ELECTRICITY INDUSTRY RESTRUCTURING INSTITUTIONAL ARRANGEMENTS AND ISSUES

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UDK 65.011.1
PROFESSIONAL PAPER

System Operators are often involved to a significant extent in forming input to the restructuring by governments of nationalised electricity industries. The final shape of the industry is, however, often dictated by issues that have little to do with system operation or technology, so it is important that system operators understand the economic and political considerations which lie behind the decisions and have some insight into the issues which arise. The objective of this paper is to outline some of the more important issues, rather than deal in depth with any single issue. It concentrates on issues arising in the Single Buyer model and in the case where some degree of Third Party Access (TPA) is permitted also, rather than on full TPA, because there appears to be limited debate about these first two cases. The paper is based largely on the author's involvement in the development within Ireland of models for migration to a fully competitive market over a number of years.

Key words: **Restructuring, Third Party Access, TPA, Single Buyer.**

BACKGROUND

Towards the end of the 1980's the EU decided that the electricity industry within its member states would be restructured along lines more similar to conventional free market industries. Most member states had some form of vertically integrated utility industry and initially there was considerable opposition to proposals which would terminate these models. In the early 1990's the Energy Commission seemed prepared to accpet models based on pure Single Buyer (i.e. no TPA) principles but later, due to increasing opposition, insisted on some initial measure of direct trading between producers and customers (i.e. TPA to networsk). The current view is that limitations on TPA within the EU will disappear some time in the next decade.

Many countries not currently in the EU, including eastern European countries, are now in the position in which the EU countries were 10 years ago and are looking at EU and other developments as a possible basis for restructuring their own industries. Some of these countries, for good reasons, may wish to proceed in a more gradual way, at least initialy. This requires careful consideration of what an initial industry model might be and what will be the rate and final degree of progression.

PROGRESSIVE STAGES OF MARKET LIBERALISATION

The term "deregulation" has often been applied to opening up of markets. However the experience has often been that an increasing degree of regulation is actually required, because in a previously noncompetitive environment the Government could effecitvely dictate developments. There are various stages to which liberalisation may be progressed. These are:

1. Single Buyer - Competition in Generation only
2. Single Buyer - Competition in Generation and Supply
3. Hybrid Model - Single Buyer *cum* Third Party Access (TPA)
4. Full TPA Model

The paper describes these models briefly and than discusses the issues that arise, from the government, public and customer perspective, concentrating on cases 1-3. The term 'utility' is used to describe one or more large public companies producing and supplying electricity and owning networks.

SINGLE BUYER - COMPETITION IN GENERATION ONLY

In this model the utility would not be the sole electricity producer but would be in cimpetition with independent producers (IPPs). In theory two forms of competition are possible, competition to win a term contract (i.e. a Power Purchase Agreement or PPA) or competition on an hourly basis. In practice only the first of these has been considered. The competition would be organised whenever there was a need for extra generation and in principle both the utility and IPPs would compete.

https://doi.org/10.37798/2001501625

From the public perspective such an approach has a number of weaknesses:

The utility will usually itself decide or will have a major input into the decision to hold a competition. It will also have a major influence on the type of plant and other constraints. Objections are that:

- The utility will overstate the requirement in order to have an opportunity to build more generation
- The utility will understate the case in order to block competition or to ensure the continuation of old plants in its ownership which should properly be closed down
- The utility will conduct the competition in an unfair manner, either in the bid evaluation or in setting the parameters and backgroung against which the bid is evaluated.

In some cases governments have required an independent planning unit as a guarantee against this bahaviour. In other cases they have suggested the removal of the Single Buyer function, as both planner and bulk electricity purchaser / seller, from the utility.

From the utility perspective competition in generation can, in theory, have a seriously damaging effects on profits, even where it is still the Single Buyer. The overall incomed of a utility derives from production, networks and supply (i.e. retail sales). Of these, supply forms only a few percent of revenue, so generation and transmission / distribution generate most of the income, often to an near equal extent. Generation is usually considered a somewhat higher risk investment, so regulators or governments tend to allow a higher rate of return on generation than on networks, and consequently the greater proportion of the utilities profits would come from generation. A significant reduction in the utilities market share of generation would reduce their profits substantially. For this reason some companies have expressed the view that the difference between operating to a Single Buyer model and full TPA is not so great as is presumed.

From the public perspective, however, in a pure Single Buyer environment the market is unlikely to open up other than at the slowest rate, as new plants will establish only as required by growth and old plants will survive for an excessive period of time. This was a major factor behind the EU decision to allow some degree of TPA.

From a government perspective a Single Buyer with competition in generation only has some advantages:

- The government still retains a good deal of control over the industry and implementation of energy policy easier
- Older generating assets, which are in public ownership, are protected for a longer period of time and not made prematurely redundant.

These may be compelling arguments in cases where a country would find the write-off of public assets damaging to its economy.

The major disadvantage from a government perspective is that there is excessive flexibility in the longterm PPAs held by the utility, thereby preventing the early entry of newer efficient generation technology. In at least one case within the EU the price of electricity remains amongst the highest in the EU because existing plants were privatised and put on 10 - 20 year PPAs.

Issues also arise with respect to the independence of the transmission system operator (TSO). Many believe that it is possible for the utility system operator to give preferential treatment to comapany generation, in a manner not immediately obvious, in areas such as enforcement of enalty conditions in contracts, organisation of generation and transmission maintenance and information regarding expected running requirements. For this reason there is often a requirement to remove the system operator from the utility and to establish an independent TSO.

COMPETETIN IN GENERATION AND IN SUPPLY

In this model it is possible, also, for certain classes of customers or bulk electricity purchasers to purchase electricity on a bulk tariff basis from the utility. In some countries where there are a number of distributors not connected with the national utility, this arrangement is already in place. The model would require that a Bulk Supply Tariff (BST) be generated by the single buyer function, for sale to the utility supply business and to independent suppliers or to certain large customers. The BST would be time-based and would probably contain separate capacity and energy components. All purchasers would pay the same price at any point in time.

Since the margin on the supply segment of utility business is generally very low, usually of the order of some percent, many consider that this model is not of any significance and not worth the effort.

HYBRID MODELS - SINGLE BUYER CUM TPA

In response to pressure exerted by some member states against a pure single buyer model, the Energy Commission introduced a concept of 'modified Single Buyer', where 'certain classes of customers could purchase energy from a single buyer *at the same price as it* (the S. B.) purchased from a producer. In effect it was allowing those customers to purchase directly from producers, paying a transmission charge to the utility either on a tariff or negotiated basis.

The modified Single Buyer is equivalent to two forms of market operating in parallel - a single buyer for customers not entitled to purchase directly and a TPA market for those so entitled. Several difficulties arise in respect of this parallelism:

- The distinction between customers entitled to purchase directly and those not entitled to do so is inevi-

tably arbitrary. It is possible for two directly competing industries, identical in every respect except in size, to pay different tariffs for electricity by virtue of the fact that one is excluded from directly contracting with a lower cost generator. There have been strongly expressed views that this is actually illegal in some member states, despite the provisions of the EU directive.

- The two markets must be allowed to interact with each other, or it will not be possible for an emerging TPA market to survive the initial years while it is developing into a self-sufficient market of survivable capacity. This would be a particular issue where interconnectivity with adjoining states was relatively low. The primary argument is that (TPA) customers dependent on individual (TPA) generators must have some capability to purchase also from an alterantive firm supply, probably the single buyer market segment, while its contracted generator is out of service or more usually where these is some imbalance between contracted and actual delivered electricity. The same applies to excess generation by generators in the TPA segment. Without these provisions the entry risk to the TPA segment will be perceived to be excessive by new independent generaors and the exit risk as excessive by departing customers. However it is difficult (but not impossible) to construct a system where the single buyer, which will be dominant in the earlier years, is not in a position to dictate to its advantage the price at which it trades with others.

For these reasons and others there appears to be a general consensus that such hybrid models are only regarded as a means of transition to a fully liberalised model.

Responsibility for security (adequacy) of supply. This can be a very difficult issue to resolve. Traditionally the utility has had sole responsibility for security of supply. However, when certain customers are allowed to choose a supplier other than the utility, to what extent does that utility continue to make provision for their security of supply? If it is required to make full provision on behalf of all customers, it will carry additional capacity on behalf of customers not contracted to it, and therefore the utility customers are perceived as subsidising the TPA customers. To reduce the burden on the utility it might be required to make provision only for those customers which it expects to keep. However this is an uncertainty and the utility would have to make an estimate based on an optimistic outcome (e.g. it keeps most customers), so it is still likely to have over-capacity to some extent. It seems that in practice there is no totally satisfactory solution to the problem of obligation to supply in a hybrid situation where the markets interact.

Stranded Assets. A dual model will lead to some degree of 'stranded assets', as before the introduction of TPA it will have purchased plants or entered into agreements on the basis that it would have continued to remain a Single Buyer. Had it been aware that a TPA market would evolve, it might have decided not to contract or construct certain plants and to deal with supply by some other means. It is now common, and it is allowed by the EU Direcitve, for stranded assets to be identiffied and a cost recovery mechanism agreed to allow their recovery over, say, 5 years from all customers in the market.

THE SINGLE BUYER FUNCTION AND THE TRANSMISSION SYSTEM OPERATOR

Some of the issues associated with these funcitons have already been mentioned. Others are discussed now.

Pure Single Buyer Environment

In a pure single buyer environment there will, as has been noted, a problem in the public perspecive about the independence of the single buyer function. The EU Directive requires that decisions regarding the tendering and selection of new production be separated from the parent utility. The issue of independence in planning has also been raised. There is the further issue that the single buyer function is precluded from contributing any financial benedit to the utility. It must be allowed to behave with independence, which means that the utility board of directors takes responsibility for its actions but is powerless to influence them. The utility is likely to conclude that the single buyer funciton is a liability and should be external to the company.

If this solution is adopted the functions removed would probably include planning for future production requirements, conducting the tendering procedure and purchasing selling bulk electrictiy from and to the utility. Given that the Single Buyer model is almost certainly predicated on contracts with producers in the form of term Power Purchase Agreements, the question of the suitability of this party to be a counter-party to such contracts arises. On its own it does not have a retail customer base nor does it have any assets. Therefore either it would require back-to-back supply contracts with the utility for a duration equivalent to the term of the PPAs which it holds or it would require a state backed quarantee.

Back-to-back constracts are theoretically realisable but the utility may be relucant to enter into such contracts. From its perspective it is still contracted to purchase electrity from a body (i.e. the extemal single buyer) which makes all its decisions independently, and therefore the risk exposure is little different than were the single buyer internal to the utility. State guarantees are most unlikely to be forthcoming.

In a Pure Single Buyer environment there might also be concern that the system operator, within the utility, might not operate on a fully objective basis but might

somehow favour plants in utiliy ownership. The structure of Power Purchase Agreements and strict oversight by a regulator might make this acceptable. In such a situation there would appear to be no strong arguments in favour of either removing from the utility the system operator or ownership of the transmission network. In one specific case, where it had been proposed that the Single Buyer would be removed from the utility, it was also proposed that the system operator would act as the Single Buyer's agent. This prposal did no go ahead.

Single Buyer cum TPA

In this situation it is evident that the System Operator has to operate on behalf of both the utility market and the TPA market. From the public perspetive the potential conflict of interest for a utility system operator is probably too great, and there is a compelling case for the removal from the utility of the System Operator. Conversely, the case for removing the Single Buyer function (now not a full Single Buyer) is much weakened and it could probably remain within the utility, perhaps even being subsumed into the utility Supply business.

There is a serious issue as to whether transmission network ownership should also be separated from the utility, either in a separate company or in the ownership of the (external) Transmission System Operator. The argument in favour of its removal is that the utility still retains substantial control over the network and can possible manipulate it to its own advantage, for example by the manner in which it schedules maintenance of lines adjacent to its own generating stations compared with IPP stations. If it is to remain within the utility, then in order to ensure that all users are treated equally, substantial oversight of its management is required by the external TSO and by the regulator. There is also the issue of planning and implementation of network extensions - it is conceivable that extensions deemed necessary by the TSO may not be carried out or delayed by the utility, where they are for the benefit of a competitor of the utility. The utility might resort to claims of excessive environmental opposition or other measures in support of its position. The burden on the regulator might prove to be quite high.

There is a further issue as to whether the network should be in the ownership of the TSO. Arguments against this are that the owner of an asset, in this case a monopoly asset, will have an incentive to increase this asset in order to increase its income and that planning will not be carried out objectively. In some cases the network had been put in ownership separate from the TSO (e.g. Victoria, Austraila). An argument against such separate ownership is that the co-ordination of construction and maintenance between different entities is difficult.

Finally, there is the question of which party will be responsible for conductiong the settlement of the trading between the independent parties and the utility. There is an argument that this responsibility should be assigned to the TSO as it is neutral. However arguments in support of a fully independent settlement system, not associated with the TSO, have been advanced. In the case of the England / Wales Pool, the TSO (i.e. the British National Grid Company) executes the pooling calculation on behalf of a separate Pool company. Some objections have been made to this arrangement but not sufficiently strong to have it altered.

CONCLUSION

There are many issues attaching to models where there is either a pure Single Buyer or a Single Buyer *cum* TPA. Of these the most important consideration is whether a state embarking on the dual model intends retaining that model for a long period or views it as a transition, only, to a full TPA model. There would appear to be strong reasoning in favour of adopting a pure single buyer model only if it will exist for a significant period, say 10 - 15 years or at least some period comparable to the duration of Power Purchase Agreements with independent generators. It would appear that if there is to be a dual model, it should be considered as existing only for a transition period, related to the time over which stranded assets will have financial recovery, say up to 5 years.

INSTITUCIONALNO OKRUŽJE I PITANJA RESTRUKTURIRANJA ELEKTROPRIVREDE

Vlade nacionaliziranih elektroprivreda često u značajnom opsegu uključuju operatere sustava u proces restrukturiranja. Međutim, konačni oblik elektroprivrede često je određen smjernicama koje nemaju puno zajedničko s radom i tehnologijom sustava, stoga je važno da operateri sustava razumiju gospodarska i politička razmatranja, koja leže iza odluka i steku uvid u neka od nastalih pitanja. Svrha je ovog rada istaknuti neka značajnija pitanja a ne pojedinačna detaljno obraditi. Rad je usredotočen na pitanja koja se pojavljuju u modelu "jedinog kupca" u slučaju kada je donekle dozvoljen i "pristup treće strane" (tzv. TPA), a ne jedino na potpuni TPA, jer se pokazalo da je rasprava ograničena na prva dva pitanja. Rad se velikim dijelom temelji na osobnom višegodišnjem bavljenju razvojem modela u Irskoj, koji trebaju dovesti do potpuno konkurentnog tržišta.

WESENTLICHE EIGENSCHAFTEN DER UMGESTALTUNG DER STROMVERSORGUNGSTÄTIGKEIT UND DEREN FOLGEN

Die Beteiligung der Betreiber im System an der Zusammenfassung der den Regierungen zuzustellenden Angaben bezüglich der Umgestaltung der Landesunternehmen der Stromversorgung ist oft sehr bedeutsam. Die endliche Form dieser Tätigkeit ist oft durch Umstände diktiert, die wenig gemeinsames mit der Verwaltung des Systems und seiner Technologie haben; deshalb ist wichtig daß die Be-

treiber hinter den Entschlüssen stehende ökonomische und politische Überlegungen kennen, sowie eine gewisse Einsicht in die daraus heranwachsende Folgen haben. Der Zweck dieses Artikels ist eher einige von den bedeutendsten solchen Folgen zu betonen, als jeder Folge gründlich nachzugehen. Der Artikel ist auf Folgen im Modell des Einzelkäufers gelenkt und für den Fall der beschränkten Zulassung der beteiligung dritter personen, anstatt der voll zugelassenen Beteiligung; es sieht nämlich so aus, als ob sich die Debatte auf die zwei Umstände beschränkt. Der Artikel stützt sich auf die langjährige Mitbeteiligung des Verfassers in der Entwicklung der Modelle in Irland, welche auf ein Bestreben zum voll bewerbungsfähigen Markt über mehrere Jahre gerichtet sind.

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Uredništvo primilo rukopis:
2000-11-21.