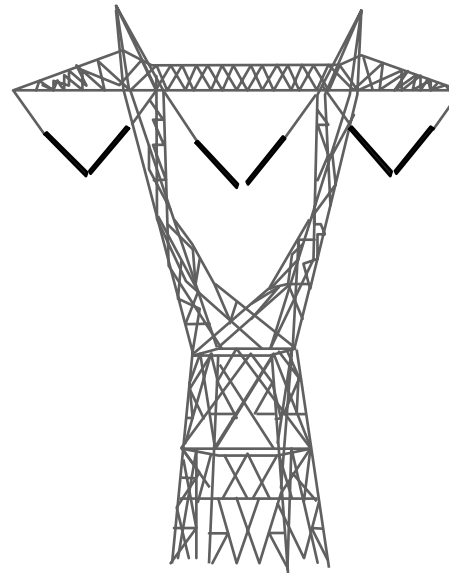


Reform and Evolution: The New Nigerian Electric Power Supply Industry (“ESI”)



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Outline

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Background

Key Dates

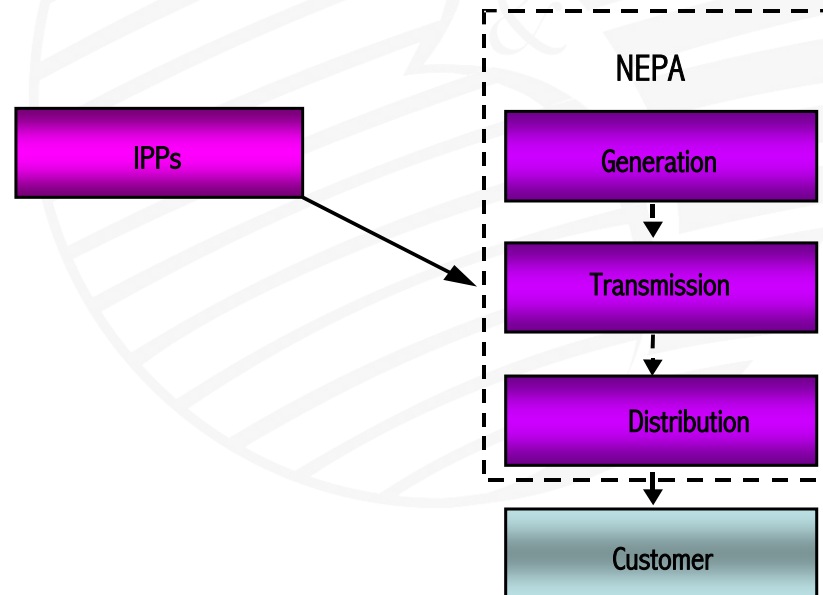
- ✦ 1896: 1st recorded electricity generation in Nigeria.
- ✦ 1929: 1st electric utility company “NESCO” commenced operations with construction of a hydro station at Kurra (near Jos).
- ✦ 1951: Electricity Company of Nigeria (“ECN”) established.
- ✦ 1956: Oji, coal powered station (4 units) commissioned.
- ✦ 1962: 1st 132 KV line constructed between Ijora (Lagos) & Ibadan; Niger Dams Authority (“NDA”) established to develop Nigeria’s hydro potential
- ✦ 1968: Kainji Hydroelectric Power Station commissioned
- ✦ 1972: ECN and NDA merged into National Electric Power Authority (“NEPA”)

Pre – reform legal framework

- ✦ Constitution of the Federal Republic of Nigeria, 1999;
- ✦ Electricity Act, Cap 106 LFN 1990 and its regulations:
 - ✦ Electricity (Private Licences) Regulations, 1965;
 - ✦ Electricity (Annual Returns) Regulations, 1974;
 - ✦ Electricity Installation Regulations, 1996; and
 - ✦ Electricity Supply Regulations, 1996;
- ✦ NEPA Act, Cap 256 LFN 1990;
- ✦ Energy Commission of Nigeria Act, Cap 109 LFN 1990;
- ✦ Utilities Charges Commission Act No. 104 of 1992;
- ✦ Electricity [Amendment] Act No. 28 of 1998;
- ✦ NEPA [Amendment] Act No. 29 of 1998;
- ✦ Companies and Allied Matters Act, Cap 59, LFN 1990; and
- ✦ Finance (Miscellaneous Taxation Provision) Act, No. 18, 19.

Background (cont'd)

- ⚡ NEPA, government owned integrated monopoly provider responsible for generation transmission, and distribution and sales.
- ⚡ 1998 amendments to Electricity Act and NEPA Act removed NEPA monopoly although it remained a vertically integrated provider.



- ⚡ However, NEPA failed in the discharge of its 4 main functions

Background: Pre-reform Realities

Generation

- NEPA's generating capacity comprised 3 hydroelectric & 6 thermal plants.
- Installed capacity of about 6,000MW: (1,900 hydro & 4,000 MW thermal).
- However, typical average generation at sub-optimal level of under 1500MW in 1998 and just 2700 MW in 2000.
- Problems in generation included:
 - no meaningful Capex since 1990;
 - inadequate fuel sources; and
 - irregular maintenance of generation facilities.
- Despite the IPP, EPP and ROT contracts executed since 1998 and Capex refurbishing existing plants, capacity is still grossly inadequate (presently 4,200MW against estimated demand of about 8,500MW; possible suppressed demand of another 5,000 MW).

Transmission

- Transmission capabilities inefficient and grossly inadequate (current systems capacity estimated at 5,838MVA, actual may be less).
- Archaic radial transmission structure, which does not allow for system reliability.
- Irregular maintenance and lack of facility upgrade.
- Vandalisation of transmission infrastructure.
- Absence of state-of-the-art dispatch facilities.
- High technical losses.

Distribution

- Inadequate distribution capacity of about 8,425MVA.
- Uneconomic tariffs kept below the actual cost of production.
- Lack of proper system planning, leading to fragile and overloaded distribution network.
- High technical and non-technical losses (current estimate of 45%).
- Inaccurate billing and poor revenue collection.
- Vandalisation of facilities.
- Corruption.

Background: Imperatives for reform

- ✦ The imperative for ESI regulatory and market reform was reinforced by the FGN's adopted developmental and economic growth goals:
 - ✦ The National Economic Empowerment and Development Strategy (NEEDS) which details the national economic goals and ideal macroeconomic framework; and
 - ✦ The Millennium Development Goals (MDGs) for social and economic development in Less Developed Countries (LDCs).
- ✦ NEEDS' major reform agenda:
 - ✦ Empowering People;
 - ✦ Promoting Private Enterprise; and
 - ✦ Changing the way the Government Works.

Background: Imperatives for reform (cont'd)

- ⚡ NEEDS set average growth rate target of 7 – 10% by 2007.
- ⚡ To achieve set targets, ESI must at least, attain:
 - ⚡ generation capacity of 10,000MW;
 - ⚡ transmission capacity of 9340MVA;
 - ⚡ distribution capacity of 15,165MVA;
 - ⚡ increased tariff collections from about 70% to 95%;
 - ⚡ reduction of transmission and distribution losses from 44.5% to 15%; and
 - ⚡ reduction of controllable cost by at least 30%.

Reforming the Nigerian ESI: Preamble

- ✦ Clearly industry had to be restructured and a reconstructed legal and regulatory framework put in place.
- ✦ Thus:
 - ✦ 1998: statutory amendments: “de-monopolisation” of NEPA;
 - ✦ November 1999: Electric Power Sector Reform Implementation Committee (EPIC) inaugurated by the National Council on Privatisation (NCP) to “*recommend measures for sector reforms, promote the policy goals of liberalisation, competition and private sector led growth and superintend draft of new bill*”;
 - ✦ Process driven by the Bureau of Public Enterprises (engaged international consultants and advisers);
 - ✦ March 2001: NCP issues the National Electric Power Policy, which defined framework for power sector reform;
 - ✦ August 2001: NCP issues final draft Electric Power Sector Reform Bill; and
 - ✦ March 2005: Electric Power Sector Reform (“EPSR”) Act enacted.

Reforming the Nigerian ESI: Dialectics of Reform

In 1999/2000, there were two competing views on reform strategy

Strict Reformists

- ✎ Immediate wind down of NEPA and vesting in holding company.
- ✎ Establish independent regulator immediately (offshore consultants as regulator in interim).
- ✎ Restructure, liberalise and unbundle NEPA; in the interim, provide EPPs.
- ✎ Deregulate pricing.
- ✎ Fast track new law.
- ✎ Expedite privatisation.
- ✎ Ensure incentives to attract O&G JVs and new money.
- ✎ No FGN guarantees.
- ✎ No substantial new FGN Capex on generation and low wire.
- ✎ Create a competitive market as soon as possible.

The Evolutionists

- ✎ Substantial FGN Capex to immediately improve systems.
- ✎ FGN to issue guarantees to secure selected new players – IPPs, EPPs and ROTs.
- ✎ Initiate phased reform, liberalise and deregulate the industry.
- ✎ Hold NEPA until privatisation.
- ✎ Phased privatisation and unbundling.
- ✎ Gradual introduction of regulator, commencing with training for proposed regulatory commissioners and staff.
- ✎ In the long run, market structure should be as uncomplicated as possible, with very limited (max 2) bulk purchasers from Gencos.
- ✎ Draft and enact new law.

Reforming the Nigerian ESI: The Adopted Strategy

- ✦ The main elements of the reform strategy adopted by the FGN were:
 - ✦ increased funding of the ESI in the short-term to improve the state of power infrastructure;
 - ✦ boosting generation by executing IPP, EPP and ROT contracts, e.g. Enron-AES Barge; Agip (Kwale); Ibom, Geometric Cluster Pilot Project, Afam and other public sector projects – Gereggu, Omotosho, Papalanto, Alaoji, Delta III;
 - ✦ liberalisation and privatisation of the power sector, to create a fully competitive market:
 - ✦ process phased over transition, medium and long term stages; and
 - ✦ transition over stages, driven not by time, but by occurrence of pre-defined evolutionary conditions
 - ✦ new regulatory and statutory framework (Policy and EPSR) to promote competition and market transparency, and establish a private sector driven ESI.

Reforming the Nigerian ESI: Principles for Reform

- ✦ Elements of the reform strategy included:
 - ✦ restructuring NEPA into NBUs and a Special Purpose Entity – a financial vehicle for stranded liabilities;
 - ✦ creation of a wholesale electricity market based on bilateral contracts; the market will eventually transit into a fully competitive retail market;
 - ✦ guaranteed access to the transmission grid for Genco and Distcos;
 - ✦ establishment of an independent regulator to undertake efficient, fair, impartial and light-handed regulation;
 - ✦ gradual removal of price subsidies; and
 - ✦ separate focus on rural electrification.

Reforming the Nigerian ESI: The EPSR Act

- ⚡ Key provisions of the EPSR Act:
 - ⚡ unbundling of NEPA and the establishment of successor NBUs (Part 1);
 - ⚡ six (6) competing generation companies (to be privatised);
 - ⚡ one (1) transmission company; and
 - ⚡ eleven (11) distribution companies (to be privatised);
 - ⚡ development of a competitive electricity market (Part II);
 - ⚡ establishment, functions and powers of the regulatory commission (NERC) (Parts III & VII);
 - ⚡ establishment of Consumer Assistance Fund to subsidise underprivileged electricity consumers (Part VIII); and
 - ⚡ establishment of Rural Electrification Agency (REA) and fund to increase rural access to electricity (Part IX).

Reforming the Nigerian ESI: The Unfolding Paradigm

Pre-Reform

- ⚡ NEPA: a statutory corporation
- ⚡ Vertically integrated utility, with generation, transmission and distribution integrated in NEPA
- ⚡ NEPA: Monopoly service provider
- ⚡ Sector regulated by NEPA and Federal Ministry of Power and Steel (“FMOPS”)
- ⚡ Top-down planning and information control by NEPA
- ⚡ Third party access (by IPPs, EPPs & ROTs) to transmission system dependent on agreement with NEPA

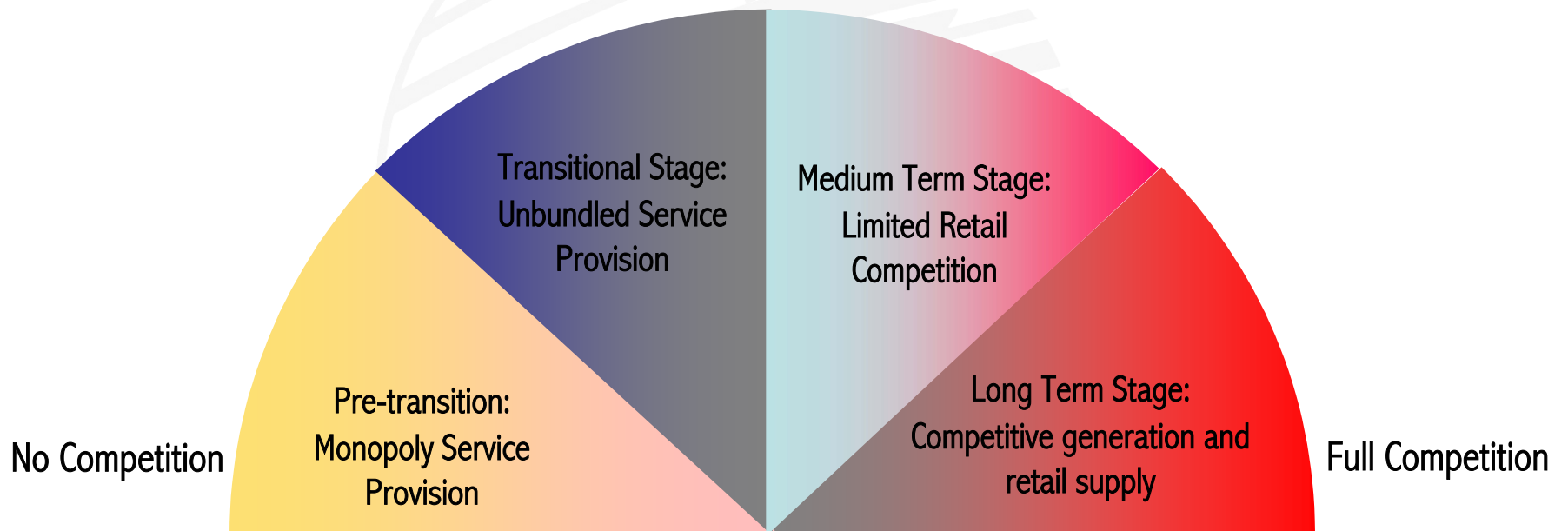


The Evolving Structure

- ⚡ NEPA transforms into PHCN, a PLC
- ⚡ PHCN unbundled into 18 NBU’s and an SPE and its functions transferred to new Gencos (6), Transco (1) and Distcos (11)
- ⚡ Competitive, market based bilateral trading
- ⚡ NERC, new regulator, independent of government and NBU’s
- ⚡ Independent system and market operator responsible for centralised operation
- ⚡ Non-discriminatory, open access to transmission system ensured by system operator

Market Evolution

The Nigerian ESI is designed to **evolve** from the current monopoly service provision, to a fully competitive market.



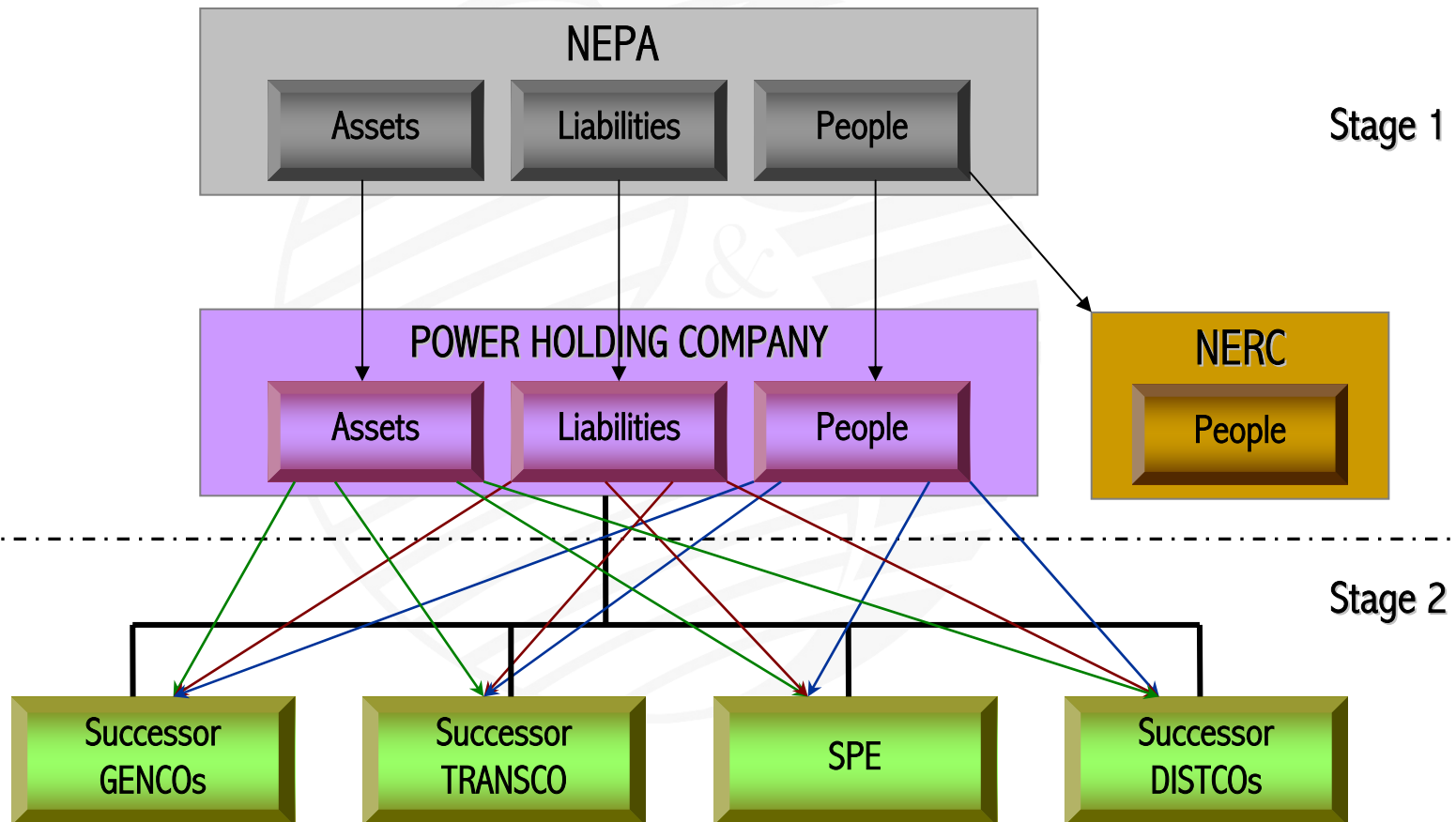
Key factors at each stage: clearly defined criteria for transition to next stage & avoidance of stranded costs

Market Evolution: Pre-Transition

- ⚡ Currently ESI at pre-transitional stage (market to be created)
- ⚡ Functional unbundling of PHCN into 18 business units
- ⚡ Minimum conditions for initiation of the transitional stage include:
 - ⚡ Unbundling of PHCN into NBUs and establishment of SPE
 - ⚡ Start-up of NERC and training of officials
 - ⚡ Preparation and approval of governance documents: Market Rules and Grid Code
 - ⚡ Transfer of obligations under existing PPAs, EPPs and ROTs to relevant successor

Market Evolution: Pre-Transition (cont'd)

Preparing for the Market: Unbundling NEPA



Source: Wole Obayomi, Overview of the Electric Power Sector Reform Act, 2005

Market Evolution: The Transitional Stage

- ⚡ This transitional stage will commence upon corporatisation of PHCN's successor entities:
 - ⚡ Incorporation and transfer of employees, assets, liabilities and other undertakings to the NBU's; and
 - ⚡ Transfer to SPE, of PHCN's liabilities and energy purchasing obligations that are not transferable or which require Government subsidies.

Main Features

- ⚡ Diversification of generation and distribution activity
- ⚡ No retail competition
- ⚡ The trading arrangements will be contractual, through vesting contracts
- ⚡ Market will be open to entry, with competitive procurement of new generation
- ⚡ System and Market Operation function will be resident in Transco

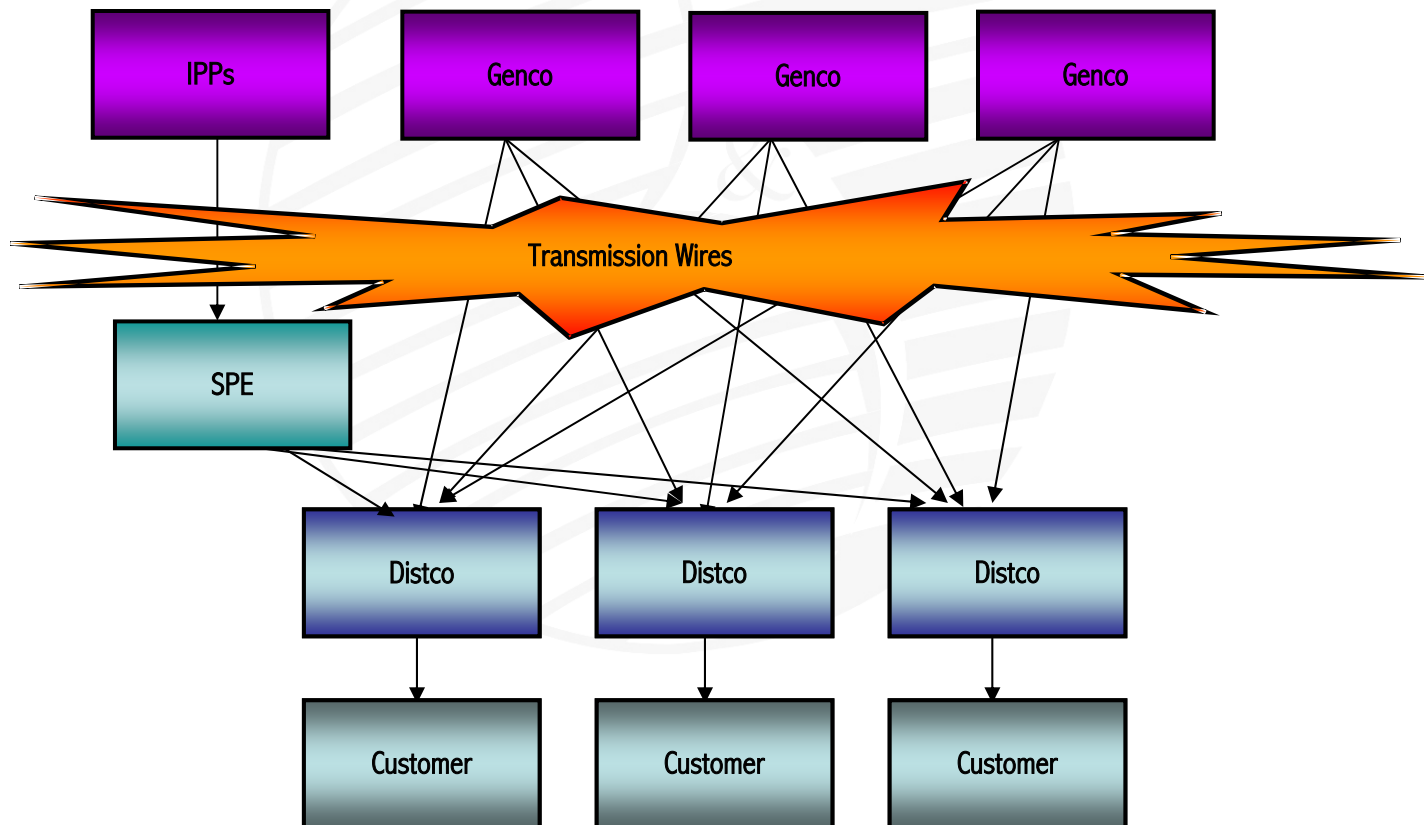
Market Evolution: The Transitional Stage (cont'd)

Main Features (cont'd)

- ⚡ Each Genco will sell energy and generation capacity through contracts
- ⚡ All consumers will buy from a Distco (Eligible Customers will not participate)
- ⚡ The System Operator will give economic dispatch priority over any commercial agreements
- ⚡ In preparation for the medium term, the Market Operator will calculate marginal costs, as shadow Balancing Market prices
- ⚡ The System and Market Operators will implement the Grid Code and the Market Rules
- ⚡ Gencos and Distcos will enter into Transmission Use-of-System contracts with Transco for use of the transmission system
- ⚡ Tariff regulation: Tariffs to be regulated by NERC, based on approved methodologies:
 - ⚡ Full cost recovery plus reasonable investment returns
 - ⚡ Incentive-based to reward continued technical improvement and efficiency
 - ⚡ Tariff differentiation/ cross subsidisation – section 76(5)

Market Evolution: The Transitional Stage (cont'd)

The Transitional Stage Market



Market Evolution: The Transitional Stage (cont'd)

Market Participants

- ⚡ Participants may be buyers or sellers of electricity
- ⚡ Buyers include:
 - ⚡ Distcos, who will buy from Gencos, SPE and existing IPPs, EPPs and ROTs
 - ⚡ SPE, who will assume responsibility for PPAs and contracts that are not transferable or require Government subsidies
- ⚡ Sellers
 - ⚡ Gencos
 - ⚡ Existing IPPs, EPPs and ROTs, who agree to participate in the market and are approved as participants
 - ⚡ SPE, which will sell energy it buys to the Distcos at a uniform Bulk Supply Tariff regulated and approved by NERC

Market Evolution: The Medium Term

Conditions for initiation

- ⚡ Privatisation or concessioning to private operators, of all thermal generation
- ⚡ Privatised distribution will represent at least 85% of sales to end-consumers
- ⚡ Ministerial directive under section 24(3) EPSR Act

Main Features

- ⚡ SPE will cease to buy/sell energy (section 26(1)(a) EPSR Act)
- ⚡ Each Genco will decide investment and entry at its own risk
- ⚡ Eligible customers connected directly to the Grid will be allowed to contract directly with Gencos and will no longer be subject to a regulated tariff

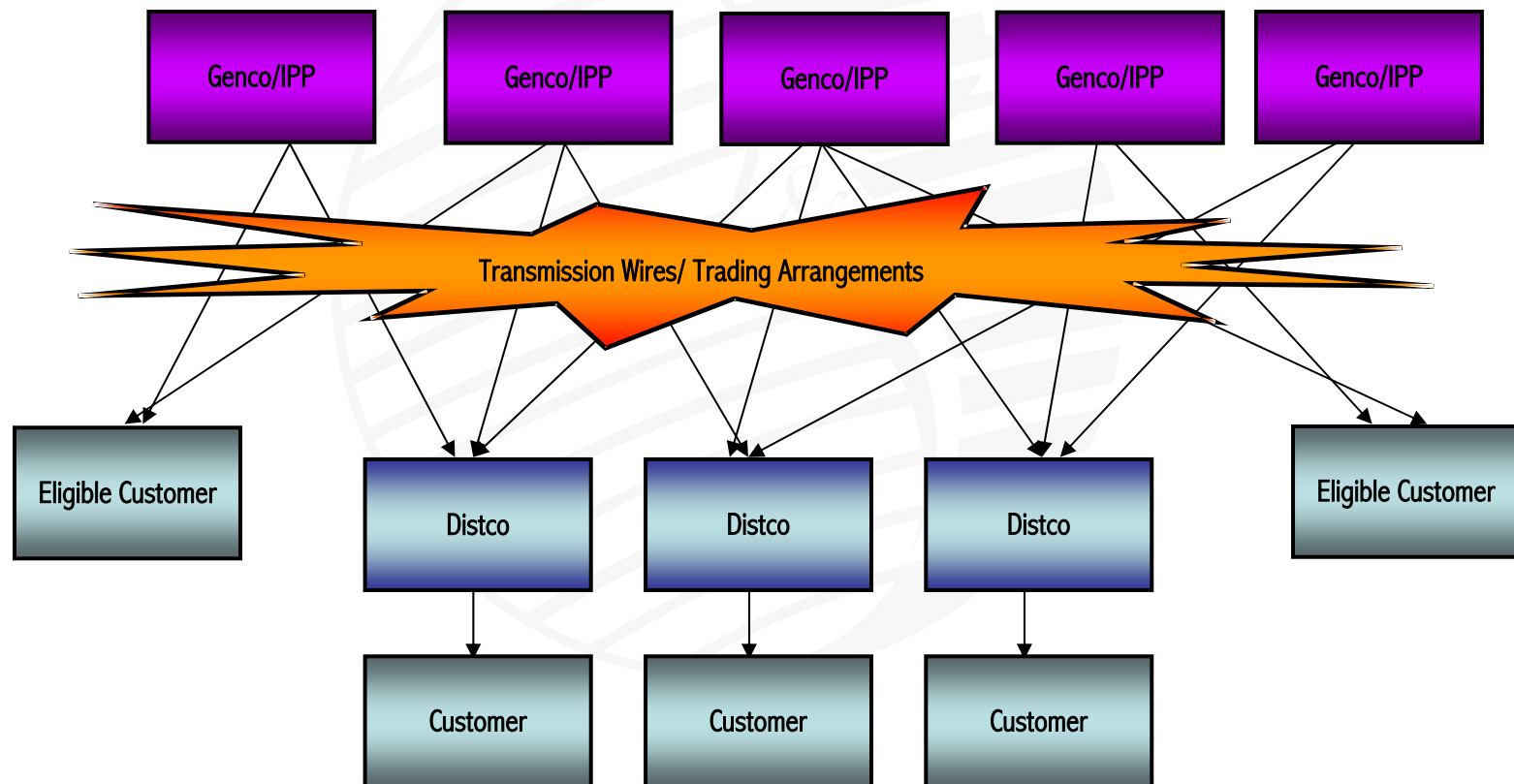
Market Evolution: The Medium Term (cont'd)

Main Features (cont'd)

- ⚡ Non eligible customers in a Distco's franchise area would remain captive of the respective Distcos, who will be obliged to contract for generation capacity to cover their expected demand
- ⚡ Marketing will be recognised as a separate activity and Distcos will be required to keep separate accounts for distribution and marketing businesses
- ⚡ Trading arrangements will comprise:
 - ⚡ a non-centralised market for trading bilateral contracts; and
 - ⚡ a centralised Balancing Market administered by the System and Market Operator to trade imbalances, based on day ahead nomination and economic dispatch
- ⚡ The System and Market Operator will procure Ancillary Services needed for the reliable operation of the system

Market Evolution: The Medium Term (cont'd)

The Medium Term Market



Market Evolution: The Medium Term (cont'd)

The Balancing Market

- ⚡ This is a market of last resort where every Market Participant can buy or sell (at fair market prices) energy and other services when their own generation or consumption does not match their contract positions
- ⚡ Operated by the Market Operator on an open and non-discriminatory basis
- ⚡ Energy is bought and sold in each half-hour at the System Marginal Price (SMP): the most expensive flexible unit of energy accepted in an economic unconstrained dispatch
- ⚡ Settlement will be done on a monthly basis

Market Evolution: The Long Term

Conditions for initiation

- ⚡ There is sufficient generation capacity to meet demand with adequate margins of reserve
- ⚡ The transmission system is sufficiently reinforced to connect the different regions of the country without over-congestion

Main Features

- ⚡ Separation of distribution and marketing businesses, so that:
 - ⚡ Distcos will only undertake wires or network business
 - ⚡ Each Distco's marketing activity would be spun off into an independent business
 - ⚡ Independent marketers may emerge

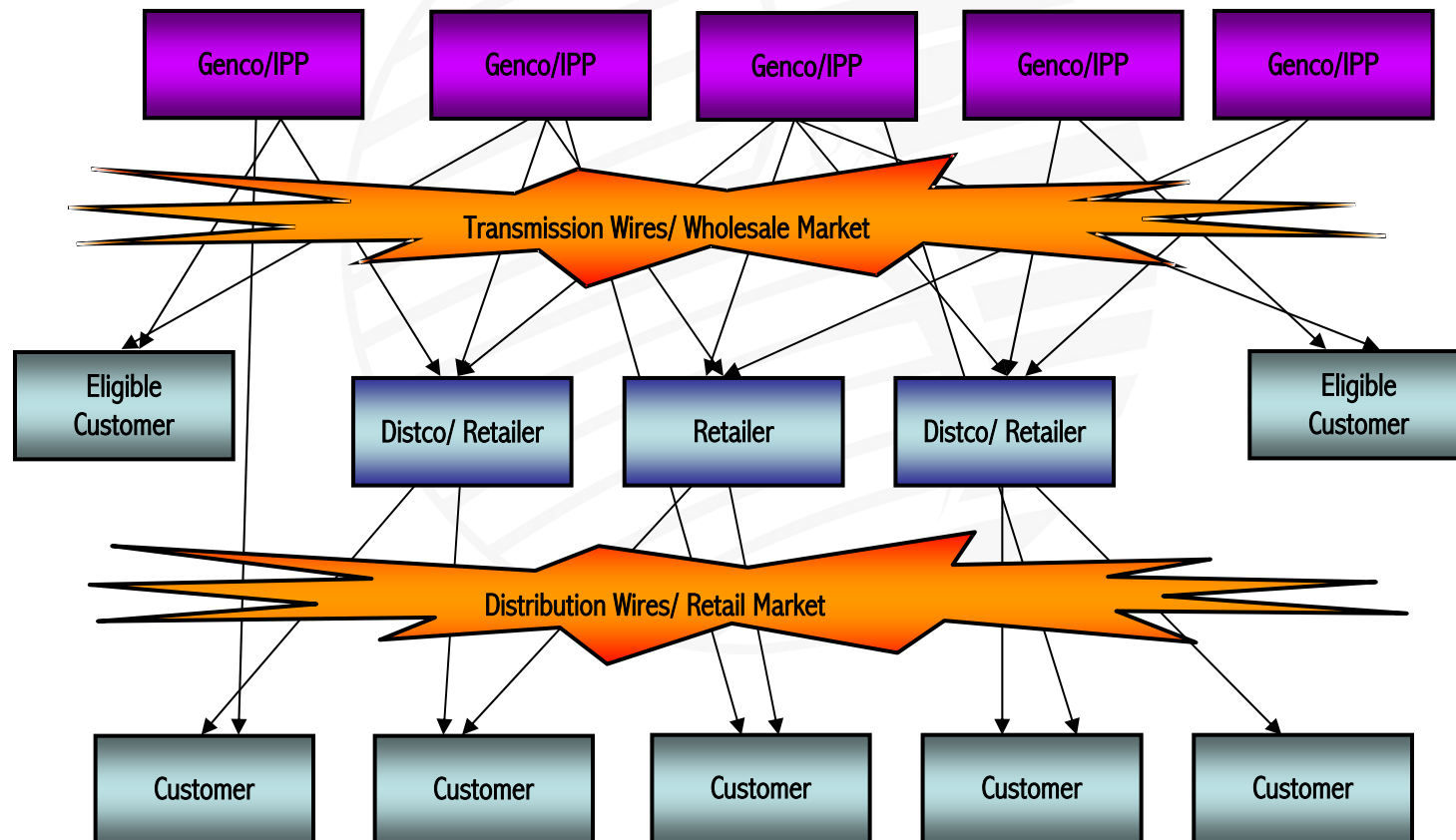
Market Evolution: The Long Term (cont'd)

Main Features (cont'd)

- ⚡ The System and Market Operator may be separated from Transco
- ⚡ Introduction of retail competition
 - ⚡ Independent marketers and Distcos will enter into Distribution Use-of-System contracts
 - ⚡ Non-eligible end-use customers may choose own supplier
- ⚡ Generators and marketers may combine

Market Evolution: The Long Term (cont'd)

The Long Term Market



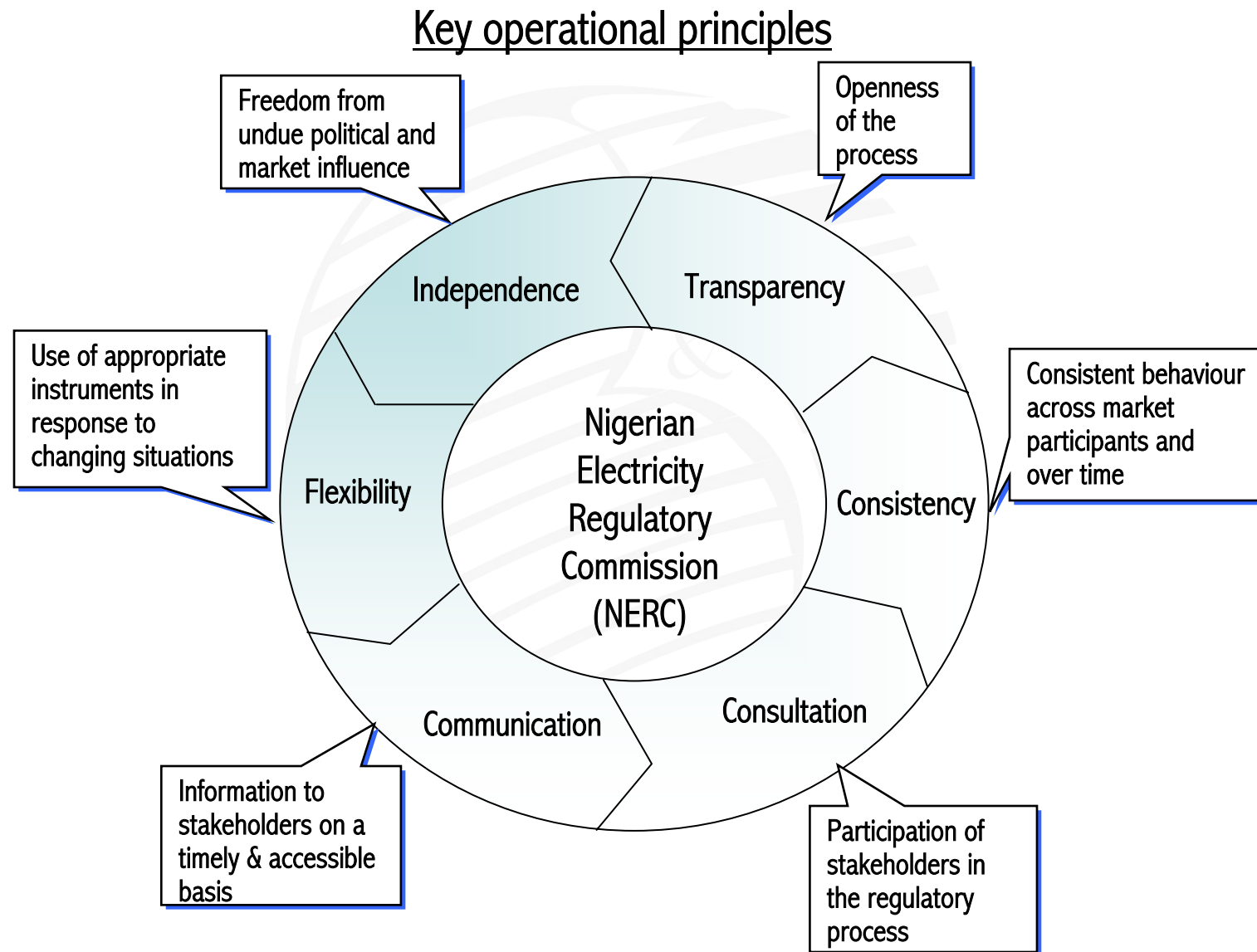
Regulation and Governance: NERC

- ⚡ Under the EPSR Act, NERC replaces FMOPS as sector regulator; FMOPS role now limited to general policy direction
- ⚡ Part III of the EPSR establishes NERC as independent regulator (funding & security of tenure) to:
 - ⚡ create, promote, and preserve efficient industry and market structures and ensure the optimal utilisation of resources for the provision of electricity services;
 - ⚡ maximise access to electricity services and ensure adequate supply to consumers;
 - ⚡ ensure that tariffs are fair to consumers and are sufficient to allow the licensees to finance their activities and to allow for reasonable earnings for efficient operation;
 - ⚡ ensure the safety, security, reliability, and quality of service;
 - ⚡ ensure that regulation is fair and balanced for licensees, consumers; investors, and other stakeholders; and
 - ⚡ present quarterly reports to the President and National Assembly on its activities.

Regulation and Governance: NERC (cont'd)

- ✦ To further those objectives, NERC's functions include:
 - ✦ promotion of competition and private sector participation, when and where feasible;
 - ✦ establishment/approval of operating codes and safety, security, reliability, and quality standards;
 - ✦ establish appropriate consumer rights and obligations;
 - ✦ license and regulate industry participants. Licensed activities are:
 - ✦ electricity generation exceeding 1MW;
 - ✦ electricity distribution exceeding 100KW;
 - ✦ electricity transmission;
 - ✦ system operation; and
 - ✦ electricity trading;
 - ✦ approve amendments to the market rules; and
 - ✦ monitor the operation of the electricity market; etc.
- ✦ The key challenge for NERC is to establish itself as a credible and knowledgeable regulator which can protect consumers' interests without jeopardizing operator's financial viability and continuity of business.

Regulation and Governance: NERC (cont'd)



Regulation and Governance: Market Governance

- ✦ The governance system would comprise NERC and the System and Market Operators, as well as special committees, boards and panels, designed to ensure that:
 - ✦ Market Participants have adequate representation in matters that affect the system or market operation
 - ✦ shared problems can be discussed and solutions analysed, facilitating dispute resolution in an open and transparent manner
 - ✦ the development of the system and the Market as well as behavior of Market Participants, are monitored, in order to promote the identification and resolution of incidences of lack of competition, abuse of Market Power or other undesirable conditions

Regulation and Governance: System/Market Operation

- ⚡ The EPSR Act provides for a System Operator responsible for:
 - ⚡ generation scheduling, commitment and dispatch;
 - ⚡ transmission scheduling and generation outage co-ordination;
 - ⚡ transmission congestion management;
 - ⚡ international transmission co-ordination;
 - ⚡ procurement and scheduling of ancillary services and system planning for long term capacity;
 - ⚡ market administration of the wholesale electricity market, including the activity of administration of settlement payments, in accordance with the market rules; and
 - ⚡ such other activities as may be required for reliable and efficient system operation.
- ⚡ At the initial stage, this entity will be resident in Transco, although it may eventually be separated.
- ⚡ Conceptually, the system's operation role is different from market operation, and the functions will be handled by different departments.

Regulation and Governance: The Market Rules

- ⚡ The Market Rules define the electricity trading arrangements for the wholesale electricity market in Nigeria, including:
 - ⚡ rights and obligations of the Market Operator, the System Operator and Participants; and
 - ⚡ related interactions and general procedures.
- ⚡ Detailed provisions include:
 - ⚡ principles of market design and stages for implementation;
 - ⚡ admission procedures, and rights and obligations of Participants;
 - ⚡ rules for dispatch and contract nomination by Generators and validation by the System Operator and the Market Operator;
 - ⚡ rules for regional trading through international interconnectors;
 - ⚡ payments system and the administration of the market settlement system by the Market Operator; and
 - ⚡ governance, administration and enforcement.

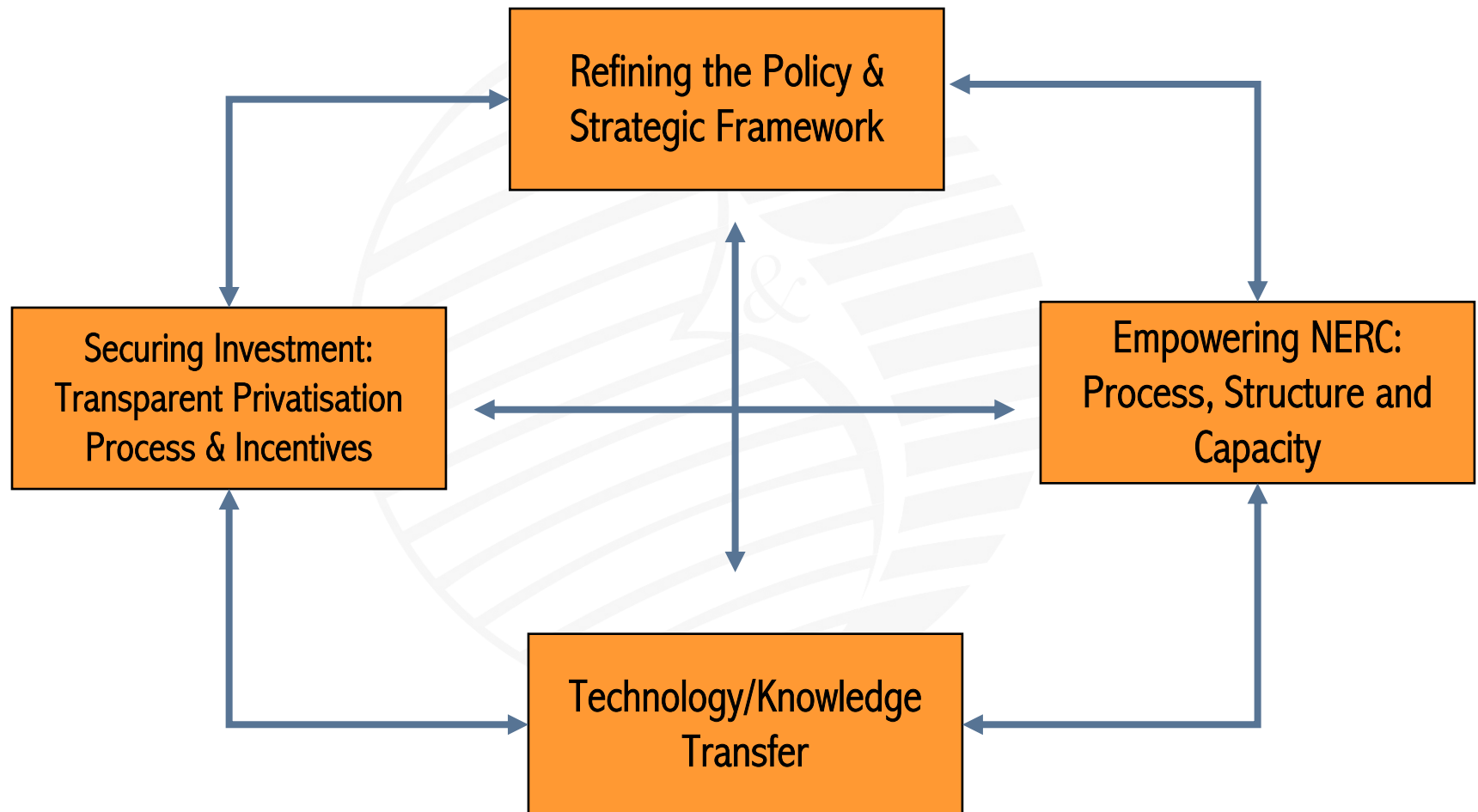
Regulation and Governance: The Grid Code

- ⚡ The Grid Code defines the rules for administration and operation of the transmission system, as well as technical procedures for the planning, co-ordination, supervision and operation of the system, including:
 - ⚡ reliability and quality of service criteria;
 - ⚡ operation and dispatch;
 - ⚡ transmission congestion;
 - ⚡ provision of ancillary services and must-run generation;
 - ⚡ system expansion; and
 - ⚡ new transmission connection, etc.

Where are we today?

- ⚡ PHCN successor NBUs have been incorporated, although yet to be effectively corporatised by transfer of employees and undertakings.
- ⚡ PHCN operations currently conducted through business units structured along the successor NBUs
- ⚡ NERC established:
 - ⚡ Commissioners (7) and initial staff appointed;
 - ⚡ Draft licensing regulations published.
 - ⚡ NCP/BPE set to commence privatisation process: advertisements issued for advisors
- ⚡ Convergence of power and gas: the G2P project

Implementation Challenges



Conclusion

- ⚡ An effective power reform is crucial for economic rebirth and the attainment of developmental goals. However:
 - ⚡ there are major challenges ahead.
 - ⚡ we need to continue to learn from other jurisdictions that have restructured and to tweak the reform process as we go along; and
 - ⚡ NERC needs to be truly independent and empowered.

Is our ultimate market structure over complicated?

Questions/Comments

