

Market Operations in the Nigerian Electricity Industry: Going into the Transition Stage

By

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Presentation Agenda

- What is Market Operations & Who is the Market Operator?
- Development of the Nigerian Electricity Market
- The pre-transition market operations
- Operationalisation of the Rules for the Transition Market - going into the Transition Market

I

Defining Market Operations & describing the Market Operator

Market Operations - Definition

- The wholesale purchase and sale of electricity between the Generators and the Distributors, including the Eligible Customers, at the transmission and sub-transmission voltage levels
- Includes the sale of Ancillary Services (Reactive Power generation, Spinning Reserve, Must-Run generation, Black Start services, etc) for maintenance of grid stability and power quality
- Involved are management of the metering system (including the metered Data), settlements, payments and commercial reconciliations in the Wholesale Electricity Market

The Market Operator (MO)

The Central Coordinator of the
Wholesale Electricity Market

Roles of the Market Operator

- **Implement and administer the Market Rules, and draft and implement the Market Procedures**
- Review the efficiency and adequacy of the Market Rules and propose amendments
- Admit and register Participants, and maintain the information in a Participants Register
- **Train market participants on the MR, Market Procedures and Trading Arrangement for the NESI**

Roles of the MO (cont'd)

- Centralise commercial and contract information for settlement administration, and maintain Contract Register;
- Commercial administration of ancillary services and must run generation procured or allocated by the System Operator
- Administration and verification of the Commercial Metering System; in particular, verification that each trading point has adequate metering systems

Roles of the MO (cont'd)

- Administration of the settlement process, including transmission charges, and charges for system operations and market administration
- Administration of the Payment System and commercial arrangement of the energy market, including Ancillary Services and transmission charges

Roles of the MO (cont'd)

- **Preparation of the Generation Adequacy Report, from the SO's Load Projection Report**
- **Preparation of regular market reports (monthly, quarterly and annually) for the Regulator, and stakeholder information**
- **As the energy Market develops, the Market Rules expand or get modified, so do the roles of the Market Operator**

The MO Set UP - Departments

- Technical Data Administration
- Settlement & Commercial Reconciliation
- Treasury
- Market Development & Business Analysis
- Audit
- Information Technology

The MO's Mission Statement

To be an Efficient Administrator of the Market Rules ,in a manner that assures credibility and promotes Competition and stability in the Nigerian Electricity Market.

MO values

- **Independence**
- **Transparency**
- **Reliability**
- **Efficiency**
- **Accountability**

The MO Brand



**OPERATOR OF THE
NIGERIAN ELECTRICITY MARKET**

MO's TOOL BOX

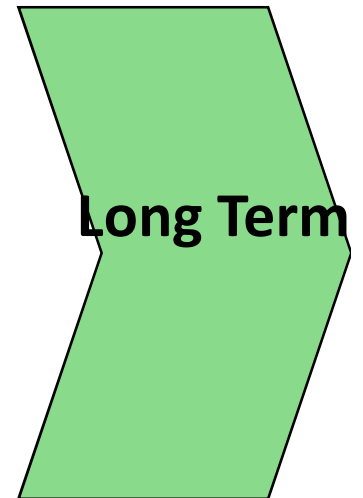
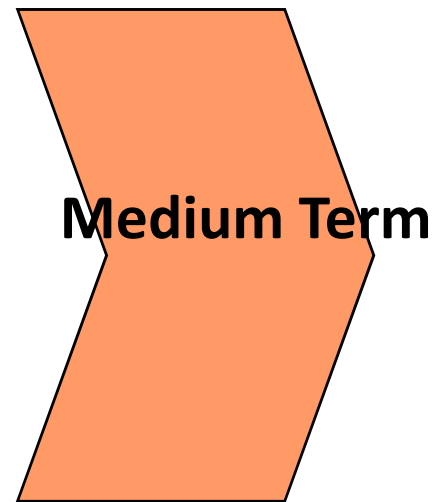
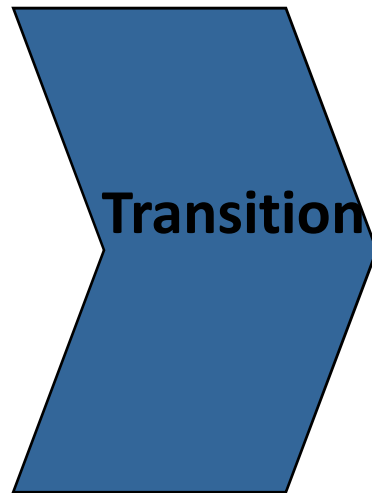
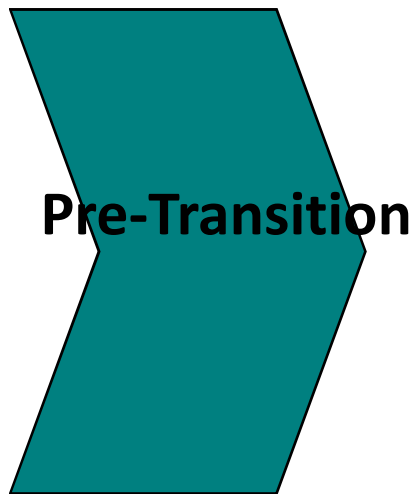


THE MARKET RULES

II

Development of the Nigerian Electricity Market

Market Stages



Market Stages (cont'd)

- Stages are differentiated by
 - How much monopoly is retained
 - How much competition is introduced.
 - The level and scope of trading activities in the Market
- During all the stages, Transmission, Distribution and System Operations retain their monopoly and regulated status
- Trading Arrangement gets more and more complex as the Market develops from the pre-transition stage to the long-term stage.

Characteristics: Pre-transition Stage

- Vertically integrated monopoly
- Full Govt. ownership
- Centralized authority and Budget
- All functions substantially bundled and regulated
- Huge supply gap
- Limited IPPs selling with PPAs
- Transmission access not priced
- Inequitable assignment of risks (eg energy losses)
- Low collection efficiency, low revenue
- **A stage for the preparatory work to initiate the Transition Market.**

Characteristics: Transition stage

- Insufficient generation, inadequate T&D networks
- Industry unbundled into constituent trading functions
- Trading among unbundled entities through contracts (vesting & bilateral)
- No competition in generation, but in the procurement of IPPs
- No consumer choices
- Open access of transmission network to Gencos and Discos
- Pricing of transmission access
- Efficient assignment of risks
- Implementation of strategies to increase efficiencies at the retail market side
- **Generous encouragement of generation entry into the Electricity Market**

Characteristics: Medium Term stage

- Sufficient generation, and robust T&D networks
- Competition in generation, and choices for Discos & large consumers
- Discos maintain monopoly over small end-consumers
- Open access of transmission network to both Gencos , Discos and large power consumers
- Pricing of the transmission access
- Trading mainly through Bilateral contracts
- Operationalization of the Balancing Market

Characteristics: Long Term stage

- Retail competition
 - All consumers, big & small, choose their suppliers
- Distribution (delivery) is different from retail activity
- Open access to transmission and distribution networks
- Pricing of transmission and distribution access
- Full-scale implementation of the Balancing Mechanism

Where are we now ?

- Getting to the end of the Pre-transition Market, and
- About to enter the Transition Market
- Entry into the Transition Market will happen in two stages
 - Go live stage - a practical and programmed transition from Pre-transition to the Transition Market (TM) stage
 - Go active stage - implementation day, initiation of the TM with the major CPs achieved



The Pre-Transition Market Operations

Objectives of the Pre-transition Market Operations

- To create awareness on Power Trading, and the Rules
- To promote independence and commercial operations among the successor companies
- To promote energy accountability and payment culture among distribution companies
- To increase Disco efficiency and revenue collection
- To increase generation reliability
- To move the new Successor Companies towards sustainability
- To prepare the Market for the Transition stage

Key activities during the Pre-transition Market

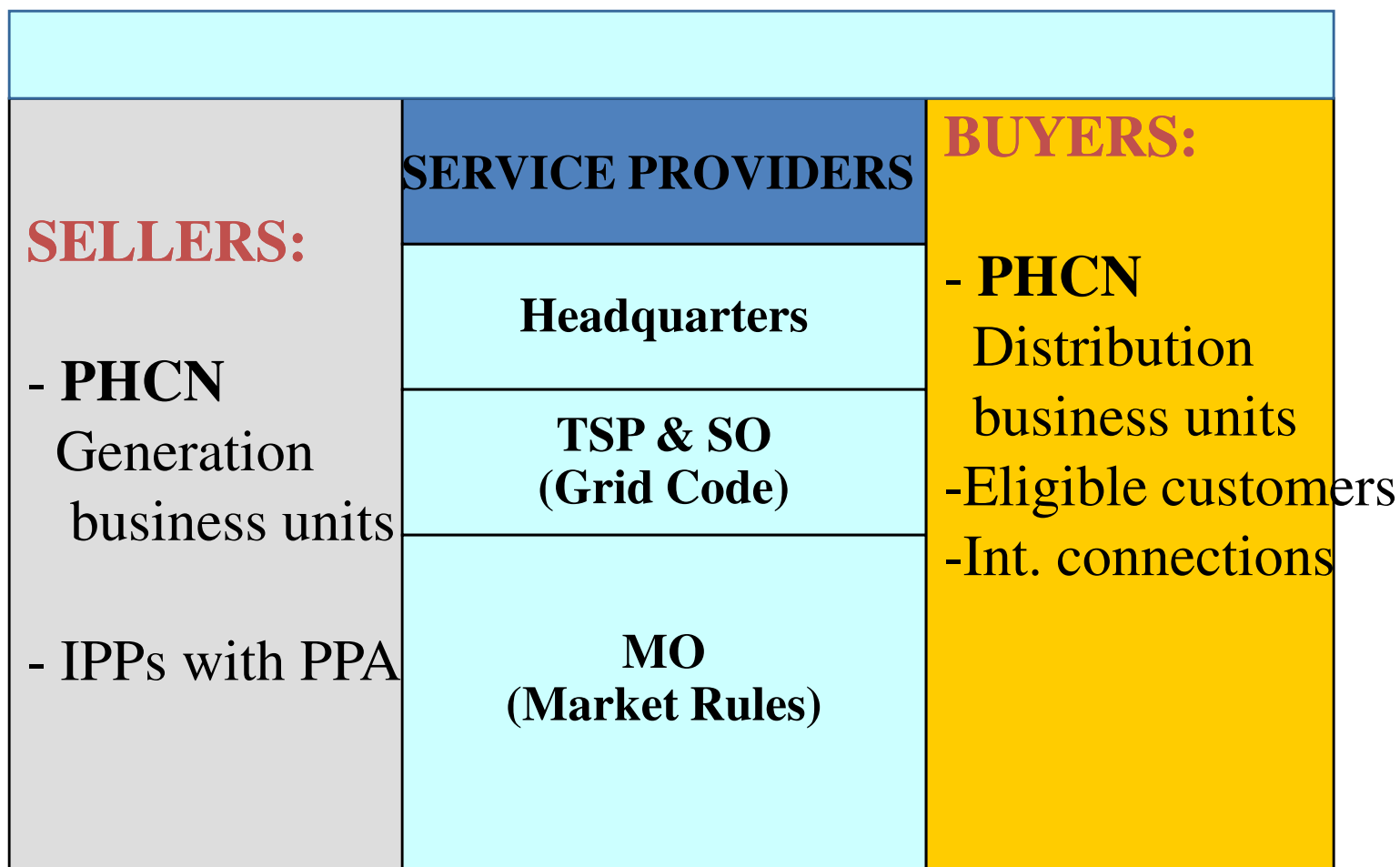
- Industry unbundling
- Identification and Metering of the trading points
- Development of Market Rules and Grid Code
- Setting up of necessary sector institutions
- Proper electricity pricing
- Shadow Market Operations, and
- General preparatory works to initiate the Transition Market

Industry Unbundling

- **Achieved**
 - Components of the industry functionally separated
 - Accounting records separated
 - Entities legally independent, but still common ownership
 - Operational unbundling – separate investment decision making process
- **Outstanding**
 - Ownership separation
 - Stronger form of separation
 - More difficult to implement
 - Involves some legal difficulties
 - Strong opposition from the workforce
 - Substantial set-up costs

The Pre-Transition Market:- Structure

(Post unbundling)



The Pre-transition Market:- Participants

- Sellers: Generators , including the IPPs, sell to the Distributors
 - Gencos sell with transfer prices
 - IPPs sell with PPA prices
- Buyers: Distributors, including the local large power consumers and international connections
 - Discos buy at various transfer prices, calculated every three months
 - Local large power consumers buy at the regulated end-user tariffs
 - International connections buy at the prices in the connection Agreements

The Pre-transition Market: Service Providers

- Market Operator
 - Commercial administration of the Market, including settlements and payments, using the MR
- System Operator
 - Technical administration of the energy Market using the Grid Code
 - Provides ancillary services for grid stability and power quality
- TSP
 - Provision of transmission access to both the generators and the distributors
 - Recognises transmission losses
- Others
 - Headquarters:
 - Provides common services, funding of special projects, payment for fuel, VAT etc
 - Enforces standards and compliance (in the absence of the Commission)

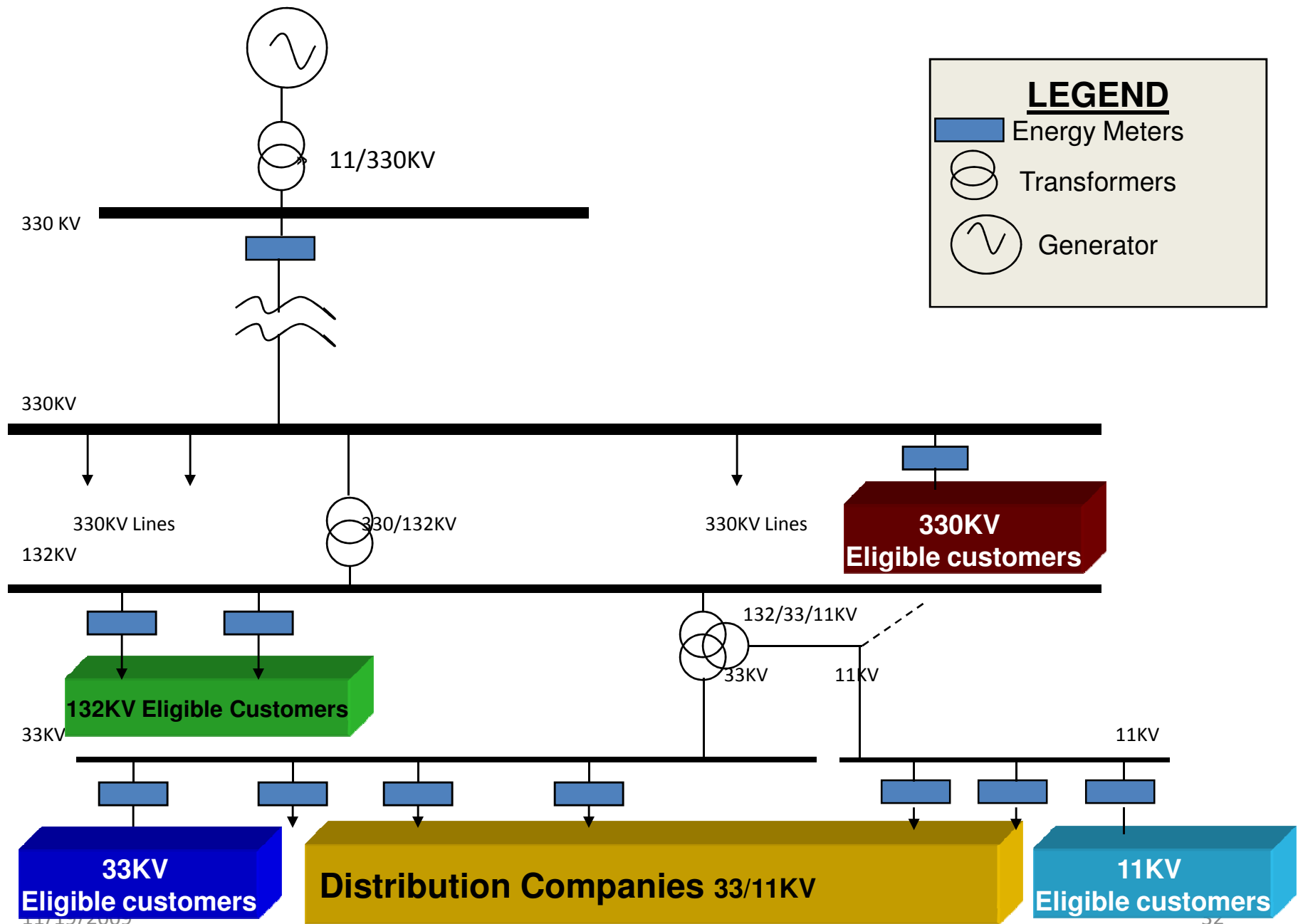
MO's specific activities in the Pre-Transitional Market

- Review of the Market Rules and development of Market procedure
- Identification and metering of the trading points
- Development of transfer prices
- Shadow Trading -Administration of metering, settlement and payment systems
- Development and administration of incentive schemes for Gencos and Discos

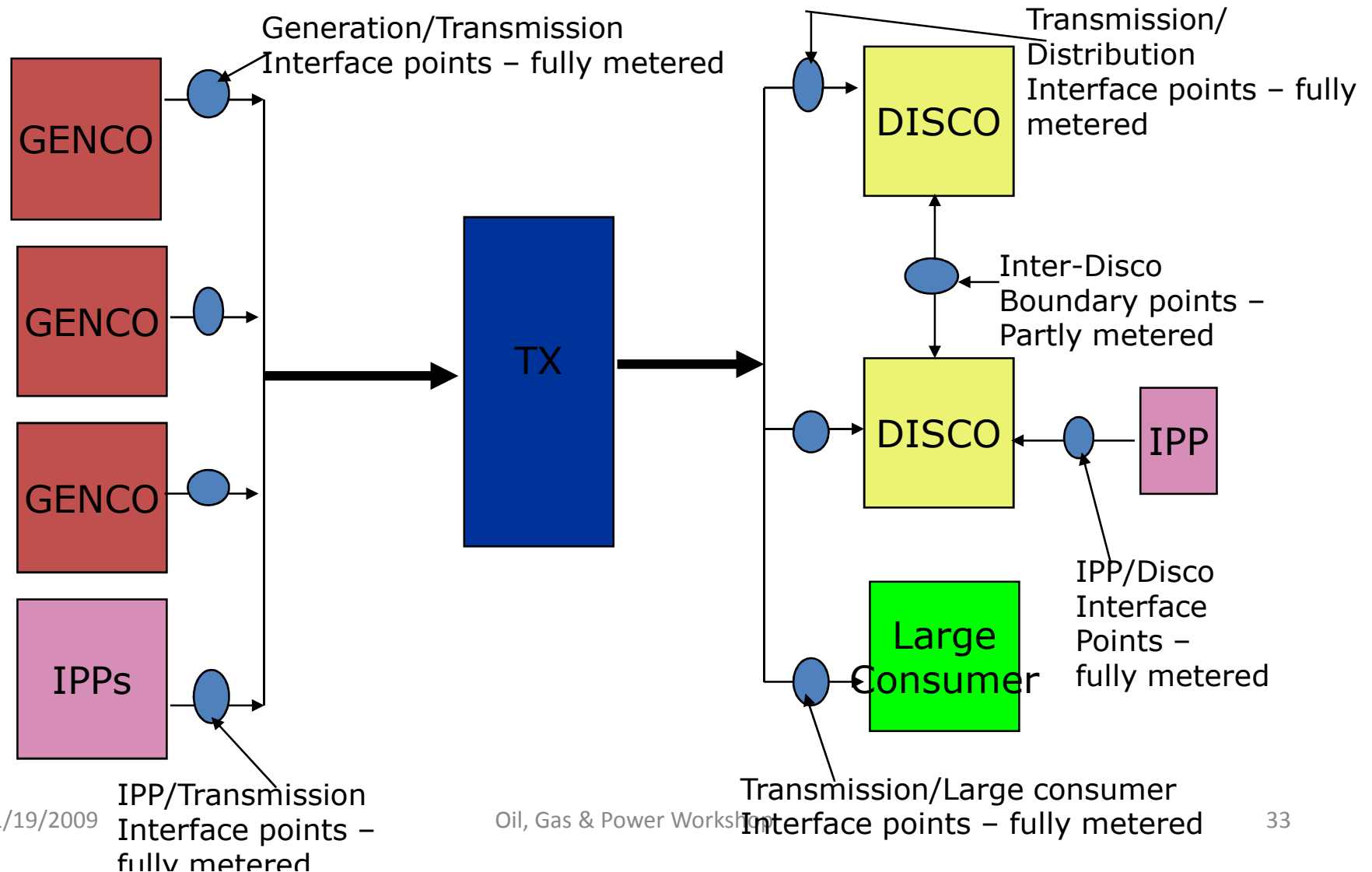
MO's specific activities in the Pre-Transitional Market

- Administration of subsidization and loan schemes for the Gencos and Discos
- Development and administration of schemes for discount on accelerated payments and interest charges on delayed payments
- Management of the existing PPAs and ICs
- Organizing workshops for Gencos and Discos on Market Rules, Market Procedures and Market participation
- **Some of the activities are aimed at achieving some of the objectives of the Pre-transition Market**

Identification and metering of the trading points



Status of Trading point metering



Wholesale Electricity pricing during the pre-transition market – Transfer Pricing

- Transfer pricing shows how costs of business activities along the functional components of the industry (from generation to retail) are recovered from the final consumers
- Price at the generation/transmission interface point is the total cost of generation business

Transfer pricing (cont'd)

- Price at the transmission/distribution interface point is price of generation plus cost of transmission business . Wholesale prices of electricity to the distribution companies are determined at these points
- Wholesale generation and transmission prices are designed to recover full generation and transmission operating costs only, wholesale distribution prices also allow for full distribution operating cost recovery. Capital cost recovery is not possible in all

Transfer Pricing (cont'd)

- Generation and transmission prices fixed according to MINIMUM FUNDS requirements
- Wholesale distribution prices are reviewed quarterly in line with some revenue mgmt efficiency improvement projections
 - Pricing mechanism provides incentives for achievement of target efficiencies
- Recovery of CHQ costs through the wholesale distribution prices, improves only with improving revenue mgmt efficiencies

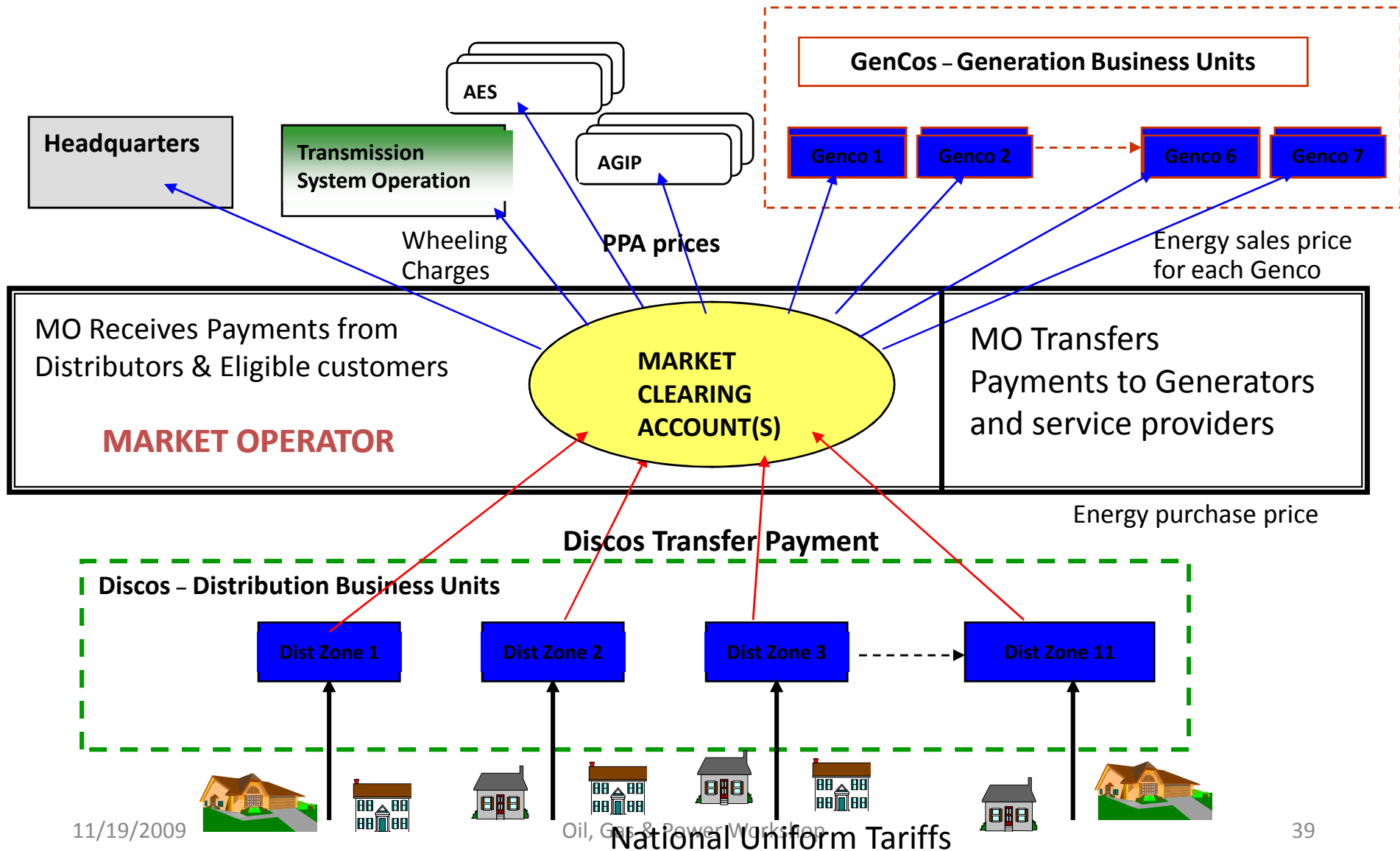
Transfer Pricing :Issues

- Transfer prices deduced from and limited by the end-user tariffs
- End-user tariffs not cost reflective, therefore cannot support recovery of full costs of generation, transmission and distribution businesses through transfer pricing
- Collection efficiency low, further reduces ability of cost recovery from the end-user tariffs, and transfer prices

Shadow Trading: - Trading during the Pre-transition Market

- Metering
- Settlement
- Payment

The Trading Arrangement - Post unbundling



Meter Data Management (MDM)

- Manual readings
- Distribution zones:
 - Read by representative of Disco and SO
 - Formalised in signed reading, sent to MO
 - Problems: delays, inconsistencies, mistakes, cross feeders and shared meters arrangements
- Power stations:
 - Read and sent by SO to the MO
 - Formalised in signed reading
 - Problems: Sales of generation is at injection point to the grid
- Manual input and data validation by IT
- Testing when problems identified in data validation

Settlement

- Transfer prices:
 - Purchases of Discos from Gencos at uniform prices
 - Each Genco has its own price
 - IPPs sell with PPA prices
 - Transmission wheeling: paid by Discos
 - MO transfer price to cover budget
- Special Funds:
 - Reserve: (headquarters) for emergency investment / costs
 - Transition: to fund Discos with insufficient funding
- A mechanism to allocate money collected from consumers between industry different activities and payment obligations
 - Not based on the Market Rules
 - BUT, extremely useful to test future vesting contracts prices and funding required for financial viability of the successor companies

Payment System

- Each Disco has Bank account for the Market – Settlement Accounts (escrowed for security of payments)
- According to payment calendar, payments are transferred from Disco Settlement Accounts to MO Clearing Accounts (7 in number)
 - Then MO transfers to Genco and headquarters accounts
- Market settlement not necessarily in balance
- Insufficient payment
 - Assistance to fund payments to Discos or Gencos through Transition Fund
 - If Fund insufficient, shortfall assigned to headquarters

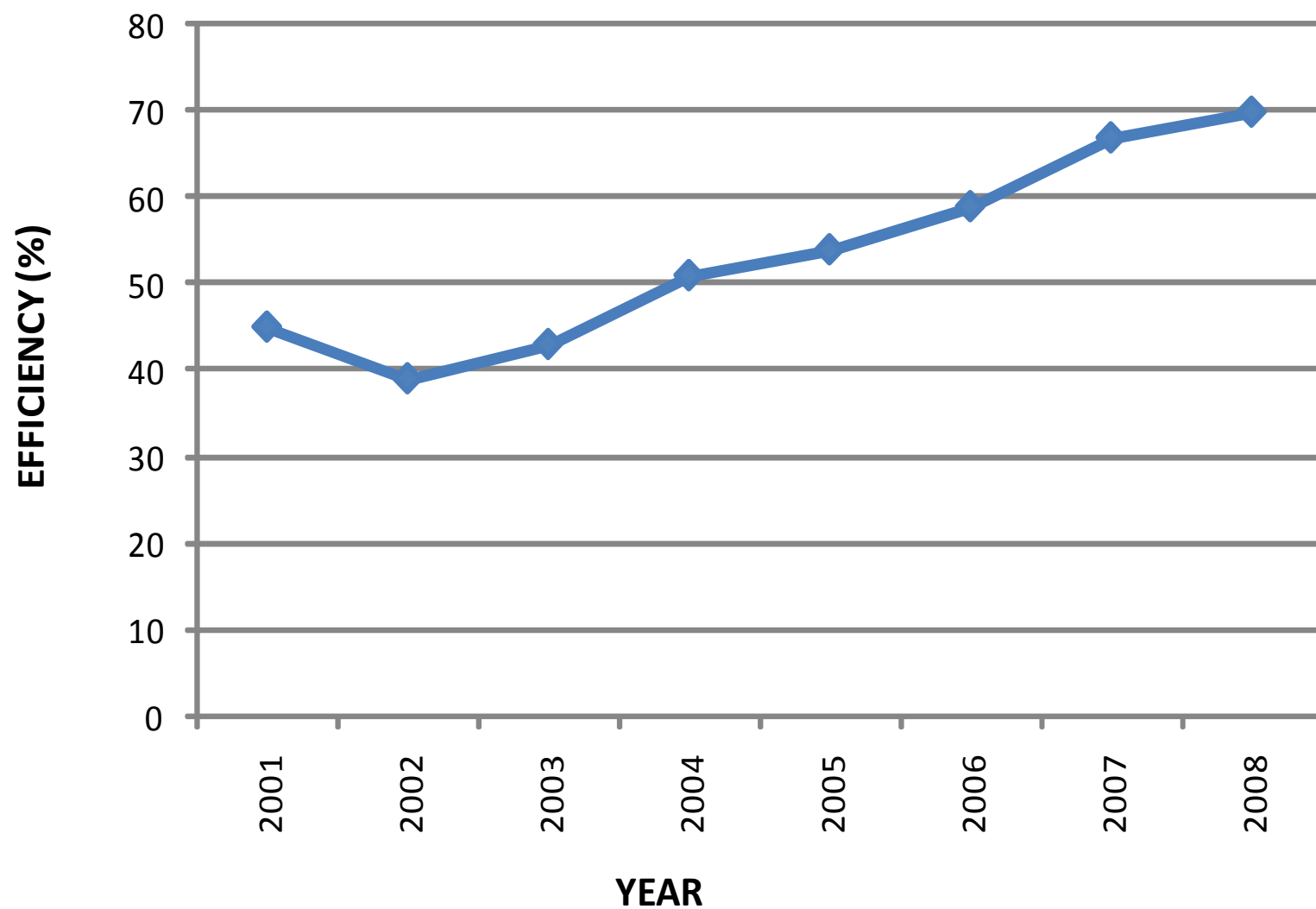
Incentive schemes to drive performance during the Pre-transition Market

- Targets & Incentives for the Discos
 - targets
 - Performance on the ISO Model (PIM)
 - Incentives
 - Bonuses
 - Awards of prizes eg, pick-up vans, Buses etc
 - Penalties
 - Letters of warning
 - Other penalty provisions in the scheme not implemented
- CABIS for the Gencos
 - Payments for every available capacity, whether generating or not

Visibilities of the Pre-Transition Market Operations

year	Ave. energy SO (GWh)	Ave. collection (NB)	Ave. total efficiency (%)	Ave. tariff (N/KWh)
2001	1,407	2.6	45	4.1
2002	1,729	4.0	39	6.0
2003	1,844	4.8	43	6.0
2004	1,942	5.9	51	6.0
2005	2041	6.5	54	6.0
2006	1,982	7.0	59	6.0
2007	1,846	7.4	67	6.0
2008	1,759	7.5	70	6.0

VISIBILITIES OF THE PRE-TRANSITION MARKET OPERATIONS



Key Pre-transition Market Issues

- Low energy generation
- Low revenue collection
- Grid and Payment indiscipline
- Understanding the Rules for the Market
- Minimum sanction for low performance

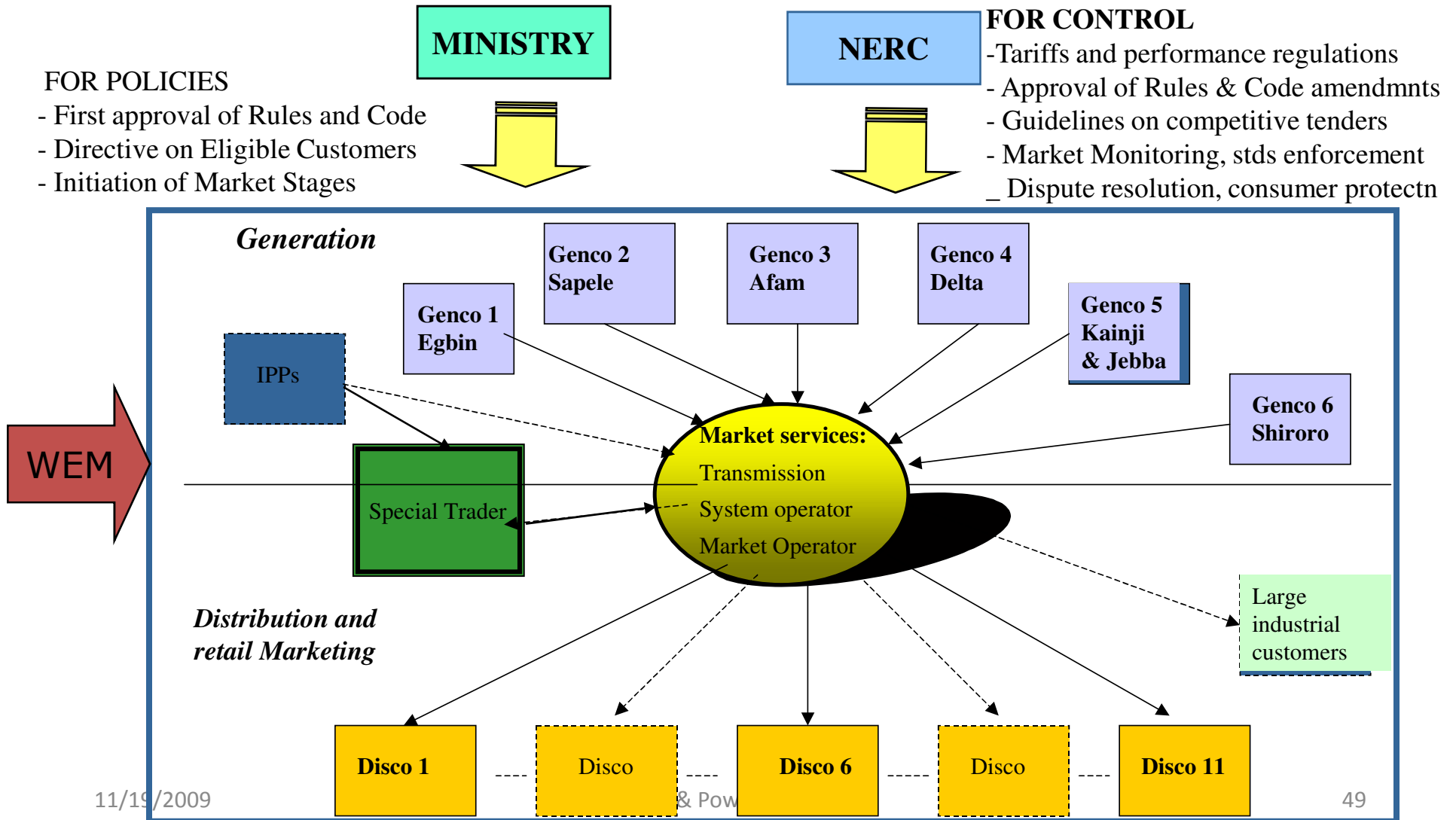
IV

Going into the Transition Market

Key Transition Stage Market Activities

- Expansion of generation and network capacities – the FGN setting the pace
- Efficient investment and improved private sector participation in the industry and encouragement of competition in new entrants for generation
 - Market Rules provide for tenders for new generation by the Special Trader
 - Act provides for Commission to issue guidelines for and supervise competitive tenders
- Full implementation of the Market Rules and Grid Code

The Transition Stage –The Sector Institutions/Market structure



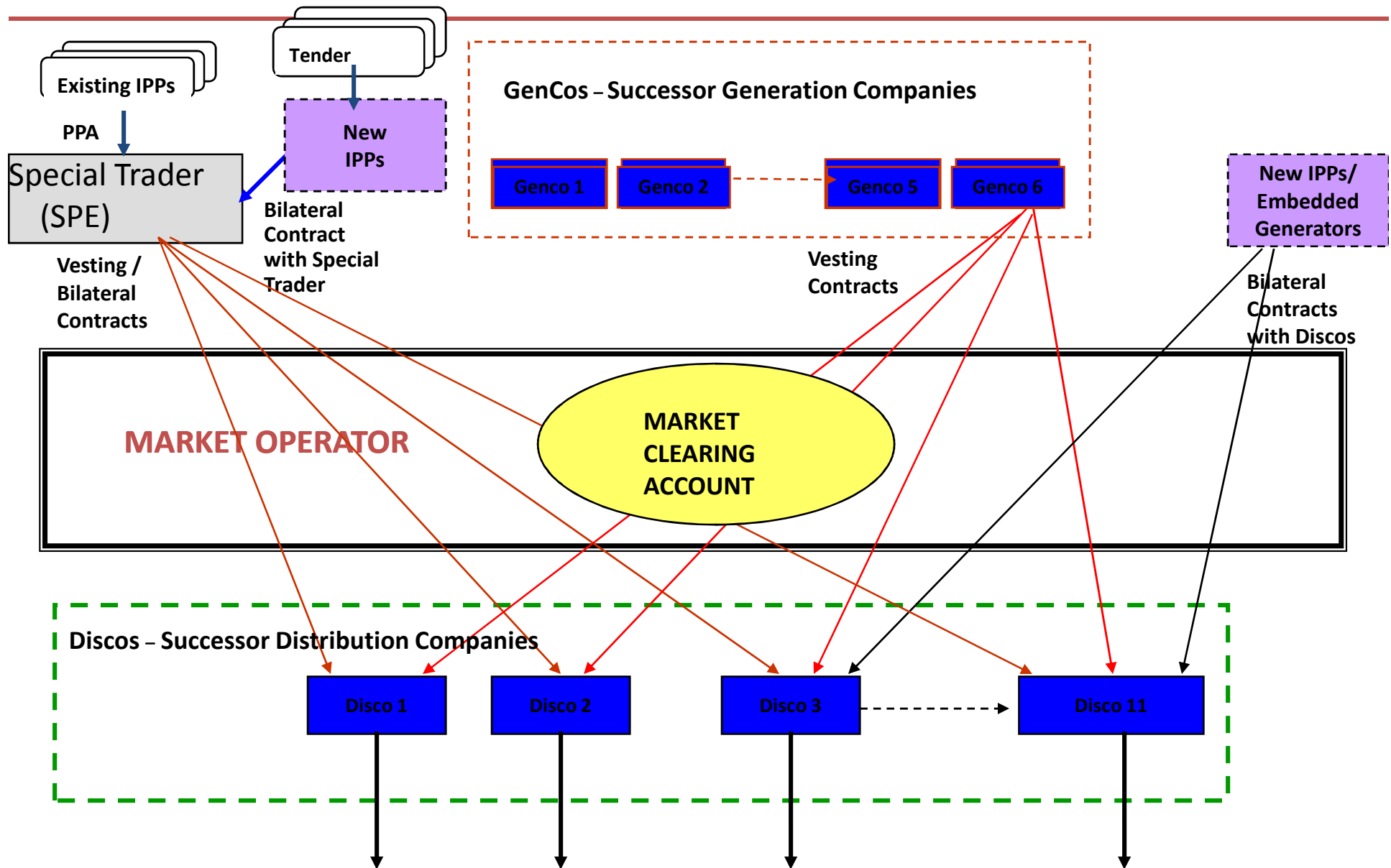
Transition Market Participants

- **Generators (sell in contracts)**
 - IPPs, successor Gencos
- **Distributors (Discos)**
 - Also licensed as marketers (purchase in contracts)
- **Eligible Customer (EC) and exports**
 - Ecs Still to be decided
- **Traders: bulk purchases and resale**
 - Special Trader (SPE takes care of PHCN assets & liabilities, eg the IPPs)

Transition Market Service Providers

- Market Operator
 - Commercial administration of the Market, using the MR
- System Operator
 - Technical administration of the energy Market using the Grid Code
 - Provides ancillary services for grid stability and power quality
- Transmission Service Provider
 - Provision of transmission access to both the generators and the distributors
 - Recognises transmission losses

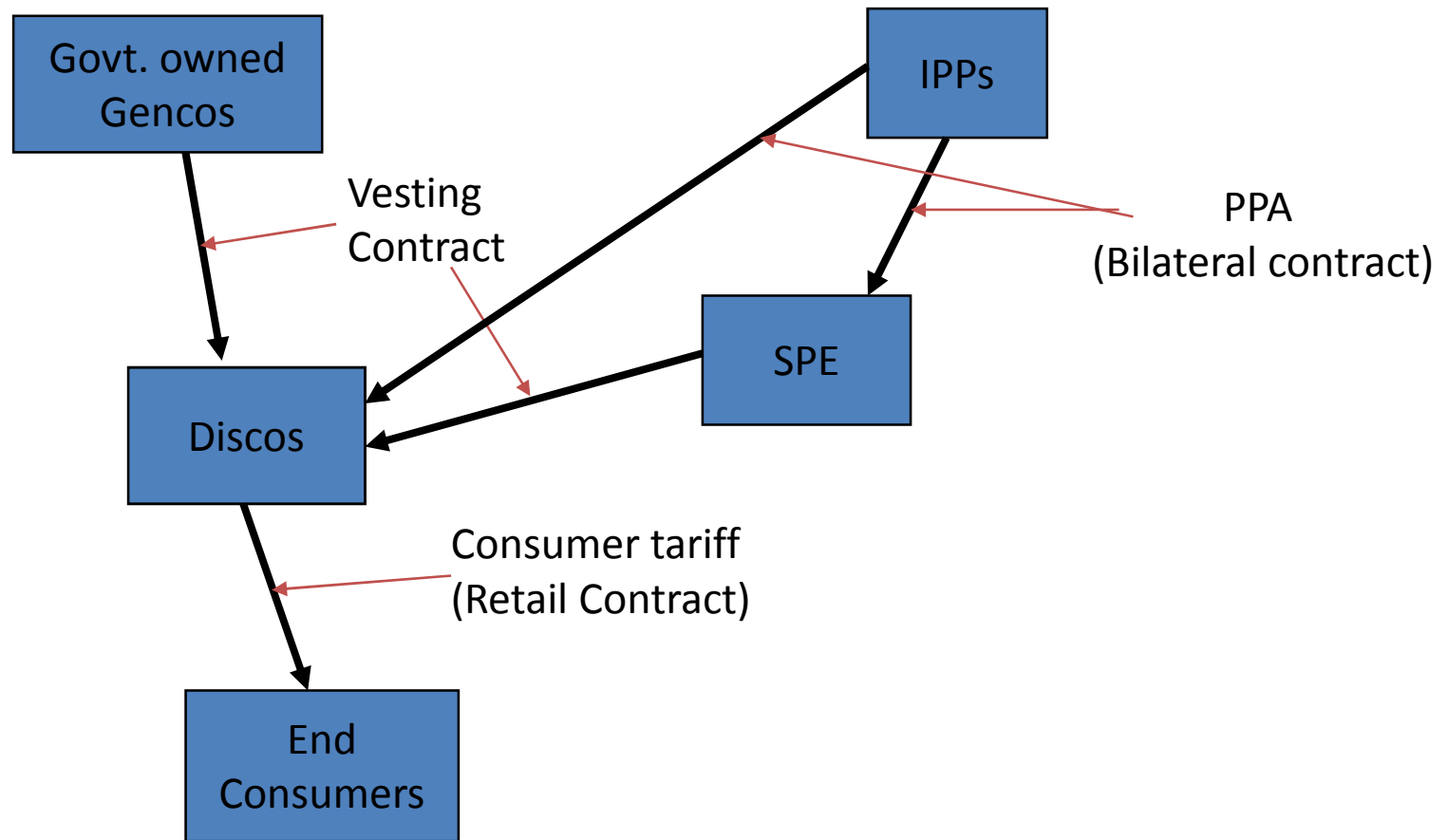
Transition Market Trading Arrangement



Trading during Transition Market (TM)

- All trading through contracts
 - Successor Companies with vesting contracts
 - Special Trader (SPE) with pre existing PPAs
- Each Disco will have portfolio of contracts with various Generators and with the Special Trader
- Each pre existent IPP will sell through its PPA to the Special Trader
- Each new IPP will have portfolio of sales contracts with Discos or contract with Special Trader

The TM - Integrated Contracts Market



Conditions Precedent for Trading during Transition Market

- Achieved
 - Market Rules, developed and approved
 - Grid Code, developed
 - Market procedures, developed
 - Trading points, about 96% fitted with efficient meters
 - Metering code developed, metering committee, in place
 - MYTO, ready with the wholesale prices, including vesting prices
 - Market participation Agreement and Participant Application Forms, developed

Trading : Conditions Precedent (cont'd)

- Not yet in place
 - Vesting contracts
 - Participation Agreement (yet to be signed)
 - Automated Meter Data Collection (MDC) system
 - Payment guarantees by the Discos
 - Special purpose entity (NELMCO)
 - Stakeholder Advisory Panel
 - Dispute Resolution Panel
 - Settlement software
 - Shared feeder metering
- Subsidy Must flow monthly (or end- user tariffs must be cost reflective) for market credibility
- 'Not yet in place' MUST be achieved during the GO LIVE stage in preparation for the GO ACTIVE stage

Commercial Metering and MDM

- Trading points & Metering specification
 - Communication for remote access, back up meters
- Registration of existing metering system
- Periodic testing of metering system
- Market metering Procedures:
 - Data collection procedure
 - Shared meter and cross feeder procedure
 - Data validation and corrections procedure
 - Complaints, faulty meters, missing data
- Monthly Metering Report with progress of quality in data collection (reading mistakes, delays) and development of Automatic Metering Infrastructure (AMI)

Transition Market: Settlement (1)

- Monthly Settlement
- Settlement of Markets and services administered
 - Transmission Charges of each Participant
 - Energy quantities in each contract, pre existing PPA
 - Settlement of special contracts
 - Ancillary services charges
 - Charges for services
 - Transmission, SO and MO
 - Corrections to previous settlements



Transition Market: Settlement (2)

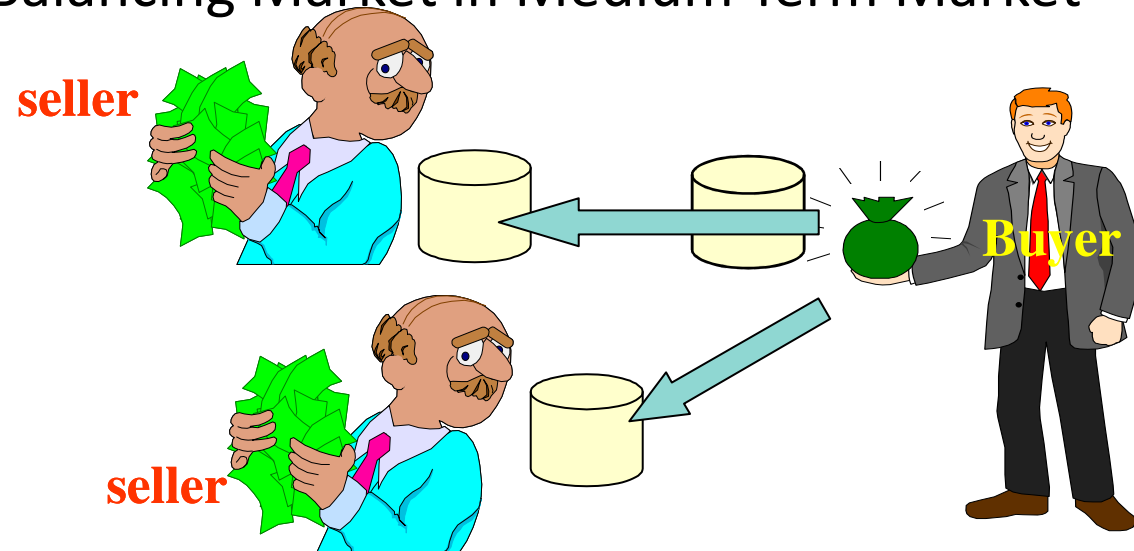
- MO prepares Settlement Statement with supporting data for Participants to understand and verify results
 - Preliminary Settlement
 - Participants review and can complain on inconsistencies or mistakes
 - MO and Participants try to reach agreement
 - Final Settlement
 - Includes corrections agreed
 - Participants must pay amount due according to this statement, even if dispute still exists on settlement data or calculations
- Basic market principle:
 - In Settlement Statement, each payment to a Participant (credit) must have a corresponding payment by (debit) other Participants to ensure a monthly zero balance – **Market Equilibrium**

Transition Market: Settlement (3)

- Settlement statement include only trading and services provided in wholesale market
- Replace transfer prices with vesting contract prices
 - Price that each Genco sells to each Disco
- Use of Settlement software
- Monthly Settlement Report

Sharing generation; Market Settlement

- Monthly for each Disco
 - Each Buyer is proportionally buying from each Genco & IPP (load allocations – Vesting contract quantities)
 - Future: Balancing Market in Medium Term Market



Transition Market Payment System

- Monthly payment
 - Month “m” settled and paid in month “m+1”
 - Similar to current IPP invoice and payment arrangements
- Payment System:
 - Transfers between Bank accounts
- Non payment:
 - Interests
 - Use of security deposit



Payment system

- Monthly payments, to enable Gencos fund their costs, including fuel costs
- Market procedure on administration of late or non payment
- Monthly Payment Report with progress on payment compliance and funding
- Payment Waterfall, to be applied in the event of revenue shortfalls

Transition Market : What to expect

- Monthly Rules Reports
 - Report on the performance of the market, participants' compliance with the MR. Rules Report also used by the Commission for Market governance
- Settlements
 - Will use Contract quantities and prices (as in PPAs , Vesting Contracts)
- Payments
 - Will insist on payment guarantees to avoid market disequilibrium
 - All Discos must pay invoices in full
 - All Generators, including IPPs, and TCN must receive payments in full
- Stakeholder incomes to be in line with MYTO provisions and not the Minimum Funding principle used during the Pre-transition stage

Issues and challenges going forward

- Ensuring that all players understand and abide by the Market Rules and procedures
- Completion of the Gap Analysis Project
 - Protection CTs used for metering
 - Development of AMR and AMI for efficient MDM
- Setting up of the SPE
- Development of the Vesting Contracts
- Power supply inadequate for sustainable consumer confidence, resulting in low collections and inadequate participation in wholesale trading
- Development of relationships among all players in the sector

Summary

- Shadow market operation was initiated in Nigeria in 2005 with the functional separation of components of the Industry
- The Pre-transition stage is the learning curve which the industry has almost gone through
- With the industry unbundling substantially achieved, the Regulatory Commission in place, approval of the Market Rule by the President, the metering of the trading points, development of the Metering Code and development of the MYTO, to provide the Vesting Contract prices, the Market is set for the Transition Stage

Summary (cont'd)

- It is expected that most of the outstanding preparations (eg participant registration, etc) will be completed for the Transition Market to commence in the 1st quarter of 2010

From All Of Us In MO

**Thank you for
listening**

Our Web-site: www.onemng.org