the Trading and Settlement Code (“the Code”) with effect from the earliest possible date (the “Implementation Date”). The current calculations for top up, spill and secondary top up would remain in place up to the Implementation Date and after the Implementation Date in the case of top up and spill for Green/CHP generators and suppliers.

1. Access to top up priced supplies

- 1.1 Green and/or CHP generators and suppliers shall continue to be able to buy all their top up requirements at the top up price, as is currently the case, until such time as the Commission decides otherwise.
- 1.2 Non Green and Non CHP generators and suppliers shall not have access to top up priced supplies after the Implementation Date.

2. Calculation of spill prices for Green and CHP generators and suppliers

- 2.1 Green and/or CHP generators and suppliers shall continue to be able to sell spill at the spill price, as is currently the case, until such time as the Commission decides otherwise.
- 2.2 The spill price referred to in point 2.1 above shall be calculated as set out in the current version of the Code, except that the 25% rule referred to in the Minister’s Policy Direction shall cease to apply from the Implementation Date.

3. Calculation of top up and spill prices for non green/non-CHP generators and suppliers

- 3.1 From the Implementation Date, for Non Green and Non CHP generators and suppliers, the calculation of the top up and spill prices in any trading period shall be identical. For ease of reference in this paper, this single, uniform price will be referred to as the market price.

Market Price to apply from the Implementation Date

- 3.2 The market price shall comprise a capacity component and a marginal energy component.
- 3.3 The market price, in any Trading Period, shall be calculated as:

$$MEP_h * (1 - LOLE) + LOLE * VOLL$$

Where:

$LOLE_h$ is the Loss of Load Expectation for Trading Period h, $VOLL$ is the Value of Lost Load and MEP_h is the Marginal Energy Price for Trading Period h.

- 3.4 The Marginal Energy Price included in the market price shall be based on average historic Spill Prices, with Spill Prices derived as calculated under the current version of the Code. The averaging mechanism is set out in Attachment 1 below.
- 3.5 The capacity component (i.e. LOLE * VOLL) of the market price shall be calculated on a non-rolling week-ahead basis. For example, on day t the capacity component will be known for day t to day t +6 and on day t+5 the capacity component will be known for day t+5 to t+6.
- 3.6 The Loss of Load Expectation (LOLE) values shall be calculated in accordance with Attachment 1 below.
- 3.7 The Value of Lost Load (VOLL) shall be set at €7,550 per MWh, based on the annuitised capital cost of an additional peaking plant.

4. Provision of Information

- 4.1 The following data should be made available on a trading period or other basis as specified below:

- Ex-Ante Unit Nomination (ANOM) – half hourly MW
- Ex-Post Unit Nomination (XNOM) – half hourly MW
- Instructed Quantity – half hourly MW
- Actual Generation – half hourly MW
- Incremental and Decremental price bids (1,2, 3 & 4 INC and DEC bids) – half hourly € per MW
- INC and DEC Price Breakpoints (BPP 1,2,3 & 4) on a MW basis
- Start-up Costs/Price Bids on a € basis

These terms are defined in the Code (which can be found at <http://www.cer.ie/tscode.htm>). This unit specific information is provided to the TSO by the generator (or to the generator by the TSO if an instruction) on a half hourly basis. This information will be published for all centrally dispatched or trading generators on a generation unit basis without exemption.

Background

The Commission is currently reviewing the pricing arrangements, as required by the Minister for Public Enterprise's Policy Direction on Trading in Electricity issued on 26th July 1999. The Direction states that, if the current pricing arrangements are found to be inadequate, when compared with the stated objective for the trading arrangements, the Commission may change them. The objective of the trading arrangements is the promotion of "efficient competition amongst licensed generators and suppliers within the market segment being opened to competition."

On 11th January 2002, the Commission published a consultation paper, Review of Pricing Arrangements Under the Trading and Settlement Code (Ref.: [CER/02/07](#)), and invited comments on a number of suggestions ranging from maintaining the status quo to amending imbalance market prices. The Commission held an open forum on 26th February 2002 to give interested parties the opportunity to discuss with the Commission the various points raised in the consultation paper.

In the consultation paper, the Commission expressed its concern at the continuing apparent lack of interest by potential generators in the Irish electricity market and took the view that the characteristics of the Irish market were such that it appeared difficult for interested parties to enter and compete effectively. Moreover, the initial interest in the Irish market seems to have diminished over time and the departure of potential private investors over the past two years has dented the confidence of both investors and eligible customers alike.

While this is in all likelihood the result of a number of factors, the Commission was of the view that the structure and level of prices in the imbalance market (i.e., top up and spill prices) did not appear to be conducive to the promotion of market entry by new participants, which is a necessary prerequisite for efficient competition.

Many market participants, attending the 26th February open forum, echoed the view of the Commission, which was further supported by the initial findings of NCB Corporate Finance in their review of Barriers to Private Investment in the Irish Electricity Market¹.

Against this background and as a first step to promoting efficient competition between generators and suppliers in the competitive market, the Commission has provided a number of suggestions in relation to top up and spill pricing. In brief, the Commission proposes that in any particular trading period there should be only one price for energy and that this price should be set, to the greatest extent possible, by market forces.

The Commission has also considered the role of Green/CHP generators and suppliers in the market and acknowledges their concerns regarding any changes that may be made to the pricing arrangements. Mindful of its statutory function to promote the use of renewable, sustainable or alternative forms of energy and given the characteristics of the technology, the Commission considers that the current pricing arrangements should continue to remain in place for Greens and CHP participants.

¹ For further details please refer to the Commission's website at the following link <http://www.cer.ie/1101Archive.htm>. .

In addition, the Commission is concerned about the lack of information available to existing and potential market participants to enable them to judge the appropriateness of prices in the imbalance market and to predict the behaviour of prices over time. Currently the precise calculation of the spill price is unclear and parties do not have access to the necessary inputs used in its calculation. It is felt that this makes it more difficult for parties to estimate the future pattern of imbalance market prices, which is of importance when making generation investment decisions.

Separate to this review of market prices, the Commission has received representations about the availability, to all market participants, of generation unit information. This matter was referred to the Trading and Settlement Code Modification Panel. The Panel has recommended that certain individual generator unit information be made available in the public domain.

Accordingly the Commission is minded to improve access to information and to require the TSO publish certain categories of information as soon as possible after the trading day.

The Commission considers that the suggested changes are a necessary but not sufficient measure in themselves to encourage market entry and thereby efficient competition between generators and suppliers in the market. The Commission has also decided to finalise the high level principles of the 2004 review of the overall trading arrangements by the end of 2002.

Attachment 1: Market Price Principles

This attachment summarises an approach that can be adopted in determining of the market price.

Definition of “Week-Ahead”

The run is strictly week-ahead and not rolling week-ahead. The “week” need not be a calendar week (Sunday to Sunday or Monday to Monday) but may be any fixed seven-day period and could be from mid-week to mid-week. This seven-day period is referred to below as the “study period”.

Calculation of LOLE

1. LOLE will be calculated using PROSYM (the EPUS engine). It is probable that hourly (rather than half-hourly) LOLE values will be derived.
2. Mid-range week-ahead demand forecasts are to be used. This forecast will exclude price elasticity and PowerSave effects but will include an allowance for Turlough Hill pumping. It will give demand values for each hour of the study period.
3. Week-ahead availability values to be based upon a “week-ahead” declaration from Generators (this to take account of the expected outage programme and fuel availability). This “week ahead” declaration will provide a MW value for each hour of the study period, as described in points 5 through 6 below and will be submitted in electronically in a format to be determined by ESB NG.
4. All dispatchable Generation shall give forecast availability MW values for each Generating Unit for each hour of the study period.
5. Non-Dispatchable Generation (whether Participants or not), above a 2MW de-minimis site limit, to give a “week-ahead” declaration. This will be included as part of the total generation (rather than being taken off the demand) provided that no unforeseen problems are found for this approach. The declaration will cover:
 - a. For all other than windfarms, a declaration of the expected MWs of output that will apply for each hour over the study period; and
 - b. For windfarms, a declaration of the expected MWs of availability that will apply for each hour over the study period.
6. For embedded non-dispatchable generation, which does not currently provide availability data (to the TSO or DSO/PES) an interim solution will be adopted whereby an estimate will be used based on the installed capacity of each generator and assumed forced outage rates.

As more information becomes available in the future this interim solution can be reviewed.

7. Forced outages based on the following:
 - a. For all units other than windfarms, an average forced outage rate over all units (perhaps differentiated by age) – values based upon actual figures available to ESB NG); and
 - b. For windfarms, an additional allowance is made for wind variability.
8. Hydro availability is to take account of energy limits. This energy limit will either be based upon the “Hydro Standard Running Year” values or on the actual values obtained for the last week.
9. Hydro and Pumped Storage capacity to be scheduled to peak shave.
10. Interconnector capacity based upon availability of actual interconnection (taking into account, where necessary, of known outages of plant in Northern Ireland).
11. Hourly LOLEs will be produced (rather than half-hourly LOLEs). It should be noted that due to the differing time horizons and data requirements involved. These LOLEs will not necessarily map directly to those calculated for other generation adequacy purposes.

Value of Lost Load

The Value of Lost Load is estimated at €7,550 per MWh, based on the cost of an additional peaking plant.

Marginal Energy Price

The Marginal Energy Price shall be based on average historic Spill Prices. The average Spill Price is calculated as follows (where “week w” is the week for which the Marginal Energy Prices are to be determined and “Trading Period h” is a Trading Period within a week).

1. If the day in week w is a Business Day, the Marginal Energy Price for Trading Period h is set equal to the average of all Spill Prices in Trading Period h in all Business Days in the last two weeks for which Spill Prices are available.¹

¹ In fact, to get two versions of each day of the week for Business Days, it is necessary to cover three weeks. See “Timetable”.

2. If the day in week w is a Sunday or week day non-Business Day, the Marginal Energy Price for Trading Period h is set equal to the average of all Spill Prices in Trading Period h in all Sundays and week day non-Business Days in the last four weeks for which Spill Prices are available.
3. If the day in week w is a Saturday, the Marginal Energy Price for Trading Period h is set equal to the average of all Spill Prices in Trading Period h in all Saturdays in the last four weeks for which Spill Prices are available.

Attachment 2: Calculation and Use of Market Prices

LOLE is calculated for each hour. For any Trading Period the LOLE for the hour in which that Trading Period occurs is used. Thus, in any one-hour, the two Trading Period LOLE values are identical.

The Market Price ($MKTP_h$) is to be determined as follows:

$$MKTP_h = MEP_h + (LOLE_h \times VOLL) \text{ where:}$$

$LOLE_h$ is the Loss of Load Expectation for Trading Period h , $VOLL$ is the Value of Lost Load €7,550/MWh and MEP_h is the Marginal Energy Price for Trading Period h .

The Secondary Price will not be directly used in Settlement. In Settlement the Secondary Price should apply in 11.4.1 and 12.4.1 which currently have equations of the form:

$$ZBIP_h = (\max[ZBI_h, ZENT_h] \times TU_h) + (\min[ZBI_h - ZENT_h, 0] \times \max[XTU_h \times TUM_h, SP_h])$$

If the Secondary Price were to be specifically used, this equation would read:

$$ZBIP_h = (\max[ZBI_h, ZENT_h] \times TU_h) + (\min[ZBI_h - ZENT_h, 0] \times \max[SNDP_h, SP_h])$$

Where $ZBIP_h$ is the Genco or Supplier Bilateral Imbalance Payment, ZBI_h is the Genco or Supplier Bilateral Imbalance, TU_h is the Top Up Price, XTU_h is the Ex-Ante Top Up Price, $SNDP_h$ is the Secondary Price, SP_h is the Spill Price and TUM_h is the Top Up Price Multiplier.

In order to reduce the changes necessary to the Settlement System, TESS, it is proposed that the Top Up Multiplier TUM_h is set such that: $XTU_h \times TUM_h = SNDP_h$

The Top Up Multiplier (TUM_h) for Trading Period h is therefore determined to be:

$$TUM_h = SNDP_h / XTU_h \text{ where } XTU_h \text{ is the Ex-Ante Top Up Price.}$$

Timetable

The following week-ahead timetable could be adopted:

1. Week-ahead declarations to be submitted by 10:00 hours on a Wednesday
2. Market prices to be published by ESB NG by 16:00 hours Thursday
3. Market prices to apply from 00:00 hours on the next following Saturday to 24:00 hours on the Friday following.

Extracts

The “Week-Ahead Prices Extract” will be issued to the CER and all Participants. The extract will report the following values for each Trading Period in the week:

1. Demand (MWs or MWhs) per Trading Period
2. Availability (MWs or MWhs) per Trading Period
3. Loss of Load Expectation ($LOLE_h$)
4. Value of Lost Load (VOLL)
5. Market Price ($SNDP_h$)