

# **MULTI MARKET MODEL FOR THE INTRODUCTION OF INDEPENDENT POWER PRODUCERS (IPP'S) AND PRIVATE SECTOR PARTICIPATION (PSP'S) IN THE ELECTRICITY SUPPLY INDUSTRY (ESI) IN SOUTH AFRICA**

**Author and Presenter: Dr Elsa du Toit, BSc, MBA, PhD, Director  
Electricity Supply, Department of Minerals and Energy**

## **INTRODUCTION**

Government recognises that significant opportunities and need exist to increase the efficiency of the Electricity Supply Industry (ESI). The principal objective of the restructuring agenda should be seen as improving efficiency in the industry and the economy as a whole. This is not primarily in relation to short-term efficiency related to operating costs (although gains here may be stimulated), but more to investment – improving the allocation of capital and increasing the efficiency of the use of capital received from capital markets.

The restructuring of the ESI is a complex process. International experience has shown that poor implementation and the establishment of inappropriate wholesale electricity markets and a lack of demand side participation can lead to failures in the supply of electricity. The Government has therefore directed that a managed liberalisation approach will be used for the ESI restructuring process that addresses some of the positive developments arising out of a competitive multi-market model and ensuring Eskom plays a role in the development of Africa. This will be done on a phased basis, with the programme designed to accommodate South Africa's unique circumstances and its timing in line with Government's policies for the sector.

This paper gives an overview of the multi market model and summarises the work done by a consortium appointed by government and guided by a Stakeholder Steering Committee namely the Multi Market Model Workgroup.

## **BACKGROUND**

The Department of Minerals and Energy in close cooperation with the Department of Public Enterprises and other relevant government departments and stakeholders have embarked on a study to develop the following 3 outputs:

- Phase 1: The design of a multi market model specifically for South Africa
- Phase 2: Investigation of the current facilities e.g. Eskom Power Pool to ascertain whether it would be a good basis to start off from.
- Phase 3: The detailed functional market description, transitional plan and governance arrangements for the proposed multi market model for the electricity supply industry in South Africa. (Note: This does not include the actual market code.)

### **Process**

The project commenced on 4 November 2002 and was successfully completed on 11 July 2003 after a number of stakeholder consultations.

After the completion of the project an independent international reviewer was appointed to review the work done by the consortium and this paper will also present the findings of that report.

The aim of the restructuring of the sector is to be:

- Encouraging competition within energy markets.
- Strengthening the ability of the National Electricity Regulator (NER) to regulate private players and a competitive market.
- Making energy prices as cost-reflective as possible.
- Unbundling Eskom's generation and transmission groups and in the long term Eskom restructured into separate generation and transmission and distribution companies.
- Providing open access to the transmission lines.

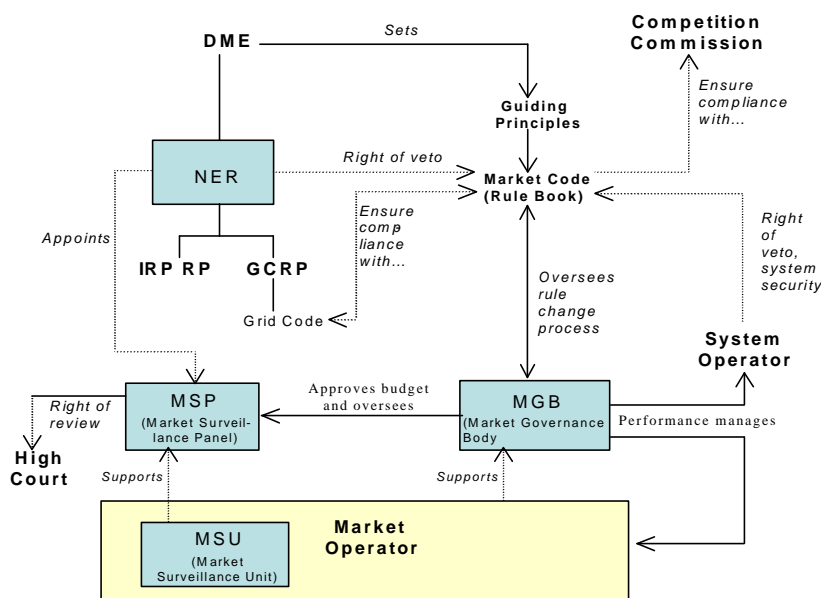
- ❑ Implementing integrated resource planning methodologies in evaluating further electricity supply investments and the decommissioning of older power stations.
- ❑ Further development of the Southern African Power Pool (SAPP).
- ❑ Increasing non-utility generation.
- ❑ Increasing transparency of subsidies, where required.

## GOVERNANCE FRAMEWORK

The multi market model will be a hybrid of private and public governance and will be governed by the following bodies:

- ❑ National Electricity Regulator – the regulator retains the responsibility to ensure that the market complies with Government policy. It must have appropriate tools to exercise this role over the electricity market, but also needs to be mindful when is the appropriate time to utilise these tools (as over-regulation of markets will compromise their effective operation and will impact on investor confidence). The NER plays key roles in both the monopolistic and competitive components of the multi market model.
- ❑ Market Governance Body (MGB) – this body has primary oversight for ensuring that the market rules remains relevant to the needs of market participants and stakeholders. A market must have the capacity to evolve to continue to meet the changing needs of its stakeholders and to take advantage of new technologies as they become available. The MGB also oversees the performance of the service providers (Market Operator and Systems Operator) and the market's surveillance regime.
- ❑ Market Surveillance Panel (MSP) – a panel of independent experts appointed by the NER and overseen by the MGB. This body acts as a quasi-judicial panel for the market (analogous to a panel of judges in a court system). The responsibility of the MSP is to ensure that where market participants do not comply with the market rules they are identified and appropriately disciplined.
- ❑ Market Surveillance Unit (MSU) – a team that sits as part of the Market Operator who provide support to the MSP. The MSU will implement surveillance processes outlined by the MSP, investigate alleged rule breaches within the market and prepare reports for the MSP to decide what further action is required. In the event that an alleged rule breach progresses to a formal MSP hearing then the MSU will act as prosecutor.

Figure 1: Governance bodies in relationships



The key governance issues faced by an electricity market can be broken down into four areas or processes as follows:

- ❑ **Admission and exit procedures** - making sure people can join and be bound by the rules
- ❑ **Rulemaking processes** – making sure the rules can evolve to meet changing needs of the market
- ❑ **Surveillance and compliance** – making sure people obey the rules and can resolve disputes; and
- ❑ **Administration** – of each of the above.

The consortium recommended that the MGB, the MSP and the service providers should be created as soon as possible during the implementation process, and certainly well in advance of the market opening. Naturally, the government and the NER has to maintain overall oversight and responsibility for market implementation and must make the decision on when it is prepared to let the market go live.

However, the existence of the MGB, the MSP and the two service providers will create focal points for accountability for key parts of the market build and implementation project. International experience suggests that these projects are fraught with risk. However, this risk could be mitigated by the creation and early establishment of these institutions.

An additional benefit of this is that it allows pre-market experience, learning and training to take place, making the transition to the competitive market substantially easier. For the service providers, it also allows them time to employ new people and upskill existing staff to be prepared for new roles.

## TRANSITIONAL MECHANISMS

In the transitional the following will have to be dealt with:

- ❑ **Stranded Assets:** There is a risk that introduction of competition and a market will undermine the viability of certain assets. In a similar way, certain existing contracts in the industry may be “stranded” in that their value under a new market environment will change. There are three topics under this area: **stranded generation assets** which could be dealt with by the following: low return on public assets, debt restructuring and allocation, asset clustering, vesting contracts or a stranded asset levy. **Existing fuel procurement contracts** which could be dealt with by the following: allocation of contracts to Eskom clusters as the loss of bargaining power should not be severe, security of supply and coal stockpiles are also addressed. Existing special pricing agreements – a set of bilateral contracts that would be honoured in the new trading arrangements. This could be administered by KSACS.
- ❑ **Stranded Benefits:** Market reform may also result in certain beneficial activities being curtailed or at least influenced by new market conditions. Broadly termed “stranded benefits”, this includes support for research and development, demand side management, environmental programmes, and low-income support programmes (e.g. free basic electricity).
- ❑ **Transitional price mechanisms:** Competitive markets bring new risks to participants, including new price and volume risks. Government will want to ensure that participants’ exposure to these new risks are phased in over time, thereby facilitating a transition from a market to a competitive environment. The use of vesting contracts is proposed as a means to manage risks during the transition.
- ❑ **Facilitating investment during the transition:** While competitive markets are expected to deliver an efficient level of investment in the long-term, there may be difficulties during a transition period when risks are high due to the nature of transition. During this period, Government may want to put in place special mechanisms to ensure that sufficient investment takes place.
- ❑ **Regulating the transition:** The regulator has a role to play in the market, and during the transition period it is important that the basis for this longer-term role is developed. There is a need for new network tariffs in a market, regulation of cross-

subsidy mechanisms, regulation of energy charges for captive customers, and regulatory involvement in long-term planning.

## **MULTI MARKET MODEL**

The multi market model allows participants the freedom to contract bilaterally, as well as to make use of various administered energy trading arrangements to meet their electricity needs. In addition, the trading arrangements will allow both demand side and intermediaries to become active participants in the market.

Under the multi market model, the following opportunities for transactions shall exist:

- ❑ Long Term Bilateral Trade – for physical contracts: over-the-counter or facilitated through dealers or brokers. This market is essential to allow participants to hedge their risks through physical contracts;
- ❑ Day Ahead Market – a coordinated power trade mechanism whereby participants can trade physical contracts on a daily basis prior to real-time. The market provides an avenue to trade power not contracted bilaterally at low transaction costs. It also provides a public and transparent price signal;
- ❑ Short term bilateral trades – opportunity for bilateral trading and adjustment of physical positions after the closure of the day ahead market will exist, subject to SO approval on the basis of maintaining reliability and security. This option will allow participants to adjust their positions after closure of the day ahead without being exposed to real-time prices. It also allows a portfolio of generators to optimise production within the portfolio;
- ❑ Balancing Mechanism – enables the SO to balance the system on a real-time basis. This market platform is required to provide a market based mechanism to balance supply and demand in real-time;
- ❑ Ancillary services markets – arrangements whereby the SO can produce ancillary services essential for system operation, security and reliability from market participants, making use of competitive mechanisms where possible; and
- ❑ Financial markets – arrangements whereby market participants can hedge risks through a variety of financial products. These may include both bilateral arrangements (e.g. contracts for differences) as well as trade in standardised products (e.g. futures and option contracts) offered through an exchange. Financial markets are necessary to provide participants with opportunities to hedge their market risks.

**Figure 2: Schematic representation of the multi market model**

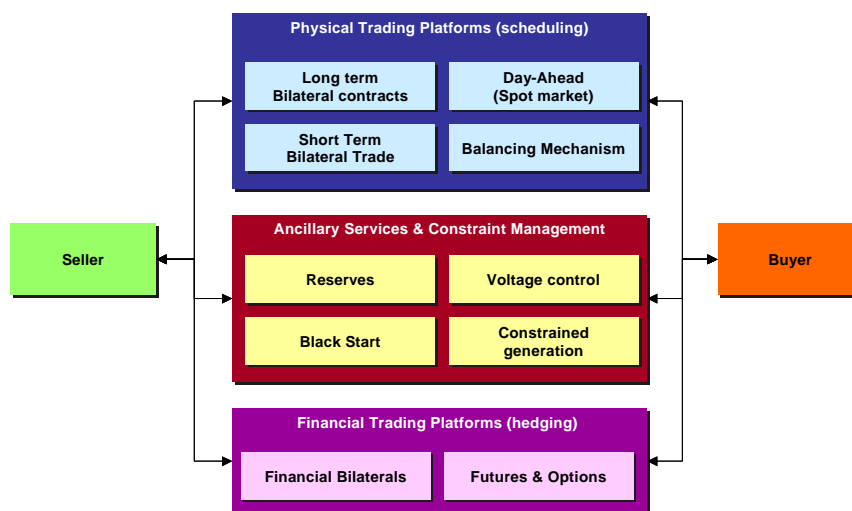
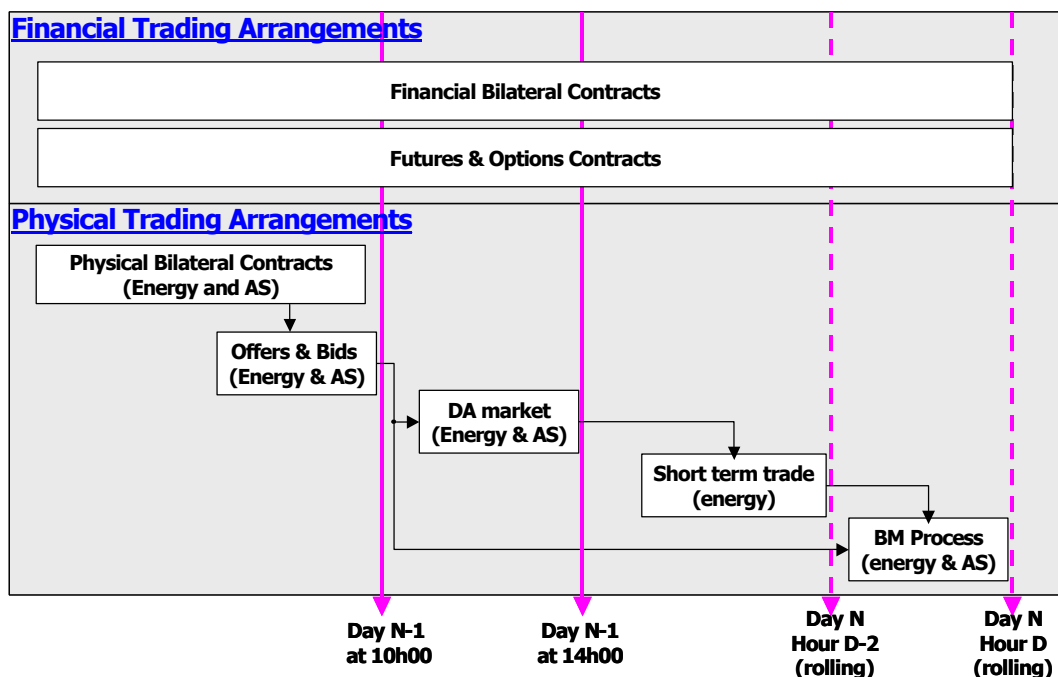


Figure 3: Timing and linkages of multi market model platforms



### SERVICE PROVIDERS

The MGB will appoint the Market Operator and System Operator as service providers to perform the necessary functions to operate a multi market. In addition the NER will issue licenses to both the MO and the SO to facilitate the market. Additional service providers (e.g. metering service providers) may be appointed to facilitate certain aspects of market operation.

### The role of the Market Operator

The MO is responsible to implement and adhere to the market rules. The MO's responsibilities will include amongst others the following:

- ❑ Receive offers and bids for the DA and BM
- ❑ Determine the unconstrained hourly production and consumption schedule for each participant for the following day;
- ❑ Calculate the DA electricity prices for each hour based on the unconstrained schedule (role as Pricing Manager);
- ❑ Publish a constrained hourly production and consumption schedule for the following day, based on constrained information provided by the SO;
- ❑ Hand over pre-dispatch information to SO and receive post dispatch information;
- ❑ Perform reconciliation activities (role as Reconciliation Manager), etc.

### The role of the System Operator

In addition to its traditional role (i.e. overseeing of system operations, security and reliability) the SO will be responsible for the amongst others the following:

- ❑ Perform various planning activities in short medium and long term. These include load forecasts, outage management, reserve requirements and network flows;
- ❑ Determine constraint requirements necessary to prepare the constraint schedule;
- ❑ Define, procure and call off ancillary services;
- ❑ Balance the system using valid BM bids and offers and AS contracts;
- ❑ Be responsible for buying and selling Inadvertent Energy Flow;
- ❑ Record all instructions to producers and consumers; etc.

## **Market Participants**

The design of the multi market model is premised on a competitive ESI structure being in place comprising multiple sellers, multiple buyers and service providers. The following organisations are assumed to participate in the market:

- Competing generating companies including Eskom generation clusters, IPP's as well as municipalities with own generation facilities;
- Distribution companies (distributors) comprising of Regional Electricity Distributors (REDs) municipalities and Eskom Distribution (at least during a transition stage to a future EDI structure)
- Retailers (including Brokers and Aggregators) trading on behalf of other entities
- SO purchasing and selling ancillary services, balancing energy (including inadvertent international energy flows) and the determination of losses to be purchased;
- Traders; and
- Between 100 and 150 contestable customers (users over 100GWh per annum consumption from a single metering point). Contestable customers could buy their electricity from a Distributor, a retailer, a generator, through participation in the DA or BM, or any combination of the various trading arrangement described.

A market participator must obtain a license from the NER, be registered with the MGB, and be certified by the MO and SO before he or she is allowed to trade in the multi market.

## **MARKET CODE**

From the detailed functional description of the market, the market code with the market rules for each of the participants in the market is currently being drafted and this will take place with regular stakeholder interaction to ensure that stakeholders are abreast of the developments and to ensure that the quality of the rule book is to the satisfaction of all players involved.

## **INDEPENDENT REVIEW**

The Department of Minerals and Energy appointed an independent international reviewer to review the market design in order for government to be more certain that the design for the multi market model is practical and feasible.

The overall opinion of the Reviewer is that the proposed design for the multi market model described in the consortium's reports, represents a firm basis for implementing a wholesale electricity market in South Africa. The proposals are generally considered to be effective and practical in the context of the South African market. However, there are a number of areas where the Reviewer has identified the need for additional clarity and a few areas where it is the Reviewer's opinion that a different alternative might be preferable. However, these reservations do not detract from the basic conclusion that the design is fundamentally soundly based. Furthermore, there is no reason why the planned implementation plan to investigate such details further and to provide the degree of clarity that will be necessary for practical purposes. Where the Reviewer has recommended that an alternative approach be considered, this again can be part of the implementation process.

The main area of concern is with the proposals for market governance, which are viewed as being unnecessarily complex. In particular, it is recommended that the need for a Market Surveillance Panel should be re-considered. A simpler rule change system may be required in the early development stages where it is expected that numerous changes will be needed, many of which could be non-contentious. It is also suggested that clarity is required in the mechanisms to prevent any one party from dominating the representation on the board of the Market Governance Body (MGB).

The proposal to adopt the existing Eskom Power Pool (EPP) as the basis for developing the market operations is supported thoroughly, as this has shown to be an effective mechanism to provide a day-ahead market. It is recommended however, that the planned enhancements should be incremental and reversible as far as possible in order to mitigate the risks of failure to achieve the required functionality within the expected time and costs. There is also a need for the existing entities in the EDI (i.e. municipalities, large customers, Eskom Distribution) to be involved in the development of the market at the earliest possible stage.



The overall design whilst not “proven” in the sense of having a previous track-record, is built upon a practical working mechanism. However, there are significant enhancements required, which will require careful planning. To mitigate the risks of cost escalation and failure, the implementation process should:

- Be carefully planned to a detailed process level;
- Be carried out in incremental, reversible stages; and
- Include suitable periods of system trials and shadow running with market participants.

The proposed use of a separate Market Operator (MO) and System Operator (SO), as apposed to a combined MO/SO, as used in many other markets, is constrained by the decision to retain ownership of the SO with Eskom transmission. This will require a very clear division of responsibilities between the two entities and suggests the need for separation of the EPP from the SO at the earliest opportunity, in order to establish the separate identity of the MO. This would also provide an opportunity for the EPP to be exposed to a wider participation.

It is agreed fully that some form of “vesting” contracts will be required as part of the transition process towards a competitive market. The structure, term, conditions and price levels of these contracts will affect the price trend of customers and, as such, is possibly the most important aspect of the transition mechanisms. It is therefore recommended that work on the proposals for the vesting contracts should begin as soon as possible. This should also include considerations of trading liquidity in the long-term bilateral markets.

Dealing in power purchase contracts is outside the existing experience of most Distributors and it is therefore recommended that there is a need to ensure that the municipalities develop the necessary capabilities with regard to trading. This is not something that can wait for the establishment of the Regional Electricity Distributors (REDs) as the trading capability will need to be established at an early stage.

Cross subsidies require a full analysis to understand the extent of the existing cross subsidies and how any unintended cross-subsidies (i.e. apart from subsidies specifically intended as part of government policy) may be phased out commensurate with the need to manage the price impact over the period of transition.

As noted in the report it is particularly important to ensure that new contracts for Special Pricing Agreements do not sell long-term at the current low prices when it is already known that capacity will have to be enhanced with higher-cost generation in order to meet demand.

It is likely that some degree of regulatory oversight will be required to ensure that the market prices are, as far as possible, least cost. However, this should not take the form of an intrusive regulation of offer and bid prices. Rather regulation should ensure that the correct incentives are provided to the regulated entities, consistent with the objective of achieving least cost.

The need for a regulated approach to ensure security of supply in the medium term, via a call for proposals, is fully supported. This will require oversight by DME /NER.

With regard to the legal and regulatory framework, it is suggested that an assurance process to continually check that draft legislation and license conditions and the MMM design proposals are in line, should be part of the implementation process.

The next step is to proceed with the implementation plan, under a suitable initial governance process. A Steering Committee, consisting of representatives from major stakeholders, would appear to be a suitable arrangement. There does not appear to be any reason for further analysis or review before proceeding with implementation.

## **CONCLUSION**

The implementation of the multi market model must be approved by Cabinet and then the implementation will commence with the establishment of the Market Governance Body. This

Body will then also further assist to ensure that the rest of the institutional structures are established and to drive the process forward.

At this stage it is not sure whether Cabinet will make such decisions before or after the election period.

## **References**

White Paper on Energy Policy for South Africa – Department of Minerals and Energy, December 1998

Draft Policy and Strategy for Electricity Supply Industry Reform for the Republic of South Africa, Version 5 – Department of Minerals and Energy, 2000

Final reports on Phase 3 of the work done for the Department of Minerals and Energy by the SAD-ELEC consortium, 20 June 2003

Final report of the Independent Review of the Multi Market Model study done for the Implementation Task Team of the Electricity Supply Industry Restructuring project, Ivan Adams, 28 July 2003