



Trans African Energy Pty Ltd

Energy and Infrastructure Advisory Services

Establishment of an Independent Market Operator

Governance and Administration of Centralised Wholesale Electricity Markets



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1 Introduction and framework for analysis

1.1 Introduction

There has been ongoing interest in setting up an Independent System and Market Operator (ISMO) in South Africa with draft legislation being developed from time to time. However, there does not seem to us to be a consensus view on the scope or role of the ISMO or consequential restructuring of the ESI that it might entail.

Nevertheless, the importance of the matter is such that it warrants discussion at a number of levels. The part of that discussion we would like to engage in pertains to the practical aspects of establishing such an entity.. In this regard, we wish to highlight that we have not aimed to undertake a normative study – that is – we do not mean to *recommend* which model should be applied. Our aim is simply to highlight key issues that would need to be addressed *should* South Africa decide to establish an ISMO.

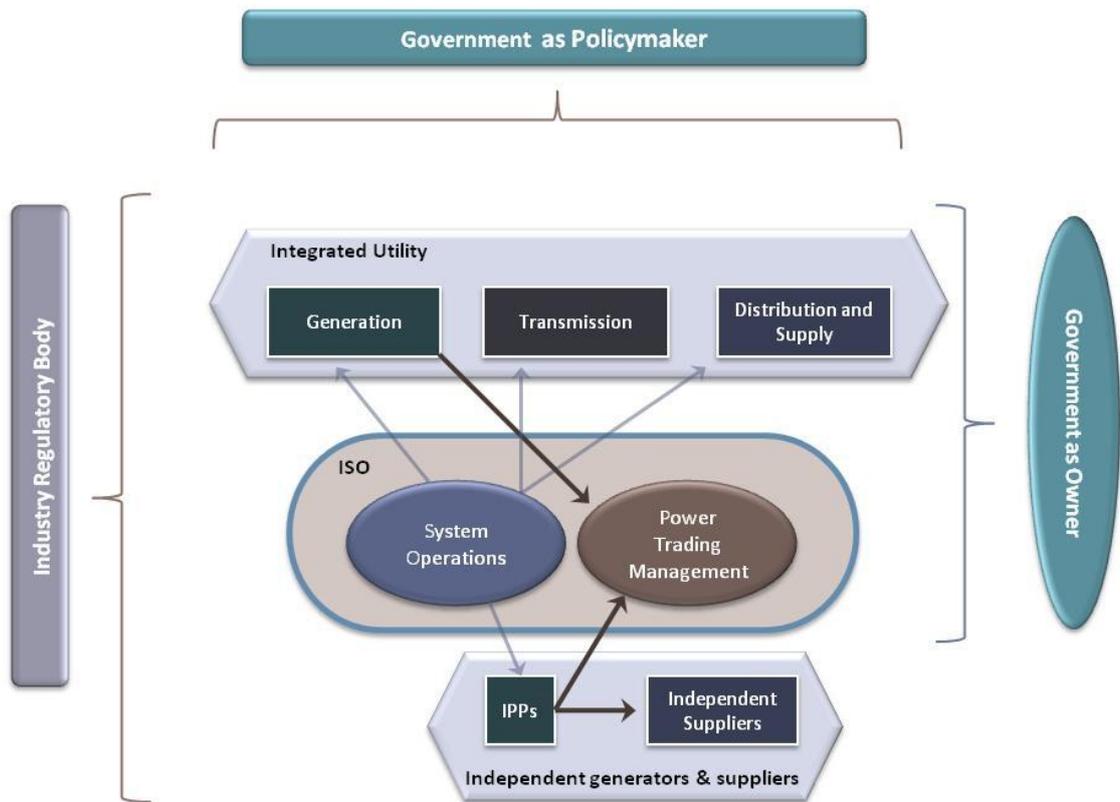
Pending further resolution and definition of ISMO we have assumed a minimalist view to industry restructuring.

- An ISMO is formed as a stand-alone entity – perhaps as a public enterprise or an entity of government.
- Wholesale power arrangements are established that might involve some combination of bilateral arrangements with the possibility of a central power purchasing authority.
- Generation and transmission are largely kept intact in a vertically integrated business.
- Restructuring of the distribution sector is not implemented during the short to medium term time frame considered here and not explicitly evaluated (nor retail competition).

It is assumed that new (or changed) roles in this market are defined through legislation and/or regulations and licensed with oversight by a regulator. We believe that our assumptions are reasonably robust to a range of modifications and revisions to these assumptions as the South African ISMO model is more fully defined. However, as our review is based on working assumptions – our analysis would need to be updated in line with new information as it is provided.

The following diagram illustrates the broad structure of the ISMO that is assumed in focusing our analysis.

Industry structure – working assumption only



1.2 Overview of ISMO roles

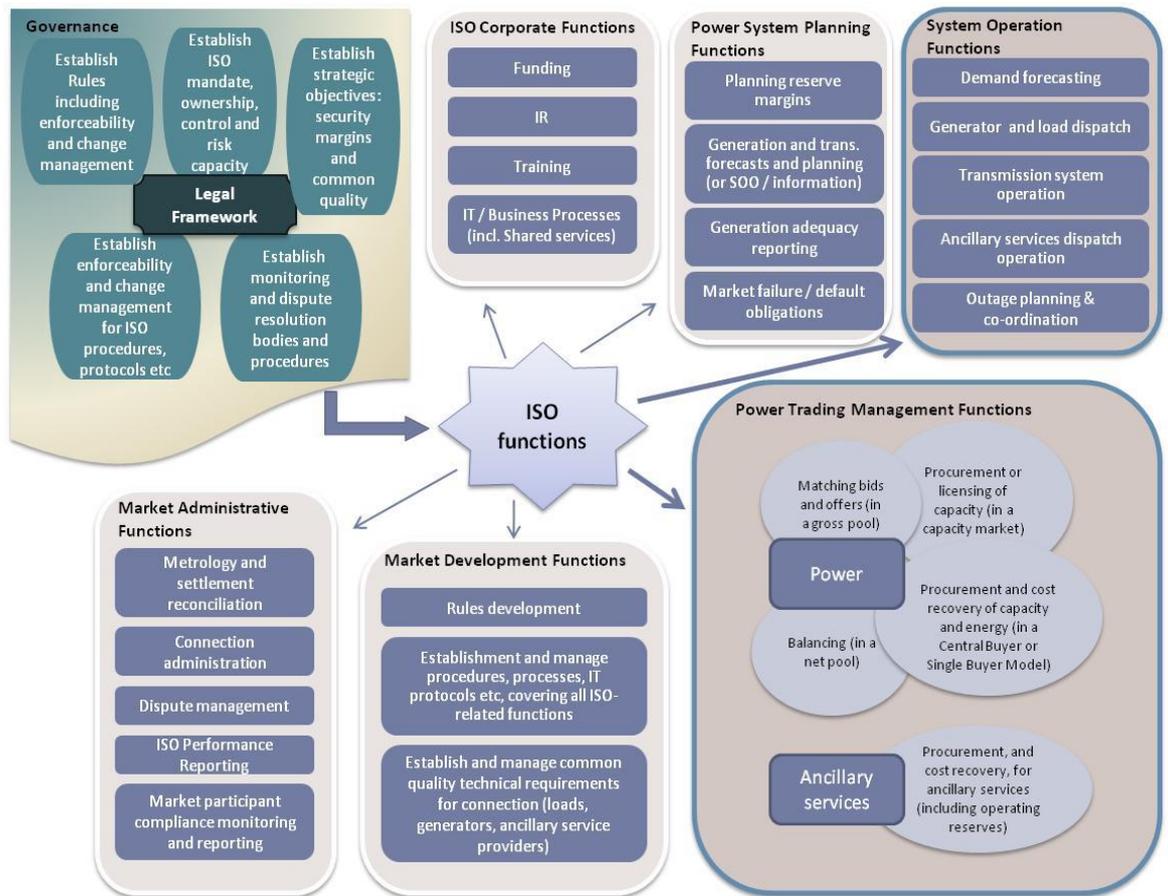
Under this structure there are two core roles that an ISMO tends to play¹.

- The first of these essentially defines an ISMO, in that the ISMO has the role of a **systems operations** manager, dispatching independent of the generation owners and operators. In some markets the ISMO is part of the transmission entity but, where it is not, the ISMO role needs to also encompass transmission system operation, including monitoring of power flows and constraints and (as required) issuing switching instructions.
- The second main role can be that of **power trading manager** or alternatively put an Independent Market Operator (the “IMO”) and this role varies considerably depending on the design of the wholesale power trading arrangements that are to apply. This may encompass a gross or net pool, or a central buyer concept. Further the trading arrangements may be structured based on energy only, for energy and capacity separately and may include arrangements for purchasing ancillary services. And this role may be combined in the same entity with the System Operator, or may be undertaken by a separate party.

¹ For convenience in this report we will use the term ISMO to include power trading operations (sometimes referred to as an IMO), except where the distinction is important

The indicative functions that an ISMO might potentially be asked to fulfil are illustrated in the following diagram. We stress that there is no single defined model for an ISMO and different markets tend to allocate different functions across different organisational models. However, we think the representation below offers a reasonably generic starting point for analysis.

Illustrative ISMO functions



There are several other groups of functions that are frequently placed in an ISMO as indicated in the exhibit above. These can be grouped as:

- Power system planning function
- Market² administrative functions, and
- Market development functions.

Power system planning and investment involves the role of establishing and/or monitoring planning reserve margins, and some role (whether

² In this report we will use the term “market” to cover the suite of arrangements under which power is purchased from more than one party and on-sold to more than one party. This includes the Central Buyer/Single Buyer model.

prescriptive or informational) in planning for new generation and new transmission.

Market administration functions often include matters such as wholesale metering and reconciliation, authorising new connections, dispute management, market monitoring and compliance reporting and performance reporting.

Market development functions include the establishment and ongoing management of rules, codes, procedures and protocols.

Finally there is a range of ISMO **corporate functions** including finance/funding, HR and IT.

Our review addresses each of these functions in turn with a focus on those that tend to have the most significant implications either for the new ISMO itself or for the generation/transmission/supply entity. The structure of the rest of this document is thus as set out below:

Section	Topic
Section 2	Governance and rule making
Section 3	System operations functions
Section 4	Power trading management
Section 5	Power system planning and investment
Section 6	Market administration and development
Section 7	Corporate functions
Annexure	International case studies

2 Governance and rule making

2.1 Overview of governance requirements

Governance arrangements need to be structured in a manner that clearly identifies parties responsible for achieving core objectives. Objectives relevant to the role of the ISMO include:

- System security and adequacy of supply objectives;
- infrastructure planning and investment objectives;
- system access objectives;
- common quality objectives; and
- power trading support related objectives.

In addition, there will be economic, environmental and other wider policy objectives that the ISMO will be required to take into account and comply with.

Generally, a government body will hold the responsibility for setting objectives through legislation, policy, regulation, and/or rules and an independent party (e.g. an ISMO or transmission company) will have the responsibility for ensuring delivery of the outcomes relevant to system operation and transmission. The requirements on other parties to follow and comply with instructions can be contained in a rules compliance regime including grid codes, connection codes, licencing conditions, market rules, etc.

2.1.1 Legal framework

The ISMO will have certain powers typically provided for under legislation and supporting regulations. This will include:

- **Establishing the ISMO** itself, including its articles of association, financial structure and ongoing funding sources.
- Powers which establish a set of **Market Rules** which govern the roles and actions of the ISMO and the roles and actions of participants in the market.
- Codified **change processes** for the Rules. This may be managed by the ISMO or by a separate body. For example, in Australia the AEMC manages Rule change processes and the market operator (AEMO) operate in accordance with the Rules (albeit with input to Rules change processes).
- Powers under the Rules for industry **policies, procedures and protocols** to be developed, typically administered by the ISMO but with input from market participants.

- There are various options for **enforcing the performance of an ISMO**. In some jurisdictions the System Operator is contracted to provide services and achieve outcomes. In other jurisdictions the objectives of the System Operator are set out in regulations and/or rules. Whichever approach is taken clear performance obligations and measures must be laid out. There are also typically certain legal responsibilities and indemnities provided to the ISMO that would need to be addressed in establishment of the new entity.
- A **dispute resolution** process. There is typically a range of complex and significant matters that the ISMO is responsible for, at some stage it is likely that a market participant will wish to call for review of a decision or action taken by the ISMO. For example, generation plants may need to be either 'constrained off' or constrained on' when system requirements dictate. While there would normally be definitive rules guiding the ISMO's actions in this example, it is conceivable that at some stage there will be a dispute on how the ISMO has applied relevant rules. The ISMO might be well placed to address disputes between market participants, however there needs to be an external body to which disputes with the ISMO itself can be escalated.

2.2 Governance within the context of the South African Grid Code

We note the South African Grid Code (Governance Code) in conjunction with relevant legislation describes the provisions necessary for the overall administration and review of the various aspects of the Grid Code and many of the issues briefly outlined above.

The current framework, which we have so far assumed would be employed as a template going forward, is summarised below.

2.2.1 Administrative authority

NERSA is the administrative authority for the Grid Code in terms of section 15 of the Electricity Regulations Act, 2006 (Act 4 of 2006). NERSA shall ensure that the Grid Code is implemented and complied with for the benefit of the industry.

2.2.2 The Grid Code AdvISMOry Committee (GCAC)

The GCAC (constituted by NERSA) is established to:

- Ensure a consultative stakeholder process is followed in the formulation and review of the Grid Code.
- Review and make recommendations regarding proposals to amend the Grid Code.
- Review and make recommendations regarding proposals for exemption to comply with the Grid Code.
- Facilitate the provision of expert technical advice to NERSA on matters related to the Grid Code.

2.2.3 Composition of the GCAC

Under the current Grid Code, NERSA is responsible for the composition of and constituencies represented by the GCAC to ensure that it is at all times reflective of the evolving industry. NERSA may decide to expand the composition of the GCAC as part of the membership review process in consultation with the GCAC.

The GCAC shall consist of at least the following:

- One member representing the System Operator
- One member representing transmission network service providers (TNSPs)
- Two members representing generators
- Two members representing distributors
- One member representing large end-use customers
- One NERSA member appointed i.t.o. the NERSA governance procedures
- One member representing black economic empowerment interests

2.2.4 Grid Code Secretariat

Currently, the System Operator is appointed as the Grid Code Secretariat. The secretariat plays an important role in that it is responsible for developing procedures for the review of proposed amendments and exemptions to the Code by the GCAC. Moreover (as summarised by us), the secretariat is to:

- Assist, when requested, in the preparation of submissions to the GCAC.
- Prepare amendment and exemption proposals for submission to the NERSA following review by the GCAC.
- Publish the Grid Code
- Inform participants of the progress with applications for amendment or exemption.
- Co-ordinate the activities of the GCAC.
- Function as a formal communication channel for the GCAC.

2.2.5 Rule change

The current Governance Code sets out the process for rule change which can have important implications for individual market participants and the industry more generally. Key aspects of the (current) process are summarised below to further highlight the potential importance of the GCAC and the secretariat in regard to rule changes:

- Once the GCAC has reviewed submissions in regard to proposed amendments and exemptions to the Grid Code, the *Secretariat* shall prepare the formal recommendation to *NERSA*.

- The chairperson of the *GCAC* and one member nominated by the *GCAC* shall attend the presentation to *NERSA*.
- An applicant may attend the *NESA* Board meeting if the *GCAC* does not unanimously recommend the proposal, and is entitled to make representations to the *NERSA* Board.
- *NERSA* shall give notice to the *Secretariat* of the decisions reached. The *Secretariat* is responsible for communicating these decisions to *participants*.
- The *Secretariat* shall update the *Grid Code* with the approved amendments and exemptions.

2.2.6 Complaints pertaining to the Secretariat, GCAC, or NERSA

In addition to setting out the process for resolution of disputes between parties, the Governance Code provides that any complaint regarding the operations of the Secretariat or the GCAC shall firstly be addressed in writing to the Secretariat. If the complaint is not resolved, the matter shall be referred to NERSA.

Any objection to decisions by the NERSA shall be made in writing to the NERSA. Participants may appeal to the High Court against decisions taken by the NERSA about which they are aggrieved.

2.3 Key issues in transition to an ISMO

While the current structure of governance set out in the SA Grid Code may well provide a strong basis for an ISMO, we anticipate some important dynamics moving forward³:

- The ISMO would often have a broader base of governance than for a public enterprise). There are examples internationally where the ISMO might be set up as a 'not-for-profit' organisation perhaps with joint government and industry representation at board level.
- It is our view that a range of matters set out in the Grid Code or related rules may be increasingly be taken to the GCAC, the Regulator, and perhaps to appeal as various market participants pursue their individual interests in Grid Code amendment and/or compliance.
- Incoming market participants are likely to call for changed representation on the GCAC (or similar body) so as to more strongly influence the working of that body.
- The ISMO would likely assume Grid Code Secretariat functions.

³ We wish to note that as a scoping document, we have not undertaken a comprehensive review as to the suitability of applying the existing set of Grid Codes to a new industry model.

- ISMO operational performance will be monitored and certain indemnities may need to be provided to the ISMO with regard to operational performance and liabilities.

3 System operations functions

3.1 System operations requirements

The ISMO is responsible for the safe and reliable operation of the power system. The South African Grid Code sets out operational aspects of this responsibility in regard to **power transfers** and stability of the Interconnected Power System (IPS).

An important aspect of this responsibility is in managing the power system in real time by **dispatching generation** to meet load requirements. The method of dispatch will vary according to the type of market. For example:

- in a *gross* power pool, dispatch of *all* generation is according to real-time market offers;
- in a *net* pool, generators each provide their dispatch schedules to the ISMO, which then issues dispatch instructions according the schedules and operates a net balancing market; and
- in a central buyer market the buyer is likely to provide dispatch schedules and the ISMO issues dispatch instructions according to those schedules and against criteria set out in Rules (i.e. dispatch rules).

In order to manage the power system, the ISMO is also likely to have responsibility for dispatching **ancillary services** such as frequency control, instantaneous reserve (including instantaneous load shedding) and voltage support in order to maintain common quality standards. As with generation load dispatch, there are a variety of mechanisms by which ancillary services may be dispatched.

The ISMO may also have the role of **Transmission System Operator (TSO)**; that is, the role of managing transmission system operations and switching. However this is not necessarily the case and the TSO role can be retained within the business of the transmission asset owner. In this case the transmission asset owner will be required to operate the transmission system according to agreed protocols.

Because of its central role, the ISMO would also typically have responsibility for managing, or at least co-ordinating, **planned transmission and generation outages**.

3.2 Key issues

The types of technical protocols and codes very briefly outlined above can have significant implications for individual market participants. While a comprehensive review of such matters is beyond the scope of our analysis, we do wish to illustrate the types of issues that might be subject to debate as existing protocols, market rules, and codes are further codified or revised. We do stress that this is more for illustrative purposes, as we have not had access

to the full set of existing rules pertaining to the South African IPS and we have not been briefed on the expected future state of such rules.

3.2.1 Power transfers - network access

An important structural consideration for the operation of an electricity market is the access arrangements for participants. The approach taken will have implications for an ISMO and market participants. The options can be considered to be 'open access' or 'managed connection'. In an open access arrangement all generators and loads are provided with rights to connect to the system but may be constrained by the real time capacity of the system. In an open access arrangement the ISMO will be required to manage dispatch of generation and/or load taking into consideration system constraints. Under a managed connection approach only generators and/or loads that can be guaranteed constraint free operation will be connected to the system.

The implicit or explicit network access rights that are assigned may well have a significant effect on the operations of generators and therefore could have significant financial impact on various market participants. There is a range of different models for access (from physically firm, to financially firm to non-firm) each with different implications when a generator is constrained on or off from the system.

- It is our understanding that under the South Africa Grid Code market rules set out the way in which parties are remunerated / charged for constrained on / off generation in the SA IPS.
- As the South African ESI becomes more segmented it is conceivable that the existing rules may need to be further codified to deal with constraints affecting various parties.

Market participants can have a great deal at stake in regard to the detailed nature of access rules, and we anticipate considerable attention to be focused on this matter going forward.

3.2.2 Ancillary services to achieve common quality objectives

It is important that certain common performance components are maintained within defined quality parameters. These common quality components include:

- frequency management;
- voltage management; and
- reserves management.

The above **ancillary services** are typically purchased from asset owners by the ISMO. It is our understanding that this is the case for the SA IPS currently.

Common quality objectives are set by a governing body and these provide the basis on which the ISMO manages ancillary services. The design of the common quality arrangements typically includes the following considerations:

- only aspects of quality that are truly common should be included (parties should be free to agree requirements for other aspects of quality bilaterally where feasible);
- common quality performance objectives for the System Operator should be specified at a high level to provide scope for innovation in planning and practice;
- market arrangements should be preferred to mandating technical requirements on asset owners. When technical performance requirements are mandated, these should be limited to minimising overall costs;
- how the System Operator sets out and communicates the means by which it intends to plan for and achieve the objectives and an assessment of ancillary services requirements including a plan for how the ancillary services will be provided and/or procured.; and
- how the costs of ancillary services will be met and recovered from the market.

The SA Grid Code might continue to provide the basis for these standards. However, as new participants enter the market, what might have been 'common' objectives may become segmented in line with individual interest of various parties. To the degree this occurs, we would anticipate far greater focus by market participants on rule change in the form of submissions to the GCAC.

3.2.3 Transmission system operation and implications for market participants

Where the ISMO is separate to the Transmission System Operator (TSO) the responsibility for provision of transmission network capacity and its availability is likely to be allocated to the TSO. At times of system constraints there may be a tension between the need to meet demand versus increasing loading on network assets. These types of tensions can materialize at times of planned outages on the transmission network when generation is also withdrawn from the market at short notice giving rise to supply and system constraints.

- In effect the TSO can become the 'supplier of last resort' in the sense that it might be expected to stand-down planned maintenance or run on temporary overload if generator outages occurred. Clarity is required regarding how these arrangements would be managed as it is possible that even for relatively small IPP generation facilities localised outages could (adversely) effect transmission operations.

An argument for maintaining a combined SO/TSO is that coordination can be improved between the system operation role and transmission asset management.

- Alternatively, if assuming the TSO and the dominant generator are in one entity it is conceivable that second-tier generators (i.e. IPPs) will consider this a potentially discriminatory arrangement to the degree that transmission outages might be managed so as to minimise the impact on the combined generation/transmission entity. In such cases the governance and dispute process pertaining to the ISMO and its role in coordination of outages will become increasingly important.

4 Power trading management

4.1 Power trading management requirements

Power trading arrangements include arrangements for purchasing and on-selling energy, capacity and ancillary services. The trading arrangements define the form of the ‘market’ and we use this term generally to cover all forms of arrangements for the purchase, sale or settlement of power or other services. For the purpose of this review, we have assumed that there will remain a combined ISMO/IMO that is responsible for certain aspects of market settlements at the wholesale level.⁴

Central buyer or wholesaler responsibilities present another component of trading arrangements and this may or may not involve the ISMO/IMO itself.⁵ Our working assumption is that the ISMO/IMO would also have some level of responsibility for purchase and sale of power. What we refer to generally as a “Central Buyer / IPP Administrator” would cover a spectrum of models perhaps ranging from a:

- **Single Buyer** – where literally applied provides a statutory monopoly on the purchase and sale of power.
- **Central Buyer** – that might have significant power procurement responsibilities but not a complete monopoly in regard to power purchase and on-sale.
- **Market aggregator or wholesaler** – e.g. providing balancing services to a competitive wholesale market, or aggregating bulk power supplies and costs in sale to suppliers.
- **IPP traders / administrators** - that are responsible for:
 - trading and administration of pre-existing (legacy) PPAs as an agent to the counterparty to the PPA, or in some cases with counterparty liability; and/or
 - responsibility for procurement of new power purchases, also with or without direct financial ownership of PPAs.

In addition to purchase of power, the ISMO needs to dispatch **ancillary services** which include frequency control, voltage support and instantaneous reserves (in the form of spinning generation reserves and/or instantaneous load shedding) and these services need to be purchased, and costs recovered. This may be through service level agreements with the incumbent generation/transmission entity, or through market based approaches that can include tenders for services and/or periodic auctions.

⁴ At one end of the spectrum may be a gross pool in which the IMO accepts bids and offers, dispatches (through the ISMO function) and settles (through the IMO function) on this basis. In a net pool the IMO acts to balance the energy market net of bilateral contract arrangements, dispatching generators to meet their (notified) obligations and dispatching balancing generation only based on dispatch rules. Such pools may be ‘energy only’ or they may involve separate capacity and energy trading arrangements.

⁵ While we have made the working assumption that buyer or wholesaler responsibilities would be placed into the South African ISMO, one can find counter-examples where these roles are held by separate entities.

4.2 Key issues

In setting out what we see as key issues going forward pertaining to the ISMO power trading responsibilities we wish to note that this matter is still to be determined. However, there are some broad issues we would like to highlight within the context of our preliminary scoping of issues.

4.2.1 Financial viability of the ISMO

- If the ISMO acts as Buyer it may have significant financial exposures as counterparty to power purchase agreements (PPAs) and on-sale arrangements. The Buyer will usually have significant capital at risk and will likely need to satisfy prudential requirements in the purchase and sale of power. In such cases substantive reserve accounts and probably some form of government guarantee may need to be provided for to fill this role.
- Alternatively, the more limited role of IPP trader – or perhaps only contract administrator is likely to carry significantly less financial risk and thereby require far less stringent prudential requirements and a vastly simplified system of governance and controls put into place commensurate with this risk profile.
- In any case, it is typical for the ISMO to procure Ancillary Services. As discussed elsewhere in this review, working capital needs for this component alone will be substantial and suitable prudential standards and guarantees of payment to AS providers may need to be put into place.

4.2.2 Incentives for efficient procurement of energy and ancillary services

With the significant financial risk exposure that such power trading functions might entail for the joint ISMO / Buyer, it is anticipated that a model would be implemented that places the most significant of these risks back with major market participants (e.g. through back-to-back vesting contracts if a wholesaler, or the ISMO taking a more minimalistic contract administrator type role).

At a very broad level of thinking this might entail a full pass through of costs for the ISMO (which is the typical model for a standalone ISMO). In this case ISMO incentives for efficient procurement of energy and ancillary services will become important.

- For energy purchases from IPPs, presumably competitive tendering processes will be applied and purchase price assessed against internal and external benchmarks.
- For ancillary services the market is likely to be rather centralized (perhaps within Eskom as the major provider or generation specific services for some time still). Over the medium term we would expect to see more decentralized supply of ancillary services.

5 Power system planning and investment

5.1 System adequacy and planning

System adequacy is vital to the success of an electricity market. Central to achieving this is the management of supply / demand margins and providing information on the level of investment in new infrastructure (generation and transmission) to meet forecast demand. The ISMO will typically maintain a significant level responsibility in this area due to the information base that it holds. It may involve the following functions:

- Establishing and/or administering the acceptable level of planning margin, based on analysis of forecast load and its variation;
- Playing a key role in developing long term load forecasts, monitoring generation and transmission developments and providing information to inform investors in new generation plants. This can take the form of reports on anticipated generation adequacy and reports such as a “Statement of Opportunities” (SOO) for generation development, transmission reinforcement or load development. The SOO would describe opportunities on a locational basis and also address interdependencies between projects.
- Develop and/or administer emergency and contingency planning with regard to system stability, forced outages, supply restoration, and disaster management. Similarly protocols for addressing financial impacts related to such use of emergency powers need to be in place so as to define and perhaps indemnify the ISMO from claims stemming from its administration of such powers.

There are a number of alternative approaches to the ISMO’s role with regard to system adequacy and planning that would go far beyond provision of information and protocols outlined above.

We note that within the context of South African ESI this is largely a matter for government to decide by way of legislation, and that many of these issues are addressed in the Grid Code. With this in mind we briefly summarise our understanding of the situation as it currently exists, and potential implications for establishment of the ISMO going forward.

5.2 The current situation for energy planning and investment

5.2.1 New generation planning and investment

Under South Africa legislation energy planning (or more specifically, Integrated Resource Planning) is administered by the System Operator, in consultation with the Department of Energy and NERSA – and subject to approval by the Minister.⁶ The planning role pertaining to the System Operator in developing the integrated resource plan includes:

⁶ Department Of Energy Electricity Regulation Act, Electricity Regulations On New Generation Capacity

- adoption of the planning assumptions;
- determination of the electricity load forecast;
- modelling and scenario planning based on the planning assumptions;
- determination of a base plan derived from a least cost generation investment requirement;
- risk adjustment of the base plan, which shall be based on:
 - the most probable scenarios; and
 - government policy objectives for a diverse generation mix, including renewable and alternative energies, demand side management and energy efficiency.

Having regard to the need for new generation capacity in the integrated resource plan, the system operator shall undertake a feasibility study to determine whether procurement of the generation capacity should be undertaken by Eskom as part of its services as the national electricity producer, another utility provider or an IPP. The matter is then to be considered by the Minister for Finance and Minister (for Energy).

If approved, the regulator may impose a licence condition on the buyer to buy all the new generation capacity procured by the system operator in accordance with the approved integrated resource plan.

5.2.2 Transmission planning and investment

The Grid Code requires the National Transmission Company (NTC) to annually publish a five year ahead Transmission System development plan indicating the major capital investments planned (but not yet necessarily approved). The plan is to include:

- the acquisition of servitudes for strategic purposes
- a list of planned investments including costs
- diagrams displaying the planned changes to the *TS*
- an indication of the impact on *customers* in terms of service quality and cost
- any other information as specified by the *NERSA* from time to time.

Before any development of the network proceeds, the *NTC* is to compile a detailed development investigation report. The *NTC* shall invest in the *transmission system* when the required development meets the technical and investment criteria specified in the Grid Code, or if the investment is in response to a *customer* request for *transmission* service and the cost is recoverable from the *customer* or group of *customers* concerned in accordance with the *NERSA* approved connection charges guidelines.

5.3 Key issues

It is often viewed that the primary role of the ISMO is clearly defined as real time coordination of supply and demand so that it is not seen as having responsibility for the availability of and investment in generation and transmission assets. This same view would place a responsibility of the ISMO to signal potential supply constraints and capacity shortfalls but the ISMO would not be held accountable for making assets available.

- In many markets there is a tension between the desire for central control and diversified market led decision making. It is important that the role of the ISMO (or any other body) is clear in this regard.
- If there is to be a strong central planning role, then this role must be clearly prescribed. However, if generation investment is to be market-led, then it is counter-productive to have a central party also being “held responsible” since this default role is likely to undermine commercial investment opportunities.

We further note that to the degree that transmission planning largely remains with the transmission operator, there will need to be a strong focus on coordination between generation and transmission planning process if they are administered per the existing Grid Code (i.e. generation planning administered by the SO, and transmission planning by the NTC).

A related issue for the ISMO is that in a more competitive environment it will be necessary to ensure that there are appropriate confidentiality provisions with regards to information provided to the ISMO, whilst still ensuring that the information (once aggregated) can be used by the ISMO to fulfil its planning and reporting role.

6 Market administration and development

As noted previously, we use the term 'market' to cover the suite of system administrative, operating arrangements and trading arrangements. While there is some overlap between these functions and what we have covered in previous sections, we wish to highlight in this section the ongoing evolution of such arrangements; the role of the ISMO; and to motivate implications for market participants.

6.1 Market administration functions

A range of market administrative functions may move to the ISMO. These include:

- Administering market metrology and providing wholesale energy reconciliation services;
- Administering aspects of connection and access to the system;
- Managing disputes that relate to ISMO functions;
- Reporting on ISMO performance (against the strategic objectives, such as common quality objectives);
- Compliance monitoring and compliance reporting with regard to other parties (for example reporting failure to follow dispatch instructions).
- Contingency plans (and perhaps market suspension) in the case of a default, or in the case of failure, of some aspect of the market trading arrangements.

Most of these functions are allocated to various segments of the interconnected power system under the current Grid Code, and we have made the working assumption that this would form the basis for the future structure of the ISMO – although we note that we have not been given guidance on this matter and our preliminary analysis is subject to change if this assumption proves to be wrong. We provide a brief overview of each matter below.

6.1.1 Metrology and reconciliation

The Metering Code specifies transmission tariff and energy trading metering requirements and clarifies responsibility in terms of metering installations. The Code is applicable to:

- main *metering installations* and check *metering installations* used for the measurement of active and reactive energy
- the collection of metering data
- the provision, installation and maintenance of metering equipment
- the accuracy of equipment used in the process of electricity metering
- testing procedures for *metering installations*
- storage requirements for metering data, and

- competencies and standards of performance of *participants*.

Broadly speaking, the NTC is responsible for administration and oversight of these matters.⁷ Metering data for use in energy trading and billing is confidential *information* and shall be treated in accordance with the *Information Exchange Code*, section 6. This will become of greater importance with the addition of IPPs so as to provide ensure that their metering information is not shared with utility generation.

6.1.2 Connection management

Connection may be managed in large part by the transmission and distribution network entities (applying transparent connection rules and processes). However the ISMO must have the ability to manage and dispatch generators and large loads (in its Power System Operations role) once connected, and therefore must have some role in authorising connection. In its Power Trading Management role, the ISMO may also have certain prudential requirements to be established before connection is authorised. Many if not all of these matters are likely covered in the Grid Code, but it is possible that additional attention will need to be given to the ring fence between transmission and generation so as to ensure non-discriminatory access to the interconnected power system by IPPs.

6.1.3 Dispute management

The Grid Code provides a process for dispute management and we anticipate this providing a strong basis for the new ISMO structure. Indeed, the ISMO should enhance the impartial process for administering disputes.

However, with the advent of new market participants we anticipate a range of formal complaints that the ISMO may either be best placed to consider; or in other cases may have taken actions that are the subject of a complaint by market participants

In light of the above, we would anticipate the need for additional codification of the areas in which the ISMO is to have responsibility vis-à-vis the regulator, and in particular, how commercial disputes are to be handled (e.g. the ISMO would not typically be seen as well placed to address disputes of a purely commercial nature).

6.1.4 ISMO performance reporting

The independence of the ISMO can also prove itself through the separation of strategic performance setting from market operations. In this regard it is important that clear performance targets are set under governance arrangements, and that the ISMO is established with the tools and processes to be able to accurately report against these targets.

We observe in some markets concerns expressed by some generators at certain decisions taken by the System Operator. It is vital that the ISMO is able to demonstrate its independence by having clear and transparent procedures and by being able to demonstrate that it has followed these

⁷ Please see the Metering Code for a formal description of responsibilities in this regard.

procedures (or to disclose where it has not). In this regard it is normal to have an ongoing ISMO procedures audit process in place.

6.1.5 Compliance monitoring and reporting

In many jurisdictions the system operator plays an important role in monitoring and reporting on market participants' performance and compliance with various protocols (such as the Grid Code). Under the current Grid Code, the System Operator has a number of responsibilities in regard to compliance monitoring and reporting – with ultimate responsibility for oversight with NERSA.

We would anticipate the ISMO to retain (and perhaps have added to) its responsibilities for compliance monitoring and reporting as this is a natural function for an independent entity with the type of expertise and information the ISMO would have. Again, the Grid Code sets out the broad governance process that would pertain to compliance based issues, but we would anticipate the need for further codification of the full scope and role of the ISMO in this regard as the market develops.

As an example of what we have in mind here, there are probably cases where the current 'internalised' structure of the industry has allowed for prudent use of rather more informal arrangements in regard to compliance based issues. Alternatively, establishment of an ISMO may lead to a more literal and proactive approach in compliance monitoring and reporting by that entity. This would likely have implications for areas that are currently perhaps not fully aligned to strict interpretation of compliance with conditions of licence and related codes and rules.

6.2 Market development functions

6.2.1 Rule changes

Some aspects of the market – such as legislative empowerment and Rules, will be outside of the ISMO and it will need to be ensured that a suitable arms-length body has responsibility for this (see under Governance). On the other hand it is important that the ISMO has input to any rules change or legislative change processes, primarily to ensure that the changes are workable and in line with defined overall objectives.

The current Grid Code sets out the process for rule change which can have important implications for individual market participants and the industry more generally. Our working assumption is that the ISMO will play a broadly similar role as compared to the current situation – including its role as Grid Code Secretariat and membership to the GCAC.

As we have noted elsewhere in this review, it is anticipated that a range of matters set out in the Grid Code or related rules will be increasingly be taken to the GCAC (i.e. submission for rule change). Moreover, establishment of an ISMO may lead it to take a more proactive role in regard to market development and associated rule changes that that may entail.

6.2.2 IT, business process and communications

Establishing the ISMO will externalise a lot of business processes that are currently internal to the incumbent utility. Depending whether the ISMO adopts new systems or contracts for use of legacy systems in the incumbent utility, there may be a need for new interfaces and new communications channels. In either case, other parties (such as IPPs and independent suppliers) will expect to be able to interface with the ISMO on the same terms as the incumbent utility. There will be an expectation that the ISMO will develop and publish a range of procedures, plus IT interface standards and communications protocols, for use by the industry.

This is a significant set of tasks. Some prioritisation is important: it is probably not necessary, and may be unnecessarily risky, to cut over all processes and systems simultaneously. However certain processes and systems will need to be available for ISMO start up and it is essential that they are appropriately tested before go-live. A clear transition plan is required. Input will be required from parties outside the ISMO and a steering group/working group structure is likely to be required. Following start up, these groups would likely continue to monitor the workability of processes and procedures and to progressively develop and adapt them.

7 ISMO Corporate functions

7.1 Corporate functional requirements

Establishment of an ISMO will require that the complete range of corporate support in administration, operation and governance of the entity is put into place. This is a substantive matter in its own right, and a complete scoping of this important issue would probably be better undertaken once government policy on the ISMO (i.e. the ISMO model) is fully set forward.

However, three broad areas of corporate functions we would like to highlight at this preliminary stage of work - and unique to transition from the current state to an ISMO are:

- Budget, funding of costs, and revenue source
- Corporate operational requirements
- HR

We provide some initial comments on these matters below.

7.2 Budget and revenue source

7.2.1 Budget

A sufficient budget and funding mechanism will need to be put into place to establish the ISMO and to maintain on an ongoing basis its operational and financial viability.

Fixed assets - We assume that where feasible fixed assets would be transferred to the ISMO with arrangements for remuneration to be decided. Depending on the commercial structure of the ISMO (e.g. not-for-profit) an establishment budget would typically be provided for once-off costs. These 'establishment fees' might be ring fenced from a regulatory accounting perspective and charges allocated to market participants accordingly.

Operating expenses - Core system operating expenses are manpower; IT and systems; and energy services (e.g. ancillary services). There will be both establishment and ongoing costs related to people, IT and systems that are fundamental to the operation of the ISMO. We discuss some related issues pertaining to *transfer* of people and systems in sections below.

Purchase of ancillary services - Energy services represents a significant financial exposure to the ISMO. For a stand-alone entity it will represent a significant need for working capital. Moreover, ISMOs are often 'not-for-profit' entities, and as such, have no retained earnings to draw from or fixed assets (i.e. balance sheet) in which to borrow against.

Wholesale trading functions – If wholesale and/or buyer responsibilities are placed with the ISMO it will require a significantly greater level of financing and control of associated risks.

As an illustration of what we have in mind, as a wholesaler in power purchases and sales the ISMO will have to be provided working capital sufficient to cover variability between power purchases and sales taking account of daily, weekly, monthly and annual variability, as well as counterparty risk of delay or default on payments. Similarly, power suppliers would likely need counterparty guarantees and/or explicit government guarantees for power that might be sold to the wholesaler.

Depending on the extent of energy services that the ISMO is responsible for, prudential requirements will need to be established, and a funding structure for the ISMO established in order to meet such requirements. This is a considerable issue in its own right, and we would advise thorough consideration is given to this matter as the intended wholesale trading / buyer model becomes further defined.

7.2.2 Funding and revenue source

ISMO costs are typically drawn from market participants reflecting the nature of the services provided by the ISMO and often on a 'causer pays' basis (to the degree cost causality can be established). Depending on the form of ownership and governance, fees might be decided by market participants; or regulated under similar governance processes as for the transmission network charges. Our working assumption at this stage is that ISMO fees would be regulated by NERSA. However, there are unique aspects to consider in design of regulatory approaches for revenue allowances for an unbundled ISMO in that:

- Standard regulatory approaches often applied to asset intensive network businesses (i.e. utilising rather fixed revenue allowances) are not ideally applied to an ISMO. A stand alone ISMO does not typically have a large fixed asset base (i.e. RAB). Following from this point, the balance sheet of an ISMO might not be substantial, although its financial risk will often be considerable. As discussed in section 5 of this review, a reserve account, frequent periodic adjustments, and other such features might be needed to address working capital and prudential requirements. This would become considerably more important if wholesaler / buyer responsibilities are rolled into the ISMO.
- If the cost of ancillary services is attached to the ISMO (which is often the case) a large proportion of total costs will be driven by external and potentially volatile costs necessitating a more direct recovery of actual costs of operations than might be found in a combined system operator / transmission business.

We have provided examples of how funding and revenue sources are accounted for in other jurisdictions in the Annexure (sections 9.1; 9.2; and 9.5) to this review.

7.3 Corporate operational requirements

As noted above, establishment of an ISMO will require that the complete range of corporate support would need to be provided for. For the purpose of this

initial scoping of issues we would highlight several key aspects of corporate operations that will need to be considered in establishment of the ISMO:

- Financial reporting and controls
- Transfer of IT/systems licences
- Service level agreements and transfer pricing

7.3.1 Financial reporting, data systems, and controls

The operations of an ISMO will be determined by the structure and complexity of the market in which it operates. Complex open access markets with security constrained economic dispatch (such as PJM, New England and New Zealand) require sophisticated financial reporting and controls to provide real time settlements and data for numerous market participants. However, managed connection arrangements with a central buyer approach, place a lower level of real-time management requirements on the ISMO.

- Whatever market structure is adopted, reliable and secure data communications systems between participants (generators and loads) and the ISMO are of paramount importance for maintaining the integrity of system performance and financial settlement.

7.3.2 Transfer of IT/systems licenses

Operational tools that are used by system operators include systems such as:

- Demand forecasting systems
- Scheduling and dispatch systems
- Communications management systems (for dispatch control, generator response etc.)
- Reserves management systems
- Market pricing systems (in power pools where dispatch is based on offers)
- Commercial arrangements may need to be made for transfer of existing licences to a new entity. At this stage we do not see any unsurmountable problems in this regard, but do caution that such transfers can in some cases be costly depending on the nature of existing contracts and resources needed to transferred.

7.3.3 Service level agreements and transfer pricing

There are a number of significant service level agreements and transfer pricing arrangements that would need to be either transferred or codified in moving from legacy agreements to the ISMO.

- **Ancillary services** - On establishment of an ISMO (and assuming that the ISMO is responsible for procurement of ancillary services) all transfer pricing arrangements will need to be undertaken within standard commercial arrangements. Moreover, it is likely that relevant process and contracts would need to be provided to market

participants, and as independent sources of ancillary services enter the market, additional competitive processes may need to be employed in procurement of these services.

- **Energy payments and charges** – To the degree that the ISMO is a financial intermediary between generators and off-takers, complete contracts will need to be established between parties. There is a range of approaches that can be taken, such as a relatively simple bulk pricing arrangement, through to real time cost reflective pricing. However, even for the relatively simple bulk pricing arrangements quantity risk (e.g. MWhs bought and sold) might be substantive and the ISMO would need to be provided with some form of hedge arrangement for both prices and quantities.

As an example of the type of arrangements that might be considered, one option is to arrange vesting contracts to apply from the outset between generators and off-takers. As for example applied in Western Australia, contracts could start as being for “all requirements”; in other words passing demand risk back to the generator. The vesting contracts would then wind back over a period of time and are replaced by negotiated contracts, which may have a different risk profile.

While the broad principles of the arrangements outlines above might not necessarily change significantly in establishment of an ISMO, there would be considerable work ahead in fully codifying them – particularly having in mind that change of agreements in the future would be between commercially separate parties. In our experience development of such contracts in restructuring can prove to be very difficult, and we are aware of situations in other jurisdictions where significant transactions of the type noted above have been undertaken between separate parties without contracts for a considerable period of time – certainly not an ideal situation.

7.4 HR issues

We anticipate that there will be new HR issues arising from establishment of an ISMO. Two key aspects of this are set out below:

7.4.1 HR

To the degree that the ISMO is set up as an entity fully separate from Eskom Holdings (e.g. perhaps as a public enterprise or other government entity) we would anticipate transfer of personnel to the new entity.

- Thorough consideration will need to be given on how to best retain the skill base needed for the specialised activity of the ISMO, and transfer of employee entitlements that might be applied to ensure a seamless transfer of staff.
- The specific corporate structure under which the ISMO is established will in many cases dictate the range of terms and conditions of employment that may be provided to personnel. For example, a public enterprise or similar entity established under the PFMA might have

relatively greater flexibility in regard to certain conditions of employment than as compared to an office embedded within department of government.

Both of these related matters will be crucial in the establishment of the ISMO so as to retain the skill base needed in delivery of this crucial part of the electricity supply chain.

7.4.2 Skills development

The final model chosen for the ISMO will also have implications pertaining to skills development and retention.

- For the more traditional aspects of the SO, retention of existing skills might be the primary focus.
- However, to the degree that the ISMO is given substantive power wholesaling/trading responsibilities – new skills may have to be developed and two rather different skill bases will need to be retained in the ISMO going forward.

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