



**REVIEW OF PRICING ARRANGEMENTS UNDER THE  
TRADING AND SETTLEMENT CODE**

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# **1. Executive Summary**

## **Background**

The Commission is currently reviewing the pricing arrangements (as set out in the Minister for Public Enterprise's Policy Direction issued on 26<sup>th</sup> July 1999). If the 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."

The Commission intends to interpret the objective of promoting efficient competition in terms of the effect of a change in the pricing arrangements on:

- entry by generators and suppliers who are considering entering the market;
- the trading between these parties where they are already established in the market; and
- the sustainable level of prices to customers.

Interested parties have made a number of comments about the effectiveness of the current electricity trading and pricing arrangements. It has been suggested that the contracts market is difficult to enter and to compete in effectively as the non-eligible market (i.e., the PES market) is closed to the independent sector and there is a limited number of eligible customers with whom to contract. In these circumstances, new entrants look to the imbalance market, and especially spill, to support new entry. But it was argued that the spill price is too volatile; insufficiently transparent; not reflective of the value of capacity in the market; determined by the dominant generator in the market and unknown at the time of trading. Moreover, it is suggested that substantial risk is created by the rule that spill prices fall to the level of a BNE's avoidable fuel cost if spill exceeds, in any trading period, 25% of total eligible customer demand.

## **Options for Change**

The Commission is minded to change the pricing arrangements where it deems that current arrangements are insufficient to enable market entry by efficient generators. The Commission is attracted by the option of narrowing the differential between the top up and spill prices by adding a capital contribution to capacity to the currently calculated spill price. However, the Commission notes that any increase in the value of spill electricity results in additional costs that need to be

recovered. In addition, the Commission is of the view that market participants should be encouraged to contract for the sales of electricity rather than using the imbalance market as the primary trading mechanism.

Thus the Commission considers that access to this higher spill price could be limited to one half of a new non-green, non-CHP generator's registered capacity in year 1 and one quarter in year 2. In the third and subsequent years, energy spill could be traded out at the 'base' spill price (i.e., ESB's avoidable fuel cost). The Commission is also minded to set the secondary top up and the higher spill price closer to real time to give participants an incentive to enter into bilateral contracts; abolish the 25% of eligible customer demand spill limit and make no change in arrangements applying to green and CHP generators and suppliers.

The Commission believes these changes, if implemented, would encourage new entry, promote competition among independent generators and suppliers and be of ultimate benefit to all consumers of electricity in the longer term. The Commission is also of the view that an alternative approach would be for ESB Public Electricity Supply to purchase some of its demand requirements from non-ESB generators. However, Regulation 31 of S.I. No. 445 of 2000 provides generators with very little opportunity to sell to PES prior to February 2005.

Interested parties are invited to comment on the issues raised in this paper by 4<sup>th</sup> February 2002. Submissions should be forwarded to:

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## **2. Introduction**

In a Direction issued on the 26<sup>th</sup> July 1999, the Minister for Public Enterprise set out the Government's policy on how the transitional electricity trading system in Ireland would work (see Attachment I). Following a public consultation process and a number of public meetings final proposals were published in January 2000. The details of these trading arrangements are set out in the Trading and Settlement Code.

### **Review of Pricing Arrangements**

The Commission is required by the Minister's direction to undertake, over the next few years, a review of the:

- effectiveness of the pricing arrangements, in 2002; and
- overall trading arrangements early in 2004, with a view to introducing, after completion of the transitional period, appropriate wholesale market arrangement applying equally to all bulk electricity generation and supply in Ireland.

If the pricing arrangements are found to be inadequate in the 2002 review, when compared with the objective of the trading arrangements, the pricing arrangements can be modified by the Commission. 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.

The Commission initiated the pricing review in September 2001, largely in response to market participants' concerns about market conditions. It began with the Commission inviting interested parties to submit comments on the current pricing arrangements. The Commission has developed this consultation paper in the light of these sets of comments and of the requirement to undertake a more complete review of the trading arrangements in the near future.

The Commission intends to commence the second review, on the trading arrangements themselves, in 2002. This will allow both extensive consultation with interested parties and the timely introduction of any changes to the current trading arrangements after the completion of the transitional period (i.e., February 2005).

As part of a separate exercise the Commission has recently appointed the financial services group NCB to undertake an assessment of the viability of the current structure from the perspective of potential IPPs considering whether or not to enter the market.

## **Issues to be taken into consideration**

The Commission intends to interpret the objective set out in the Minister's direction, of promoting "efficient competition amongst licensed generators and suppliers within the market segment being opened to competition," in terms of the effect of a change in the pricing arrangements on:

- entry by generators and suppliers who are considering entering the market;
- the trading between these parties where they are already established in the market; and
- the sustainable level of prices to customers

Attachment II of this paper describes the current pricing arrangements within the context of the existing structure of the electricity market. Section 3 judges the effectiveness of current pricing arrangements while the final section of this paper sets out a number of approaches that may be adopted to meet the objectives more effectively.

### **3. Effectiveness of Pricing Arrangements**

#### **Introduction**

This section of the paper examines the effectiveness of the current imbalance pricing arrangements in meeting the overall objective of the Minister's Policy Direction, namely the promotion of efficient competition amongst licensed generators and suppliers within the market segment being opened to competition, as interpreted by the Commission.

#### **Market Entry and Trading by Generators and Suppliers**

##### ***1.1.1. Contract Market Entry and Trading***

The effect of imbalance market prices (i.e. top up and spill prices) on market entry should be considered in relation to the structure of the overall market and the allocation of risk within the market.

The current market was intended and is structured to operate as a bilateral contracts market, with a market in imbalances to clear mismatches between contracted generation and actual generation or contracted supply and actual load. There is an assumption that the bilateral contracts market is sufficiently liquid to allow efficient licensed generators to contract with licensed suppliers and to earn a reasonable return on their investments.

If it is assumed that such generators have contracted the bulk of their output to suppliers and suppliers are adequately covered to meet the demands of their customers (in aggregate, if not on an individual basis), then the prices in the imbalance market are of secondary importance to these market participants. These imbalance prices simply operate to clear minor variations between generators' output and suppliers' demands. In this case, the way in which top up and spill prices are set should not impact greatly on the promotion of efficient competition. Competition takes place primarily in the contracts market. Entry will be conditioned by the characteristics of the contract market.

However, comments from existing and potential market participants suggest that the contracts market is difficult to enter and compete in effectively. When the England and Wales market opened, for example, potential new entrant generators could approach twelve supply companies (each with an established and relatively long-lived franchise customer base) to secure sales contracts to underpin the financial security of their projects. As a result, for a number of years,

almost non-incumbent generators entered the English and Wales market with the assurance of long-term sales contracts with supply companies.

With the current arrangements in Ireland, new independent generators seeking to sell the output from their plant may find contracting difficult, because:

- there is a limited number of eligible customers in the market. The number will rise to some 1,600 in February 2002, when about 40% of the market (by energy volume) will be open to competition. It can be expected that some of these customers will remain with ESB for a variety of reasons (including inertia and because the costs of switching outweigh any price differential). As more generators enter the market (beyond the two currently expected to be operational by end-2002), they are likely to find it increasingly difficult to secure an adequate eligible customer base for the sale of all their output, at least until the market is opened fully in February 2005; and
- these generators do not currently have the opportunity to sell output to PES. According to Regulation 31 of S.I. No. 445 of 2000, PES can be supplied only by PG “in the first instance.” The Commission interprets this as meaning that PG has the right to supply all PES’s net demand requirements to the extent that PG has output available from its currently owned plant.
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Taken together, these features of the market are viewed by a number of respondents as presenting new entrant generators with a significant level of uncertainty regarding their future electricity offtake.

On the supply side, there is a concern about the dominance of ESB in the total market and the difficulty (perceived or otherwise) of encouraging customers to switch from PES to other suppliers. Recent developments may have mitigated these concerns. ESB has recently auctioned 600MW of VIPP capacity to licensed suppliers. The discount of VIPP prices on PES prices and the recent PES tariff price increases provide suppliers with a greater opportunity to develop a customer base in advance of market entry by new entrant generators. The VIPP scheme is viewed as a short-term measure as suppliers are expected to relinquish their VIPP contracts once the IPP with whom they contract enters the market. The Commission is of the view that some amount of VIPP capacity should continue to be available until a third IPP enters the market.

It should be noted that as the size of the eligible market increases (and the average customer size reduces), the cost for suppliers to serve the market increases, for two reasons:

- smaller customers generally have lower load factors and in aggregate their contribution to peak would be higher. This is exacerbated by the fact that the metering is such that they can not respond to peak pricing signals. This increases the contracting risk for a baseload generator, since ESB will in all likelihood continue to be the monopoly supplier of mid-merit and peaking generation, which the new entrant can under current arrangements access only through the imbalance market, compared with a baseload generator with a predominantly baseload demand;
- billing and revenue costs are higher for smaller customers because the associated costs are spread over a smaller number of units consumed. So, as customer numbers increase suppliers will face the need to invest in a substantial billing system (probably post February 2005 when the market is fully liberalised). This level of investment was viewed as a barrier to entry in the England and Wales market.

While ESB's VIPP scheme provides some assistance to suppliers who ultimately wish to purchase directly from generators, it does not help suppliers who do not expect to contract with a particular generator. Such suppliers may look to purchasing from a number of sources, including the imbalance market.

### **I.1.2. Imbalance Market Trading**

In these circumstances some parties, including potential new entrants, look to the imbalance market to provide sales opportunities to supplement sales to licensed suppliers or to top up with mid-merit and peaking generation. For example, it has been suggested that the imbalance market should be considered as a mechanism to offset some of the risk faced by potential generators in the contracts market, by providing the generator with some level of assurance about revenue that can be earned. Thus there is a view that the imbalance market should be used to make up for the perceived shortcomings of the bilateral contracts market – a use that was not originally anticipated by the Minister's Policy Direction.

The current mechanism for setting top up prices results in a price that is calculated *ex ante* (i.e., set in the form of a tariff) and is relatively stable (i.e. does not change once set at the beginning of the year). A generator's and a supplier's ability to purchase top up is limited. A secondary top up price operates for supplies in excess of these limits

and is currently set as a multiple of the published top up price. It exhibits the same stability as the top up price.<sup>1</sup>

The spill price is by comparison unpredictable. It is calculated *ex post* and depends on market conditions at the time. It is currently determined by the decremental price bids offered by PG's marginal plant.

Respondents made a number of comments about top up and spill prices. These are summarised in Appendix III. In short, some respondents considered that a generator's top up allowance should be reviewed because, as currently operated, it increases generators' costs on outages. Others noted that the top up price does not reflect market conditions, as it is calculated *ex ante* and set as an annual tariff.

Respondents also suggested there are a number of problems associated with spill prices. They are viewed as being volatile and insufficiently reliable or transparent to provide financial security to new generators. In addition, they are not considered as not reflecting the value of capacity in the market, determined by the dominant generator in the market and unknown at the time of trading.

In addition, respondents argued that the second tranche spill price should not fall to the level of the BNE's fuel costs. It was suggested that this price uncertainty increases risks for new generators and thus inhibits entry. Other respondents considered the spill pricing regime to be generous when compared with other markets.

### **3.3 Sustainable Level of Prices to Customers**

The effectiveness of the current pricing arrangements also needs to be considered in the context of delivering a sustainable supply of reasonably priced electricity to customers.

Customers can expect to obtain reasonably priced electricity in a competitive market that is characterised by a sufficient number of trading suppliers and generators, where entry and exit is relatively free and where the market has a significant level of interconnection with other markets and/or a surplus generation capacity in the home market. In this type of arrangement the normal rules of supply and demand could be expected to apply to price setting. As seen in Attachment II, the Irish market does not currently have this structure. In addition, respondents have suggested that the market is perceived

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<sup>1</sup> The Commission has reviewed the calculation of the secondary price but has delayed publication of its final proposals until the completion of this review.

as presenting a high level of risk to some generators considering market entry.

Based on comments from interested parties, it can be argued that future prices to customers in the independent sector could be higher than would otherwise be the case. The financial risks faced by new and established market entrants (in terms of the lack of liquidity in the contracts market and uncertain/inadequate imbalance market prices) may raise the cost of capital and lead to higher prices to customers than would arise in a lower risk/higher volume market. The extent to which customers may benefit if imbalance prices are amended to facilitate market entry depends upon the precise change to the pricing rules and the treatment of any additional costs that may arise as a result of such change. Clearly there needs to be a balance between the interests of the various parties in the market and customers.

### **3.4 Summary**

Much of the assessment of the effectiveness of market arrangements is inevitably subjective. However, the comments received by the Commission from interested parties suggest that the initial interest in the generation market seems to have diminished. This is a matter of concern to the Commission. Promoting efficient competition in the independent sector (and thus the promotion of reasonably price sustainable supplies to customers) requires that the market arrangements can sustain new entry.

Some interested parties have concluded that the contracts market is not sufficiently liquid to sustain the commercial operation of efficient generators and have therefore focussed on imbalance market prices to provide generators with some assurance on the ability to earn reasonable revenues from the market. Accordingly parties have commented that the spill price should be less volatile, more reliable, known in advance and include a capacity value.

The Commission is concerned, not only that the contracts market is viewed as being inadequate, but also that parties seek to use the imbalance market as a wholesale mechanism. The Commission is of the view that a gross pooling arrangement would not be suitable currently for the Irish market, as the market is shallow with little independent generation (i.e. insufficient access to generation), no major interconnection and no spare generation capacity. In addition, the Commission would inevitably be required to engage in intrusive bid price regulation, given the dominant presence of a single company owning a large portfolio of price-setting plant.

The Commission is of the view that any proposed modifications to the contracts market structure are the subject of the next market review (required by the Minister's Policy Direction). The Commission plans to initiate this review in 2002. If, after the completion of this review, the Commission considers that modifications to the market structure are appropriate, these may be implemented after February 2005.

Ultimately, the interests of new efficient generators and suppliers wishing to establish and trade in the market are complementary to the interests of customers. Mindful of the balance that needs to be maintained between the interests of the various parties in the market and customers, the Commission is prepared to consider amending the current pricing arrangements where it is clear that they do not at present promote efficient competition in the independent sector. Options for change are presented in the next Section.

## **4. Market Approaches**

### **4.1. Introduction**

The conclusion to Section 3 stated that the Commission was prepared to consider changes where it is clear that the current pricing mechanisms do not promote efficient competition in the independent sector. This section of the paper puts forward a number of different approaches that may be implemented. These do not represent an all-inclusive list of possible changes. It is intended that interested parties should submit comments on the approaches set out and/or to provide the Commission with alternative suggestions for consideration.

### **4.2. Maintain Status Quo**

One approach would be to retain the current calculation of top up and spill where it is assumed that the current bilateral contracts market and imbalance pricing regime is adequate. A fundamental review of the market should then be initiated next year for implementation (as required) after February 2005. This may be an option where it is believed that:

- (a) efficient generators and suppliers can successfully enter the market and compete against PES's tariffs to attract customers to change supplier;
- (b) there are a sufficient number of eligible customers willing to change supplier to provide efficient generators and suppliers with a reasonably secure revenue stream; and
- (c) spill prices are sufficiently high for the sale of excess output to PG.

While this approach has the advantage of simplicity, it appears to be a view that is not shared by many parties judging from comments received by/made to the Commission.

### **4.3. Status Quo and Accelerated Market Opening**

Under the Electricity Regulation Act, 1999, the Minister has the option of amending the definition of an eligible customer. The Minister could decide to liberalise the market at a faster rate than currently anticipated. This would provide suppliers with greater opportunities to develop customer bases that in turn may encourage increased market entry by generators. Generators may then not need

to depend upon the imbalance market to provide a reasonably reliable revenue stream.

Full market opening is not a practical option in the immediate future. There are currently about 1½ million potential customers and the metering and settlement services required to support this possible level of trading activity are not currently in place. But the market could be opened more quickly than is currently envisaged. Adequate metering and settlement arrangements could be implemented, by the end of 2003, to allow all non-domestic customers (totalling an estimated 150,000) at that time to be defined as eligible.

#### **4.4. Status Quo and Sales to PES**

In this case PES would, as an interim measure, have an economic purchasing obligation for specified amounts of output. PES could invite tenders from generators in the independent sector. Under this arrangement, the successful generator(s) could rely on PES for a limited source of reasonably secure revenue (depending upon the performance of the generator).

This would have the advantage that (successful) generators would not need to look to the imbalance market for revenue security. The Commission considers that this may be a reasonable approach, in the short term, to facilitate market entry by efficient generators.

However, this may not be an appropriate longer-term measure as it would have an adverse effect on competition in the supply market.<sup>2</sup> In addition, Regulation 31 of S.I. No. 445 of 2000 largely precludes non-ESB generators from contracting directly with PES. Even if PES did but from these generators, it might result in unrecovered costs for PG. PG would recover a lower contribution towards its allowable capital costs than expected. This cost would either have to be borne by ESB itself (in the form of lower profits) or passed through to PES customers.

#### **4.5. Revised Imbalance Market Prices**

In this arrangement, the calculation of the top up and spill price would be amended to provide generators with some revenue security. There is a range of possibilities that can be considered.

##### **4.5.1. *Differential between Top up and Spill Prices***

Currently top-up and spill prices are not calculated on the same basis. Two imbalance prices can be beneficial as they provide an

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<sup>2</sup> <http://www.cer.ie/cer01100.pdf>

incentive for parties to enter into contracts, thereby encouraging competition in and adding liquidity to the physical contracts market, which is where the majority of energy was intended to be traded. Encouraging contracting is also consistent with the original concept of a bilateral contracts market design.

However, this arrangement assumes that the bilateral contracts market has reached a stage in its development that provides adequate liquidity to support trading. The point has been made that the contracts market does not provide sufficient liquidity and that significant volumes of energy consequently need to be traded through the top up and spill mechanism. It has been argued that the disparity between top up and spill prices will inhibit trade and thus market entry. This is of concern to the Commission.

Recent studies suggest that the time weighted average 2002 top up price is €45.25/MWh of which some 91% or €41.04 /MWh is assumed to be ESB's estimated avoidable fuel cost. This can be viewed as a proxy for the spill price. The value of capacity was estimated to be €4.21/MWh, equivalent to 9% of the top up price. Some parties suggest that spill prices in this range are *not* sufficient to support a project prior to the generator fully contracting its output to a supplier.

If it is clear that the spill price is so low that it deters market entry, some capacity value could be included in the spill price to provide a degree of revenue assurance to generators while at the same time maintaining the incentive on generators to contract with suppliers for the sale of output. The capacity element of the spill price could be set at a level such that the spill price tends towards the best new entrant price. For example a higher spill price could be set to include half the capacity value included in the top up calculations. In other words the spill price could include a capacity element of €2.10/MWh – profiled over time. Alternatively as the gap between the top up price and the spill price, in the above calculation, is very small, it might be argued that the full top up value of capacity should be included in the spill price.

A higher spill price would allow generators earn a reasonable revenue stream thereby, encouraging entry. It would be a reference point for those considering entering the market.

#### **4.5.2. Time scale for Setting Prices**

Setting prices can be carried out in three ways, ex ante, in real time or ex post:

- *ex ante* prices are set before the specified period (whether a trading period or some longer period of time) and then fixed until and during the period. Before the recent reform, prices in

the England and Wales market were set a day ahead of real time;

- real time prices are set during the trading period;
- ex post prices are calculated after the trading period, as in New Zealand.

The current *ex ante* top-up price in Ireland has the benefit of sending a clear signal to the market and providing certainty. However it has the disadvantage of not necessarily reflecting the true value of electricity at the time of consumption. Setting prices *ex ante* is, in theory, inefficient as the risk of the prices being incorrect increases over time.

By contrast, the spill price is currently set *ex-post* and is therefore a closer reflection of the costs of power on a trading period basis. But, market participants are required to trade at this price without knowing what it is. This increases risk.

The Commission is considering approaches where the secondary top up price is set closer to real time. The same approach could be adopted for the higher spill price (i.e. if and where the spill price includes a capacity element). In this way, prices in the balancing market would more closely reflect conditions in the market at the time electricity is generated and consumed. This will increase efficiency although it does have the effect of increasing pricing uncertainty for market participants.

#### **4.5.3. The Spill Cap**

Currently, the independent sector can sell spill to PG at PG's avoidable fuel cost for an initial tranche of 25% of total eligible customer demand. The case has been made to the Commission that the spill cap distorts price transparency and clarity. Parties cannot be assured of getting the first spill price, as the price is dependent on the total amount of spill in the market, which is beyond an individual generator's control. The nature of the spill cap is such that as further generation is spilled and the cap is exceeded, the price is depressed below the highest decremental bid, which is a proxy for marginal cost.

It has been suggested the spill cap should be raised:

- to the level of energy consumed by the eligible customers available to purchase electricity from the IPP; or
- to the amount of consumption of the eligible market as a whole.

Another possibility would be to remove the cap and permit parties to spill as much as they top-up. But this could be difficult to implement.

It would also require a decision about what price to apply, in particular if an individual party spilled more than it topped up over the given period.

Alternately it may be appropriate to remove the spill cap completely. In this case, the spill price never falls below the highest decremental bid. The Commission is minded to adopt this approach, as the marginal cost of production is a reasonable estimate of the variable costs that PG does not incur as a result of purchasing spill output. There is weight in the argument that PG should not benefit from the purchase of spill output to the extent that a generator's spill payment is less than the additional cost that PG would incur to produce the same unit of output.

#### **4.5.4.        *The top up cap***

Currently generators and suppliers can purchase a limited amount of top up priced supplies. It has been suggested that the application in terms of trading period of the generator's limit should be revised, on the grounds that the current calculation leads to increased generator costs while on outage.

It would be possible to amend this mechanism to allow a generator access top up priced supplies while on outage (assuming an average 8% outage) and to allow a generator to carry forward any "entitlement" not used in a previous year or advance any "entitlement" from a future year. However consideration needs to be given to the cost and time that may be required to implement this type of arrangement. The Trading and Settlement Code Modification Panel is currently considering this issue and the Commission will consider the recommendations of this Panel.

#### **4.5.5.        *Setting Imbalance Prices***

The principles outlined above may be combined in many different ways to arrive at a set of imbalance prices. This section outlines one possible combination.

##### *Top up*

Top up is calculated in the same manner as set out in the Trading and Settlement Code; i.e. ex ante estimate of ESB avoidable fuel cost plus an ex ante estimated value of capacity (profiled by time of day) where the annual top up price averages the full cost of the best new entrant. ESB's avoidable fuel cost is a proxy for the marginal energy value or the spill price. This price could be reviewed on a regular basis and revised if necessary.

Generators and suppliers continue to have their current entitlements to purchase top up supplies.

### Secondary Top up

Currently secondary top up is calculated as a multiple of the top up price. This could be amended to better reflect market conditions on the day. The price could be calculated as the ex post marginal energy price (the current calculation of the spill price) plus a capacity element. The capacity element could be calculated on an ex ante basis. On day 1 the Transmission System Operator (using most recent information provided by the market) could derive Loss of Load Expectations for the following 7 days. These values could be multiplied by the Value of Lost Load to provide time of day capacity values for the week ahead. These capacity values could be added to the ex post energy price to arrive at a secondary top up price. This calculation would be repeated once a week to provide an on going ex ante 7 days ahead set of capacity values.

The current rules for the generator and supplier access to secondary top up supplies could continue to apply.

### Secondary spill price

The secondary spill price would contain an energy component and a capacity component. The energy component would be calculated in the same way as the current spill price; i.e. set ex post and based on the decremental bid prices of generators. The capacity element could be set ex ante to match the capacity element of the top up price.

Given that the current market is a bilateral contracts market, the Commission considers it appropriate that generators are encouraged to contract with suppliers rather than trade all output at the imbalance prices. Thus an approach to limit generator sales at secondary spill could be implemented. For example in the first year of operation, a generator may receive the secondary spill price for up to half of its capacity in each trading period. If a generator does not use this entitlement in a particular trading period, it is not carried over to the next period. In year two, a generator's entitlement falls to one quarter of its capacity. For each year thereafter the generator has no entitlement to the secondary spill price. This provides a generator with some revenue security in the early years of operation while at the same time encourages a generator to contract with a supplier for the sale of its output.

There does not appear to be a clear rationale for providing suppliers with access to the secondary spill price. This pricing arrangement is being considered in the context of market entry by generation. Suppliers have the opportunity to contract with generation for the sale of output to customers. Suppliers may avail of secondary priced spill

(if required) through their own contractual arrangements with generators.

### Spill

Once a generator has fully used its entitlement to secondary priced spill, any additional sales are priced at the standard spill price. This price is the same as the current *ex-post* spill price based on the decremental bids of generators. Suppliers face this price for all their spill sales.

The Commission is considering removing the rule that the spill price falls to the best new entrant's fuel price after the current 200 MW limit is reached. There is no strong justification for PG paying a price for spill purchases that are lower than PG's own marginal cost to produce the same output. This means that all spill sales (outside secondary spill sales) receive the same payment in each trading period.

### Green/CHP generators and suppliers

In this example, green/CHP generators and suppliers are not provided with access to the secondary spill or secondary top up prices, on the assumption that they have a better opportunity to trade amongst themselves to meet their requirements and that they avail of top up and spill to balance their sales and purchases.

This has the effect of creating two different imbalance regimes. Therefore it may be appropriate to consider if Green/CHP generators should also receive the secondary spill price for a proportion of output spilled in each half-hour period. However, this could mean that these generators should also face, in part, the secondary top up price.

### Interaction of market prices

In this example there are potentially four market prices. However, the energy components of the secondary top up price, the secondary spill price and the spill price are calculated on the same basis. Under the current trading and settlement rules, the top up price rises to meet the spill price where the spill price is higher than the top up price. This ensures that the energy is not purchased from PG only to be resold to PG at a higher price. Similar rules are required in the above example.

The secondary top up needs to be greater than or equal to ( $\geq$ ) top up  $\geq$  secondary spill  $\geq$  spill price. Unnecessary arbitrage may occur unless this sequence is maintained. As the energy component of the secondary top up, secondary spill and spill are all calculated on the same basis (and equal the spill price), the spill price cannot be higher

than the secondary spill or secondary top up prices. However, the top up price may be higher than the secondary spill price as its ex ante energy component is calculated on a different basis. Analysis of past top up and spill prices shows that the top up price has on occasion been below the spill price. Thus the above pricing arrangement may increase top up towards the secondary spill price. This problem could be removed if the secondary spill price were set to equal the top up price (ex-post).

The full ramifications of this approach to market pricing need to be considered in light of other market payments, e.g. capacity margin payments for generators and payments made by the Transmission System Operator in managing constraints.

#### Impact of Pricing Arrangements

Assuming trading occurs, any pricing arrangement that increases the price of spill creates an additional cost in the market (to the extent that the costs saved by PG by generating less are less than the price paid for spill, at the margin.) and this cost needs to be recovered. At the same time, the Commission has been advised that this type of arrangement is required to facilitate entry to the market.

The Commission is minded to introduce this arrangement (or some variant) if it is viewed as necessary for generator market entry and/or sustaining the operation of generators in the market. Another option would be for PES to purchase some output from non-ESB generation. However this does not appear to be an option as Regulation 31 of S.I. No. 445 of 2000 allows PES's requirements to be met, in the first instance, by output from existing PG plant.

#### **4.6. Conclusion**

This section of the paper sets out a number of possibilities ranging from maintaining the status quo to amending imbalance market prices. The arrangements presented are not an exhaustive list. The Commission welcomes the views of interested parties on any of the issues raised in this paper. In particular the Commission welcomes responses on whether or not the contracts market is operating effectively and whether or not imbalance market prices should be revised with a view to providing potential and actual market participants with a lower exposure to risk in relation to market revenues while at the same time providing customers with a sustainable supply of reasonably priced electricity and any other proposals on how this could be achieved.

## **Appendix I - Policy Direction - Trading in Electricity**

### **Introduction**

1. The following is a Policy Direction issued by the Minister for Public Enterprise to the Commission for Electricity Regulation in accordance with Section 9(1)(a) of the Electricity Regulation Act, 1999.

### **General**

2. The main objective of the trading arrangements is to promote efficient competition amongst licensed generators and suppliers within the market segment being opened to competition.

3. All suppliers (other than the Public Electricity Supplier) and all generators (other than ESB generating plant contracted to the Public Electricity Supplier) constitute the independent sector and will be subject to the same trading arrangements.

4. For a transitional period ending on 19 February 2005, a regime for the provision of "top-up" and "spill" will be introduced. Under this regime, the independent sector will be able to purchase power shortfalls ("top-up") from and sell power surpluses ("spill") to ESB Generation whenever the production of independent power producers does not exactly match the aggregate demand of the customers of the independent sector.

5. Generators and suppliers in the independent sector will be able to trade electricity amongst themselves at mutually agreed (i.e. unregulated) prices prior to settlement of aggregate "top-up" and "spill" with ESB Generation.

### **Pricing**

6. The independent sector will in all normal circumstances be able to purchase "top-up" from ESB (Generation) in sufficient quantity to provide adequate backup supplies to the independent sector at prices that average out over the year to the estimated full cost of a best new entrant (BNE). These prices will be profiled according to published ex-ante estimates of ESB's avoidable fuel cost, plus an extra capacity element weighted according to the expected loss of load probability (LOLP), at the appropriate time of day, week and season. The actual BNE price has yet to be determined.

7. The independent sector will be able to sell "spill" to ESB (Generation) at ESB's avoidable fuel cost for an initial tranche of 25% of total eligible customer demand. This is currently estimated to be approximately 200 MW in 2000/2001, but the figure will of course increase with eligible customer demand growth from 2001 and with further market opening in 2003. Any spill beyond the initial tranche

will be priced at the best new entrant's avoidable fuel cost, subject to a cap of ESB's avoidable fuel cost.

8. ESB Generation, once it has satisfied its regulated contract with the Public Electricity Supplier and the top-up requirements of the independent sector, will be allowed to enter into voluntary commercial arrangements with independent suppliers, including ESB Independent Supply, subject to regulatory oversight and normal competition rules.

### **Review**

9. Early in 2002, the Commission for Electricity Regulation will review the effectiveness of the pricing arrangements, which may be modified at that time if it is found that they are not meeting the main objective of the trading arrangements.

10. The Commission for Electricity Regulation will carry out a review of the overall trading arrangements early in 2004, with a view to introducing, after completion of the transitional period, appropriate wholesale market arrangement applying equally to all bulk electricity generation and supply in Ireland.

### **Next Steps**

11. The Commission for Electricity Regulation will consult on the detailed arrangement associated with the transitional trading regime in accordance with the Electricity Regulation Act, 1999.

## **Appendix II - Current Structure of the Electricity Industry**

### **Current Structure**

The Policy Direction issued by the Minister for Public Enterprise to the Commission in accordance with Section 9(1)(a) of the Electricity Regulation Act, 1999 (“the Act”) forms the basis of the bilateral contracts market for the trading of electricity in Ireland that was established on 19<sup>th</sup> February 2000. An imbalance market supports this bilateral contracts market.

For a transitional period, ending on 19<sup>th</sup> February 2005, the imbalance market comprises a top up and spill regime. Under this regime, all suppliers and all generators may trade amongst themselves and notify these trades to the operator running settlement (the Settlement System Administrator or SSA). However there may still be an excess, or deficit, of energy to trade after the parties have notified the SSA of all bilateral contracts. The generator or supplier is paid the spill price for excess energy, or charged the top-up price for a deficit of energy.

### **Top-up and Spill Prices**

The time-weighted top up price is calculated *ex ante*, as a tariff, and is set to be the average estimated Best New Entrant (BNE) cost for the year ahead. At present, suppliers are limited to purchasing at most 5% of their bilateral contract nominations and imports at top up prices and generators are limited to 8% of their registered capacity. Purchases in excess of these limits (secondary top up) are at a price set to reflect expected market conditions. Secondary top up prices are on average higher than the top up price. This is because the secondary top-up price is not constrained to equal the BNE price on a time-weighted basis.

Spill prices are calculated *ex post* with reference to ESB Power Generation’s (PG’s) avoidable fuel costs. Again there are limits on spill purchases by ESB at these prices. These prices operate for up to 25% of eligible customer demand (initially some 200 MW but increasing with growth and with further market opening in February 2002). Any spill sold by the independent sector beyond this tranche is priced at the BNE avoidable fuel cost, subject to a cap of PG’s avoidable fuel cost.

PG and ESB Public Electricity Supply (PES) do not operate in the imbalance market directly (i.e., they do not spill or top-up). PES is never in imbalance under the current arrangements. Any shortfall between PES’s demand and its contracted generation (such as

Edenderry Power Ltd and AER/Thermie type schemes) is deemed in settlement to be met by PES's purchase arrangements with PG.

Equally, PG cannot sell or buy imbalance energy to or from itself. However, PG can influence the level of the spill price, as this price is derived from the decremental bid price of PG plant at the margin in the unconstrained schedule. This will remain the case, if the current rules are maintained, until such time as a non-PG plant operates at the margin.

### **Retail Competition**

Licensed suppliers can contract with eligible customers. At market opening in February 2000, eligible customers were defined as those with an actual or expected consumption of 4 GWh or more a year. At that time, there were about 380 eligible customers, representing more than 30% of total system demand. There are now 416 such customers. In February 2002, the definition of eligibility will be extended to include customers with an estimated annual consumption greater than or equal to 1 GWh. This will increase the number of eligible customers to about 1,600. Their demand, together with that of existing eligible customers, will raise total eligible customer demand to about 40% of total system demand. Eligible customers may choose to purchase from independent suppliers or remain with PES.

In addition, licensed CHP and renewable, sustainable or alternative suppliers can sell to any end-use customer, irrespective of annual consumption. For the purposes of this paper renewable, sustainable or alternate production will be referred to as Green in accordance with the Trading and Settlement Code. CHP and green suppliers must balance their sales to customers with purchases of CHP or green electricity.

### **ESB Power Generation and PES**

Regulation 31 of S.I. No 445 of 2000 states that, until 19<sup>th</sup> February 2005, PES's demand requirements will be met in the first instance from generation stations owned at that time by ESB (December 2000). Thus, unless ESB agrees otherwise, licensed generators do not have an opportunity to sell output to PES except to the extent that PES's demand requirements exceed the output produced by PG. Representations have been made to the Commission concerning the possibility of IPPs selling output directly to PES. While the Commission considers that in the short term this may be a reasonable means of further developing competition in the generation market (although it does not necessarily lead to competition in the supply market), Regulation 31 appears to preclude this type of sales arrangement until February 2005.

When PG has satisfied PES's demand and the top-up requirements of the independent sector, PG is allowed to enter into voluntary commercial arrangements with independent suppliers. To date these voluntary arrangements have taken the form of Virtual Independent Power Producer (VIPP) auctions through which PG has sold energy under contract to licensed suppliers.

### **Demand Side Participation**

Demand cannot currently actively participate in the market although there are demand management schemes, such as Powersave, that the Transmission System Operator (TSO) operates in co-operation with some large customers.

### **Developments since Market Opening**

Since market opening there have been a number of developments in both the generation and supply markets.

### **Generation**

The Commission issued a direction to ESB National Grid on 19th June 2001 (relating to firm access to the transmission network) that has had the effect of providing centrally dispatched generators with greater certainty as to when they can participate in the market.<sup>3</sup> This new arrangement should facilitate the entry of licensed generators to the competitive market.

To date, the Commission has issued 44 licences accounting for a potential 1,196 MW of capacity, of which 751 MW represents two new large-scale generation plants, one built and operated by Viridian and the other by a joint venture between ESB and Statoil. Edenderry Power Limited (120 MW) is independently owned and all its output is sold to PES.

PG has estimated, in its revenue submission to the Commission, that in 2001 it would meet some 92% of the forecast total system demand of 23.5 TWh. By 2004, PG estimates its generation market share will reduce to 61% of system demand, assuming that there would be three IPPs operating in the independent sector by then (including the ESB/Statoil joint venture) and that there would be some growth in the green sources of generation. This figure of 61% excludes sales from Edenderry Power Limited and green generators to PES. ESB has stated its objective of reducing its share of the entire generation market to 60% by 2005. At present, the Commission does not have a clear view as to how ESB plans to achieve this objective.

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<sup>3</sup> Firm and Non Firm Access to the Transmission System - A Direction by the Commission for Electricity Regulation (<http://www.cer.ie/cer0172.pdf>)

## **Supply**

On the supply side, ESB has offered Virtual IPP capacity to suppliers licensed under Section 14(1)(b) of the Act. These suppliers can contract directly with eligible customers. This type of scheme allows suppliers build up a customer base in advance of real IPP output becoming available in the competitive market.

The Commission has so far issued 28 supply licenses. There are a number of suppliers currently active in the supply market(s) including: ESBIE, Energia, Bord Gáis, Duke Energy, Eirtricity, Glanbia and CHP Supply Ltd. Four of these suppliers purchased through ESB's VIPP auctions to sell onto eligible customers. The latest auction of 600 MW applied from 1<sup>st</sup> November 2001 and was over subscribed. The nature of the VIPP contracts means that these suppliers need not operate in the imbalance market to match their purchase and sales requirements. However, this will change when these suppliers contract directly with new entrant generators. The Commission understands that suppliers will relinquish their VIPP contracts as they purchase from IPPs. In this case, suppliers will be operating directly in the imbalance market.

Green and CHP suppliers also make use of the top-up and spill arrangements. They use the imbalance mechanism to meet their demand and balance this with Green/CHP production, which is spilled over the course of a period defined by the Commission.

## **Summary**

On the basis of this market structure, licensed generators can sell output (through suppliers) to eligible customers (and all customers in the case of green and CHP generated electricity), spill to PG and export across the Louth - Tandragee interconnector. Licensed suppliers have the additional opportunity of sourcing output from the VIPP auctions and of importing across the Louth - Tandragee interconnector.

Generator entry to date into the competitive market has been limited. Competition between non-green suppliers has been driven mainly by the availability of VIPP capacity. The top up and spill imbalance market arrangements have been of use to green generators in balancing their green purchases and their sales to customers.

## **Appendix III - Review of Pricing Arrangements under Trading and Settlement Code - Summary of Comments Received.**

### **Comments on Top Up**

One respondent noted that generators, during outage periods, must purchase the majority of their output at the secondary top-up price and this exposes it to significant costs. The independent generators have recently tabled a proposal to the Trading and Settlement Code Modifications Panel aimed at providing this 8% allowance to first tier top-up over a longer period of several years that reflect the maintenance cycle of a new generator.

Setting the top up price ex-ante means that it does not reflect actual market conditions. It was argued that it should therefore be based on actual generator bids to provide additional energy. Again as the price of electricity should in some way reflect the capacity situation, there should be a capacity component similar to that in the spill rate that reflects actual market conditions. This would effectively mean that the top-up price would be similar to, but slightly above, the spill price. In the event that the top-up price calculated in this manner actually fell below the spill price it should be reset to equal to the spill price.

A second respondent argued that the limits on access to top-up should be removed. Limiting the access to top-up restricts entry both in generation and supply. As the limitations to market opening are prescribed by Ministerial direction, this will not cause an undue opening of the market; rather it will make the eligible market more contestable and thus drive down prices. Also by allowing the top-up prices to be set by the market rather than ex-ante allows them to be responsive to actual market conditions thus promoting an actual competitive market. If the top-up price is based on the actual costs of providing that electricity then the provider of the Top-Up should not be financially disadvantaged.

Another respondent suggested that Top-up and Spill should be available only to generation plants and only up to their maximum rated capacity. This would eliminate the opportunity for gaming of the market by companies without generating capacity, while providing the liquidity that the generators need. Pricing for power purchased under Top-up and Spill should be the same, again eliminating the gaming of a market differential. The level of Spill should be raised to the level of power consumed by the eligible customers available to purchase electricity from the IPP. It has been suggested that the current arrangements do not provide for this to necessarily be the case.

One respondent expressed concern about the level of Top Up prices. The multipliers set out in the referenced CER Limits on Access to Top up are all above 1 where purchases of top-up exceed the top-up

entitlement; this results in the average price paid on a time weighted basis in a given year to be at least 15% higher than BNE. Accordingly, the current implementation appears to breach the Minister's Direction.

The respondent asserted that the latest figures for base Top-Up, i.e. those prices prior to application of the top-up multiplier, average out at a value about 3% higher than BNE. The respondent stated that each of the above factors has the effect of raising the spill price above the BNE average, in contravention with the Minister's Policy Direction. The net result is to increase the net revenue received by ESB in providing Top-Up beyond what was set out by the Minister.

### **Comments on Spill**

One respondent suggested that the current spill pricing mechanism creates serious difficulties for new generators in a small newly liberalised market. A new generator wishing to run at baseload may be unable to match the demand of a portfolio of customers and will be exposed to low spill prices. As the spill price is based on ESB's avoidable fuel cost the spill price may well be below the generators actual cost of generation and once the spill cap is reached, the price will be further depressed.

The spill cap also exposes potential new generators to increased risks, as they cannot be assured of getting the spill price, the price is dependant on the total amount of spill in the market. Therefore further market entry will suppress the spill price even beyond what is determined by decremental bids.

In assessing a large, capital-intensive project, such as construction of new generation plant, projections of revenue streams must be made. As the spill price is the only visible price in the market it is likely that project financing institutions will use this in assessing the viability of project. If this is deemed too low then the likelihood is that debt financing will not be achievable or will be only be available at increased rates due to the increased risk associated with the revenue stream.

In a constrained system the market should provide an indication of the value of new capacity based on actual market conditions and reward those who provide it. An alternative approach where the spill price contains a capacity element should be considered.

Another respondent commented that it was difficult to comment meaningfully about the validity of spill prices given the absence of information on the process used to calculate the avoidable fuel cost of ESB power plants, or even what those individual figures may be. The

generator constituents to the Trading & Settlement Code Modification Panel have argued vigorously that public availability of this trading information is key to a fair market and have undertaken to abide by the same rules of information disclosure.

The respondent's fundamental objection to the current spill prices is that they do not reflect the value of capacity in the system. The value of capacity in the system is a function of scarcity of that capacity. ESB NG in the recent [Generator Adequacy Statement 2001 – 2007](#)<sup>4</sup> has indicated that there is insufficient capacity in the electricity system.

The current price of Spill reflects only ESB's avoidable fuel cost. Fuel cost is only one of a number of costs associated with generation. The TSO will be paying for certain ancillary services which will address some of these costs, and the Trading and Settlement Code and the Grid Code contain various provisions to address other costs, for example start up costs.

However, the Commission is aware of the market's concern that the current Spill price does not adequately reflect the true value of spill as it does not contain a capacity element (Top Up does) or an evaluation of the value of capacity based on the scarcity of capacity in the current system. It has been suggested to the Commission that Spill provides to ESB a cheaper alternative to emergency generation and therefore ESB PG should pay a capacity element and not just the marginal cost of fuel.

### **Capacity Element in Spill**

One respondent noted that the CER recently published a paper on capacity margin but it will not encourage new entrants to build new capacity, which would typically require running at base load. Any generation capacity available on a power system (whether it is running or not) provides benefit to all users of the system in increased system security and stability and a reduction in the probability of a blackout. In the long run, as demand grows, a capacity signal should indicate to the market the need for new capacity and reward those who provide it. The capacity margin proposal by the CER arguably will not do this effectively

### **The Spill Cap**

Paragraph 7 of the Minister's Policy Direction states "the independent sector will be able to sell "spill" to ESB (Generation) at ESB's avoidable

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<sup>4</sup> Generation Adequacy Statement 2001-2007 published 8 May 2001 by Eirgrid

fuel cost for an initial tranche of 25% of total eligible customer demand.”

As noted previously, the spill cap also exposes potential new generators to increased risks, as they cannot be assured of getting the spill price, the price is dependant on the total amount of spill in the market. Therefore further market entry will suppress the spill price even beyond what is determined by Decremental bids. One respondent suggested the level of Spill should be raised to the level of power consumed by the eligible customers available to purchase electricity from the IPP.

### **Differential Between Top Up and Spill**

Under the current pricing arrangements there may be a differential in price between Top Up and Spill and as one respondent noted, if the top-up price is consistently below the BNE price then suppliers will buy top-up and new IPPs will find it more difficult to secure supply contracts. In addition the revenue they receive from spill (which as it must be equal to or below top-up) will not cover their costs, and hence this further reduces the chances of them entering the market.

In the medium to long term this difference has the potential to create capacity shortages due to the lack of new entry. However it should be noted that supply companies will seek to hedge their exposure to the market prices, thus the willingness of suppliers to enter into bilateral contracts with IPPs will be based on, among other things, their view of future prices, the volatility of prices and their appetite for risk, in addition to the absolute level of these prices.

Nevertheless on average the top-up price should equal or exceed the BNE price. This is especially so given that the market is newly liberalised and currently has capacity constraints, both of which factors indicate a requirement to encourage new competitors to enter the market. While it is undesirable to introduce artificial constraints into a competitive market, as ESB Power Generation controls practically all the generation that is active in the market, their bidding will be a key-determining factor in the prices. With this level of control it is necessary that the ESB Power Generation bids are regulated correctly. The existence of a correct capacity signal will also help provide the proper incentives.

### **ESB Bidding Behavior**

One respondent suggested the regulation of ESB's bids and the reward of capacity is critical to any pricing solution. Detailed analysis would be required to establish the exact price setting mechanism and the methodology for regulating ESB PG's bids. Nevertheless the principle that the current large differential between the top-up and

spill prices and the restrictions on access to electricity at these prices should all be removed remains valid. They serve primarily to erect barriers to entry and stifle competition. By moving to a more open market with closer prices a balance can be struck between supply and generation rather than the current large price differential that succeeds in impeding both.