A ROUNDTABLE ON
THE ELECTRICITY ACT 2023

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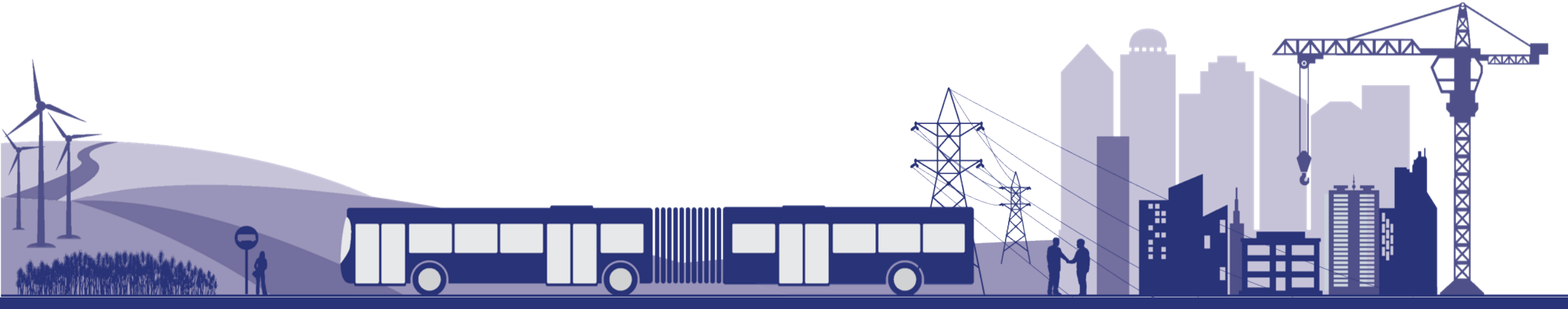
The Electricity Act, 2023: Imperatives and Opportunities for the States

Eyo O. Ekpo

October 2023



Outline

- Objectives of the Electricity Act, 2023
- Imperatives of State Electricity Laws
- Opportunities for State Electricity Laws

Objectives of the Electricity Act, 2023

➢Implementing Concurrent Powers in the 199 Constitution, as amended

- Clause 14b, Second Schedule, Part II:

  "A House of Assembly may make laws for the State with respect to…the generation transmission and distribution of electricity to areas covered by a national grid system within that State."
- Give back to States what military rule took away

➢Abolish The Single National Electricity Market

- Institutionalise an electricity supply tripod
  - National wholesale cross-border market – status quo
  - Sub-national, intra-State markets – evolving as States pass laws
  - Sub-national markets regulated from Abuja – automatic or States should request?

Imperatives of State Electricity Laws

➢ Recognition

- This is not about street lights and diesel generators across the State
- Neither is it about IGR from the regulator
- Electricity is a manufactured commodity, essential to living well and living long
- Electricity supply is useful only if reliable, i.e., available when needed and consistent in quality and quantity
- Reliability is assured only in a MARKET that has to be created from nothing
- Therefore, look actively for ANCHORS and MARKET MAKERS
- Subsidies are a drain that must be limited and very carefully-targeted

➢ Clarity and Simplicity

- Policy first, then Law
- Separation of policymaker from regulator
- Simplicity of regulatory and licensing structure
- Realisation that reaching the unserved is still an issue

Opportunities for State Electricity Markets

- Metering
  - Reduce cost of connections
  - Obtain commercial/coverage data
- IRP Study
  - Major planning and marketing tool
- Senatorial Districts for Distributed Generation/Mini Grids
  - Avoid traditional transmission grids
  - Attract patient, philanthropic capital
  - Create intra-State, decentralised markets
  - Separate wires from retail business
  - Catalyst for domestic gas markets
- Trend towards power pools
  - Future event preparation for which starts now

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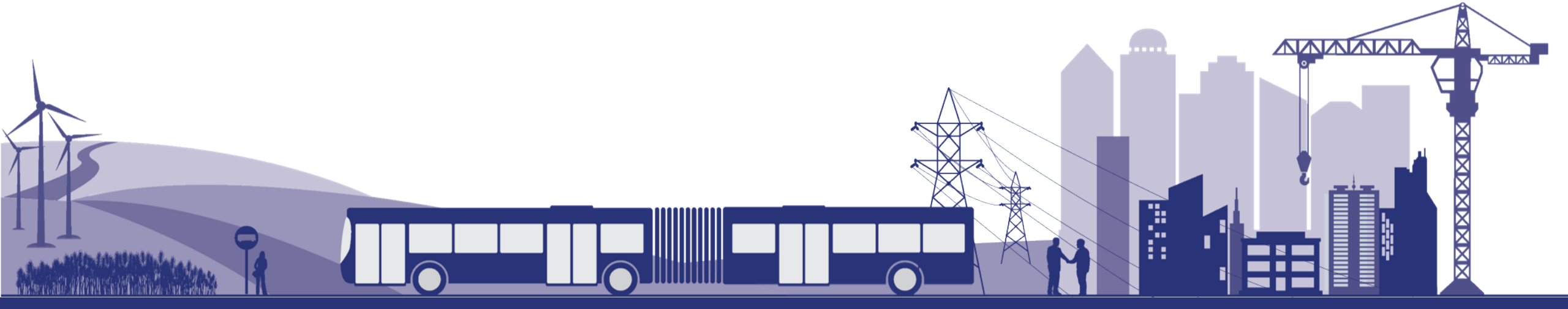
How Have Other Countries Approached This? Western Market Examples

John Gower

October 2023



The Context

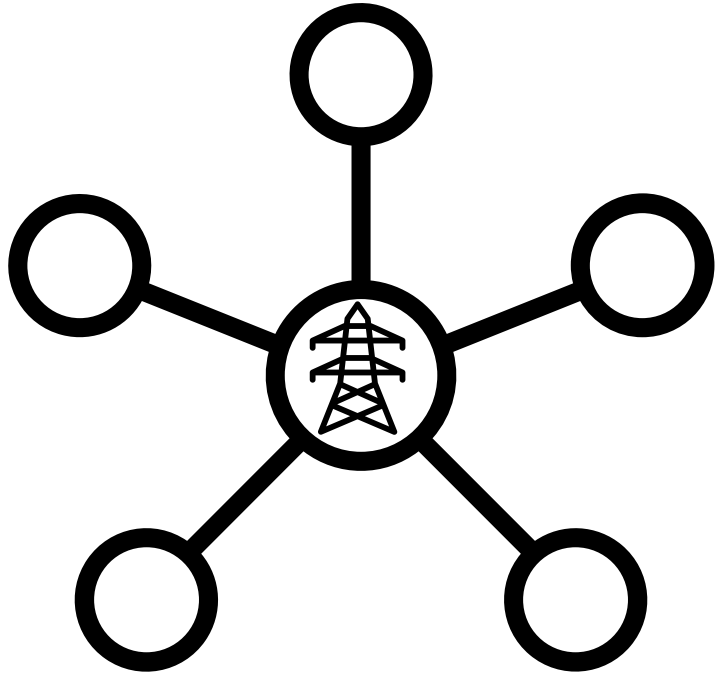
- History of enlargement and integration until the 1970s/1980s
- Power pools existed in some places
- The IPP Model – competition from generators for the market
- Creation of competitive markets, based on disaggregation, market structures, regulation

Experience in Western Electricity Markets

- Many new entrants, much investment, reliability maintained, greater transparency and cost reflectivity
- Gradual implementation; continuing reforms
  - (e.g. specialist markets, spot markets to contract markets)
- Markets have had to accommodate major changes, including:
  - New technologies
  - Changes in fuel availability
  - Environmental pressures (push for renewables)
  - Financial pressures
- Market have proved resilient – financial viability is key
- More challenges to come

Markets at Different Levels

- Supranational markets and their relation to national markets
- National or regional markets linking to state markets
- Local (decentralised) markets



Evolution of the EU institutional framework

Each Member State required to designed one or more competent bodies with the function of regulatory authorities

Each Member State required to designate a single national independent NRA

Establishment of an **Agency for the Cooperation of Energy Regulators (ACER)**

Enhancement of ACER and renaming of the "Agency" into a **"European Union Agency" for the Cooperation of Energy Regulators**

ACER

National) Regulatory Authorities (NRAs)

First Energy Package 1996	Second Energy Package 2003	Third Energy Package 2009	Clean Energy Package 2019

Transmission System Operators (TSOs)

Management and accounting unbundling of national TSOs

Legal unbundling of national TSOs

Choice between three models of unbundling of national TSOs

Creation of the **European Network of Transmission System Operators for Electricity** (ENTSO-E)

entsoe

Enhancement of ENTSO-E's tasks

Creation of the **EU DSO Entity** (distribution system operators)

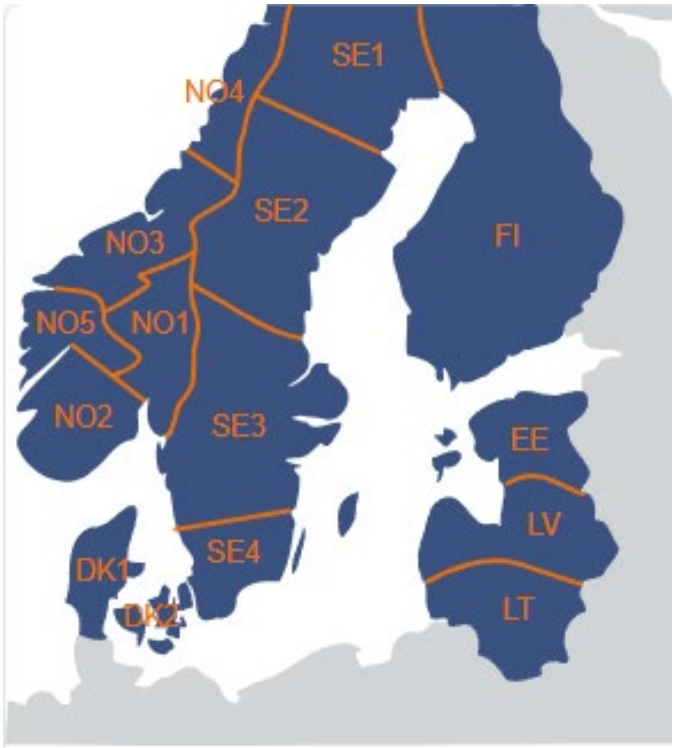
➢ **Note:**

- Market coupling
- Adaptation to clean energy

3

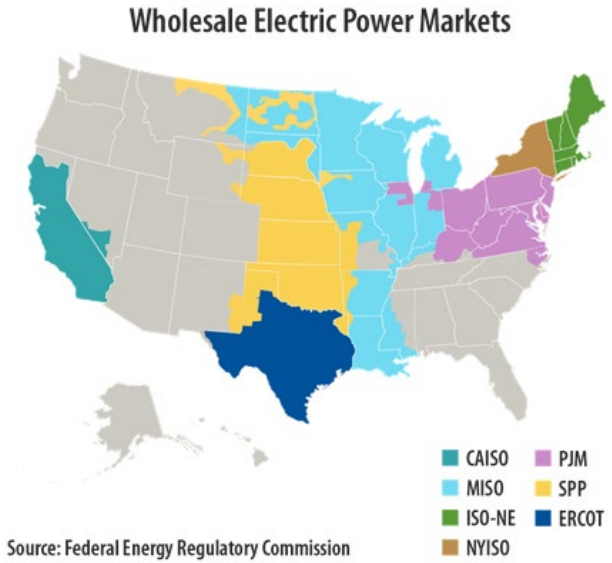
NordPool

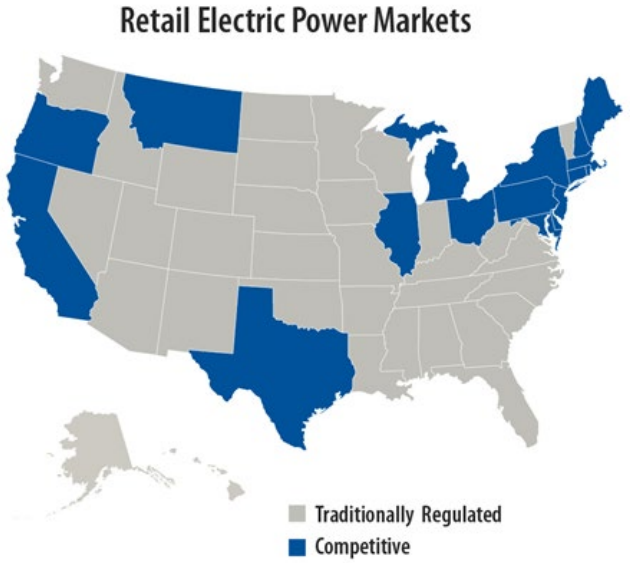
- Norwegian origins: power exchange for eastern Norway 1932, all Norway 1971 (118 power companies)
- Nordic restructuring: 1990s Norway then Sweden reformed, NordPool owned jointly by Norwegian and Swedish TSOs; contributed to unification of electricity markets
- Expansion as power exchange in northern Europe – day ahead and intra-day markets

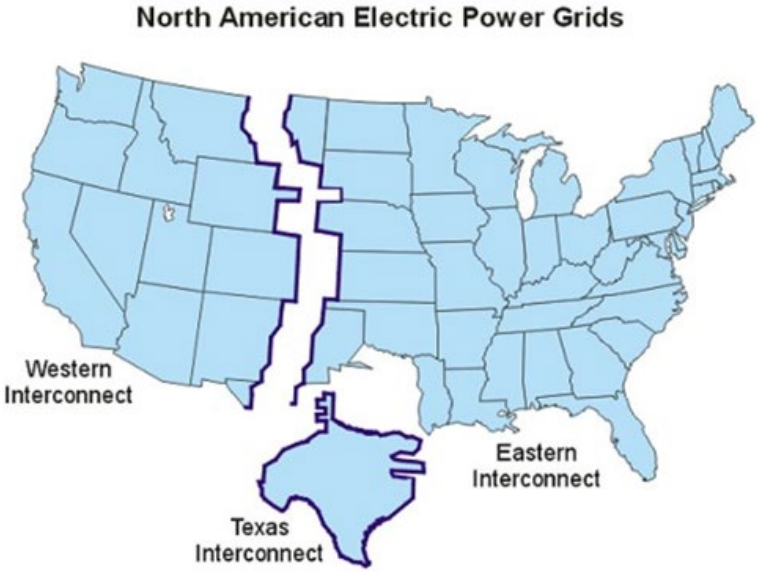


The USA: A Patchwork

- States have introduced different levels of disaggregation and competition
- 2 wide area grids (plus Texas); TSOs (ISOs or RTOs); Regional Reliability Councils (under NERC)
- Issues – past (California) and present







Local Markets

- Reflects decentralised generation in a system increasingly dominated by renewables (especially solar and wind)
- Links generation, storage and utilisation, via smart system operations based on LEM price signals
- Improved economics and reliability
- Various models – still pioneering stage

Concluding Remarks

- Balance political/management focus with economies of scale
- Reform is a process
- Need for resilience in the face of challenges, changes, innovation
- Need for attention to:
  - Sector governance
  - Financial viability
  - Markets and regulation
  - Infrastructure and processes

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Electricity Market: South East Asia and Indian Perspective

Prof Vigna Kumaran Ramachandaramurthy

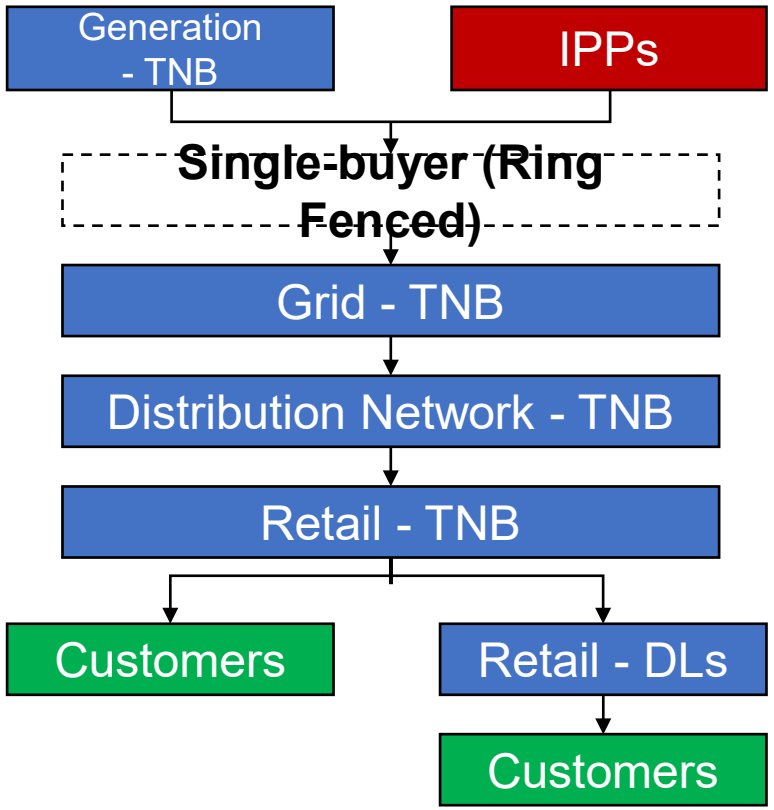
October 2023

Malaysian Market Structure

- The power sector in Malaysia had originally been a vertically integrated monopoly system
- The MESI 1.0 initiatives prompted the establishment of the ring-fenced Single Buyer model. Reason: Need to improve governance and decentralize and revise the regulations of the power structure.
- Past and current motivation for power sector liberalization.

Table 2.1: Summary of past and current motivation for power sector reform

	Malaysia Energy Supply Industry 1990s–2010	Malaysia Energy Supply Industry 2018–current
Motivation for reform	• Privatize TNB to create transparency in power market system. • Establish ring-fenced Single Buyer model (Single buyer and Grid system operator within TNB but separate financial account and operation) which happened in 2009 as part of MESI 1.0. • Encourage participation of IPPs in power generation sector to improve supply security and expand power capacity.	• Implement competitive electricity tariff by removing distortions, modifying the tariff structure, and increasing integration of renewables in the system. • Encourage third-party access to distribution and transmission system. • Decentralize and move towards capacity and energy market model to allow for more efficient and flexible use of resources.

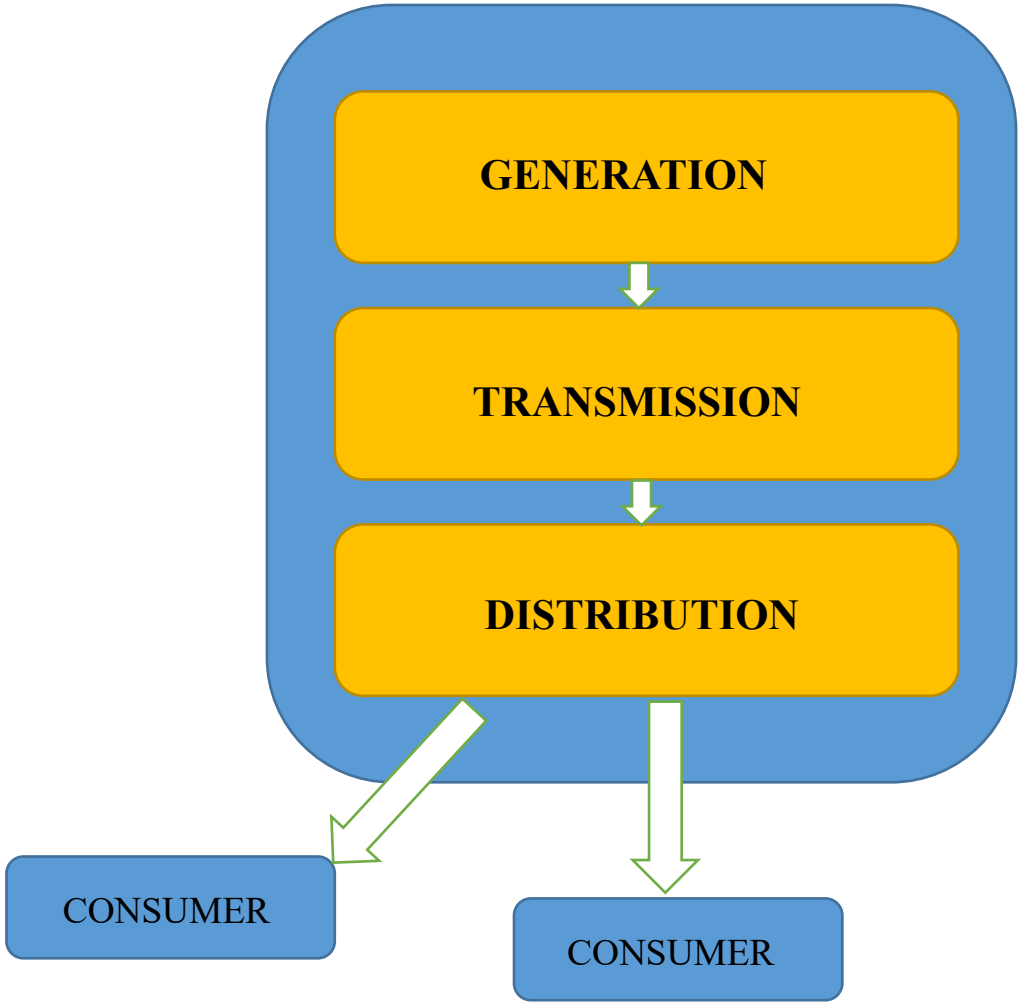


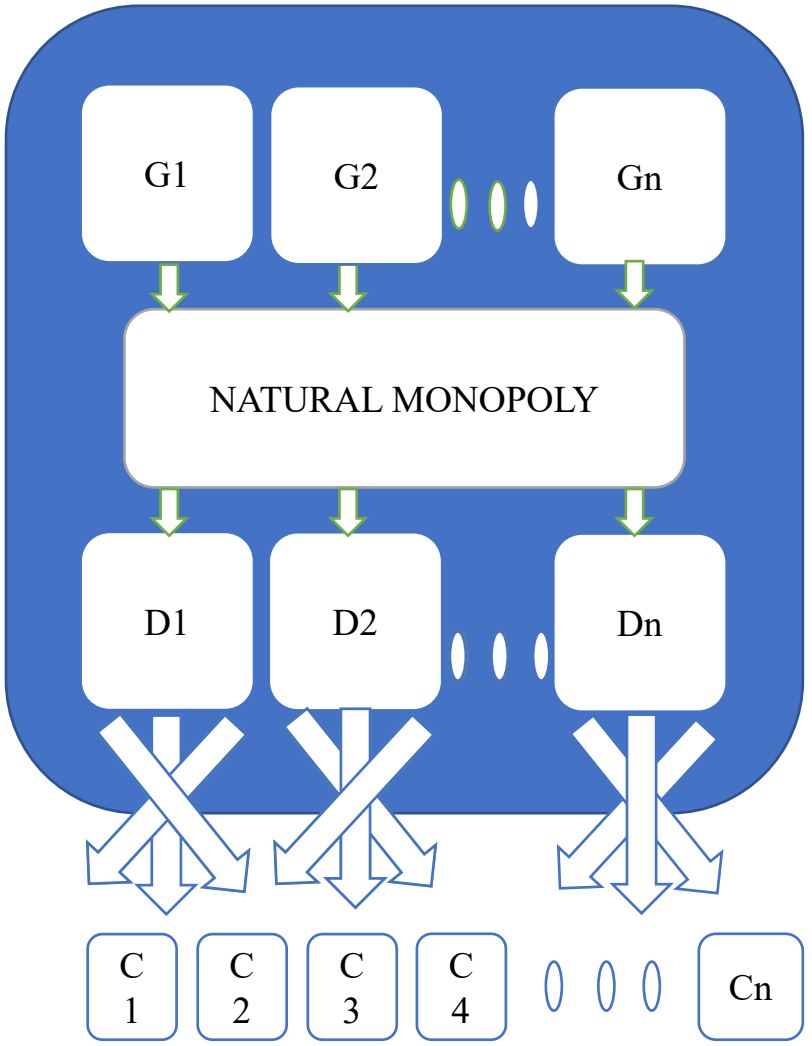
- In 2014, MESI has been unbundling accounts of the national electric utility into five separate entities: generation, single buyer, transmission, distribution network, and retail.

Single Buyer in Malaysia's Grid System

Benefits	Drawbacks
• **Cost transparency -** Single entity managing the generation mix in Malaysia. Rate of Single Buyer cost determined under IBR mechanism. Fair competition by various generation provider to procure into the grid. • **One Stop centre market structure -** simplified model where all generation deals with SB as the entity, similar with AEMO in Australia and Singapore • **Regulated entity -** SB is overseen by ST and hence operations are monitored by ST • **Demand management** - As the single buyer, SB has bird's eye view on total demand in the electricity network hence can make Call to Action (CTA) to other entity such as Grid System Operator (GSO) • **Cost effectiveness -** cost efficient structure as our Malaysia market is still cross-subsidized • **Grid stability -** the single structure model provides insight on energy supply and demand at HV grid level, provides proper operation to maintain the stability of supply, important to support and resolve the energy trilemma in Malaysia	• **Still not fully independent and impact on branding internationally –** this has always the major concern even at Govt level, whereby SB could still be under the influence of a licensee (TNB). Govt is looking into fully independent SB over ring fence. This is also in preparation for cross-border exchange transaction. • **Agility -** going through a single entity would means the electricity market is not as agile and flexible to generate and procure energy especially in micro-grid.. though our Msia market is highly regulated • **Efficiency -** As there's no competition in grid energy procurement, hence there's a risk of being inefficient compared to a liberalized market

VERTICALLY INTEGRATED STRUCTURE & SINGLE BUYER (UNBUNDLING)



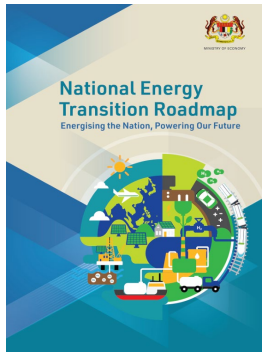


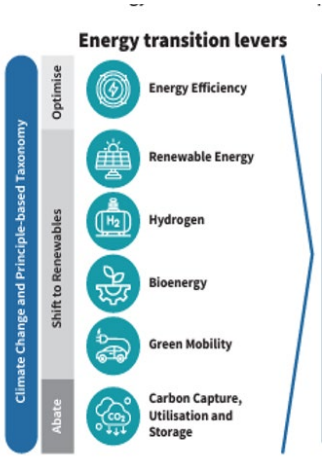
GENERATION: Competition is introduced to reduce prices

TRANSMISSION: Natural monopoly

DISTRIBUTION: Competition in Demand side ensures the gains for consumers

Key Targets in Malaysia





Renewable energy – Key Target

- 70% RE installed capacity share by 2050

Key Initiatives:

- Establish solar parks for accelerated deployment of utility-scale solar
- Promote floating solar and agrivoltaic technology
- Expand virtual aggregation model for rooftop solar
- Develop plan for accelerated investments of transmission and distribution
- Develop TPA framework for sourcing of RE
- Set up RE exchange hub to enable cross-border RE trading

Energy Efficiency - Key Targets

- By 2040, achieve energy savings of 21% compared to business-as-usual scenario.

Key Initiatives:

- Enforce mandatory audits for large commercial and industrial buildings
- Establish green building codes for energy-intensive residential and commercial buildings

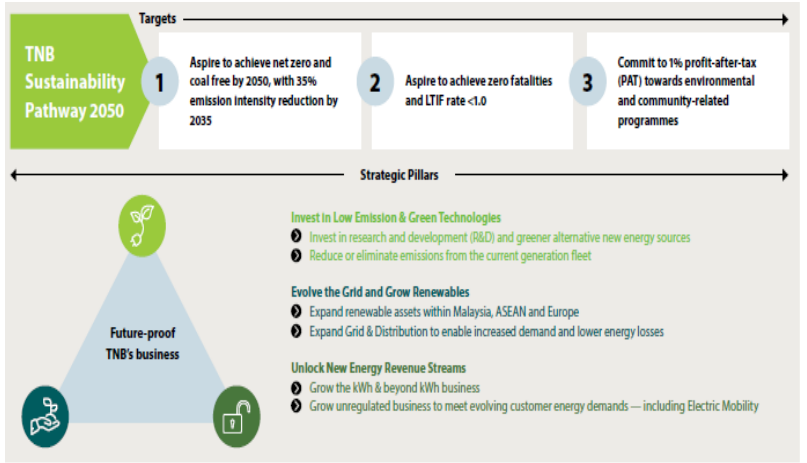
Green Mobility

NETR builds on existing national targets outlined by the Low Carbon Mobility Blueprint (LCMB).

- Accelerate the penetration of EV.

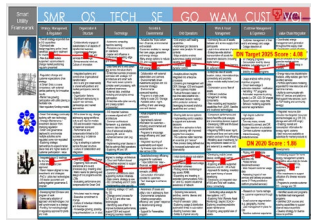
Energy Efficiency and Conservation Bill

- Passed in Dewan Rakyat and expected to be enacted by end of year 2023
- Provides for compulsory energy audits of larger commercial and industrial electricity and gas consumers
- Requires compliance by office buildings measuring 8,000 sq m and above



SMART GRID INDEX (SGI)

91% SGI by 2030



4.XX by 2030

MALAYSIAN SMART UTILITY 2030 MASTERPLAN

RP2 2018–2021 | RP3 2022–2024 | RP4 2025–2027 | RP5 2028–2030

ASSET MANAGEMENT

WORK MANAGEMENT

NETWORK OPERATOR

GRID

1.1 Single Source of Truth
- *Condition based maintenance for critical assets*
- *MV data visibility*

1.2 Digital Asset Management
- *Real Time Risk & Conditional Based Maintenance*
- *Remote Asset Monitoring*
- *New asset types configuration (DER, EV, CESS, VRDT etc.)*
- *LV & DER data Visibility*

1.3 Integrated Asset Investment
- *Integrated operations, maintenance & capital planning (Opex, Capex)*
- *Proactive Asset Management with flexibility.*
- *Advanced Spatial Analysis with Analytics*

1.4 Advanced Asset Analytics
- *Digital Twin Network Planning & Operations*
- *AI & Machine Learning assisted Analytics for Planning, Maintenance, NTL*

2.1 Digitized Work Planning & Execution
- *Digital journeys mapping for field users*
- *Digital workflow and field user experience mapping*
- *Crew assignment and field mobility enablement*

2.2 Work Automation
- *E2E digital workflow and field force enablement*
- *Automate Crew assignment and field mobility enablement*

2.2 Advanced Work Automation
- *Online connection, outage status & job status*
- *Extend digital work process to contractors/developers*

2.3 AI Assistance
- *Integrated WAM : Digital Twin Field Asset Inspection*
- *Priority IoT alert schedule*

3.1 Monitoring & Supervisory Control
- *Rapid fault detection and response.*
- *Enable real-time monitoring and control.*
- *Enhances power factor correction for efficient energy usage*

3.2 Advanced Network Monitoring & Control
- *Advanced Network modeling*
- *Smart equipment and automation*
- Integration of weather information
- *Outage management*
- *Grid cyber security strengthening*

3.3 Dynamic Operations
- *Optimal network configuration*
- *Automated proactive analysis*
- *Volt-Var Optimization*
- *Grid balancing*
- *Automated Voltage Regulation*

3.4 DER Control Management
- *Dynamic capacity conservation*
- *Demand Response Management*
- *Microgrid Management*

4.1 Fragmented DER Integration & monitoring
- *Distributed Generation*
- *Peak Management*
- *DER Generation Forecasting*
- *DER Assessment*

4.2 DER Connection Management
- *DER Registration*
- *Dynamic Hosting Capacity*
- *DER Impact forecasting*
- *DER Network planning*

4.3 DER Integration & Monitoring
- *DER Management with analytic capabilities*
- *Dynamic Hosting Capacity*
- *Load Balancing*
- *Distributed Storage*
- *Electric Vehicle Infra*

4.4 DER Aggregation Management
- *Flexible demand*
- *Integration of diverse DERs*

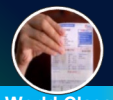
5.1 Smart Devices and New Products
- *Smart Metering & Energy Data Platform*
- *Introduction of new customer types – DER, Retail*

5.2 Connected Energy & Energy Usage Monitoring
- *Remote Energization/De-Energization*
- *Real time interactive customer service*
- *Omni-Channel Enablement*
- *Option for e-Tou*
- *Outage notification*

5.3 Digitized DN Contact Centre
- *Third party contract and access enablement*
- *Artificial Intelligence based customer and agent interaction*
- *Real-time interactive customer service*

5.4 Customer RE Optimization Services
- *Customer Demand/Supply Management*
- *Energy Trading enablement*

SMART UTILITY '30


World Class Experience


Affordability


Customer Empowerment

DN TARGET STATE CAPABILITIES
- Predictive Asset Management
- Smart & Connected Worker
- Self Healing Grid
- Flexible Energy Management
- Customer Empowerment

DN DATA MANAGEMENT

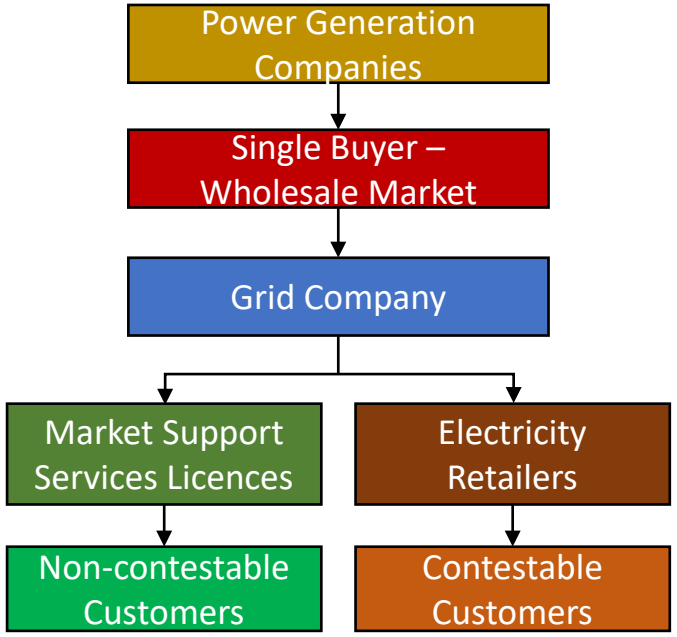
OPERATION | ENERGY MANAGEMENT | CUSTOMER MANAGEMENT

Facilitator of Energy Transition

Enable of Cust. Empowerment

SINGAPORE - Market Structure

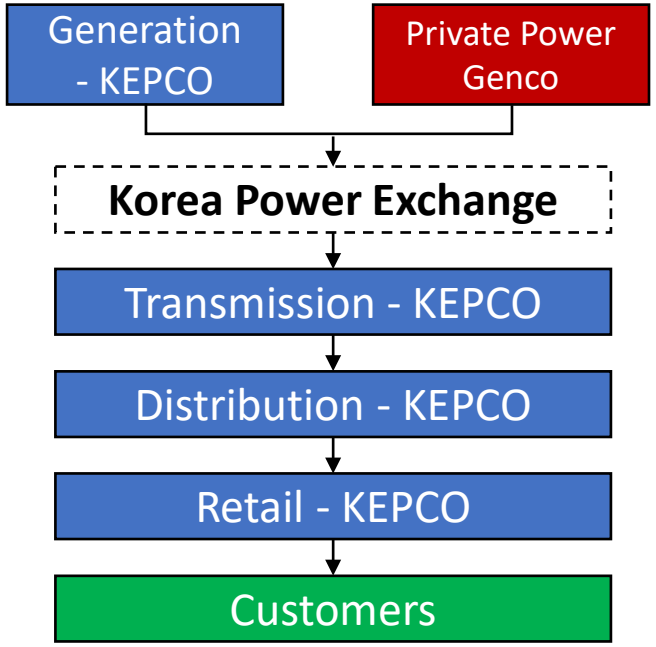
- In 1998, Singapore became the first country in Southeast Asia to introduce the wholesale electricity trading market.
- In April 2018, Singapore soft launched the Open Electricity Market to allow contestable customers to enjoy more choices.
- Non-contestable customers can still choose to remain with their electricity plans under regulated tariff rates.



Fully Liberalized Market

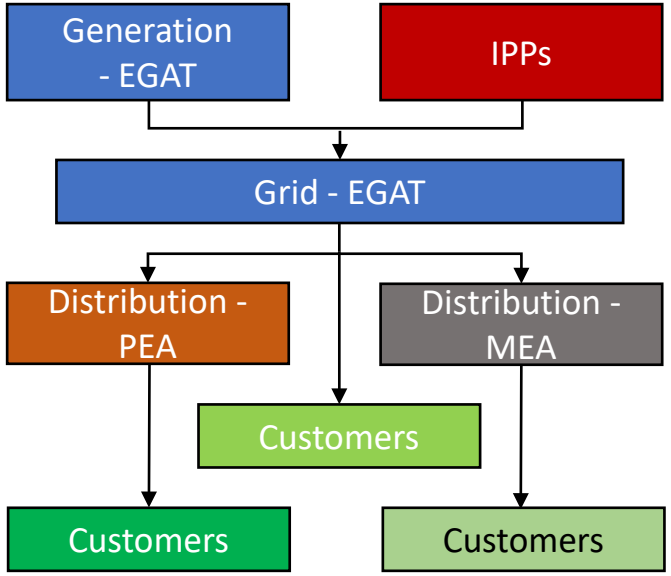
SOUTH KOREA - Market Structure

- South Korea's electricity structure has been monopolistic in nature through KEPCO.
- The generation sector has been opened to other private power-generation companies.
- The Korea Power Exchange acts as a wholesale market to facilitate grid generation.
- The transmission, distribution grid, and retail section are operated by KEPCO



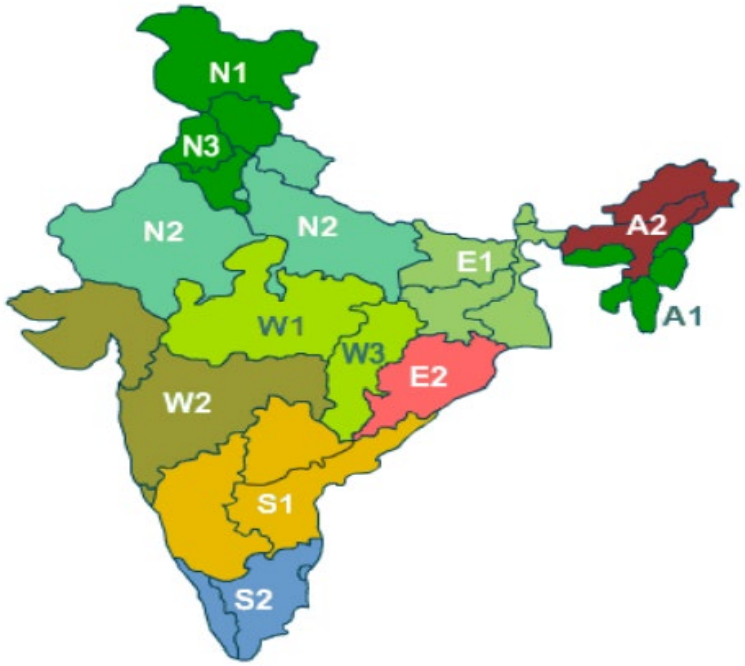
THAILAND - Market Structure

- Thailand adopted a single-buyer model in the power sector, under which state-owned utility allows limited private sector participation.
- EGAT owns and operates most of the country's power generation capacity and transmission networks.
- The Metropolitan Electricity Authority (MEA) and the Provincial Electricity Authority (PEA) distribute power to retail, commercial, and industrial consumers throughout Thailand.
- EGAT sells electricity to the MEA and PEA at a regulated rate set by the Energy Policy and Planning Office.



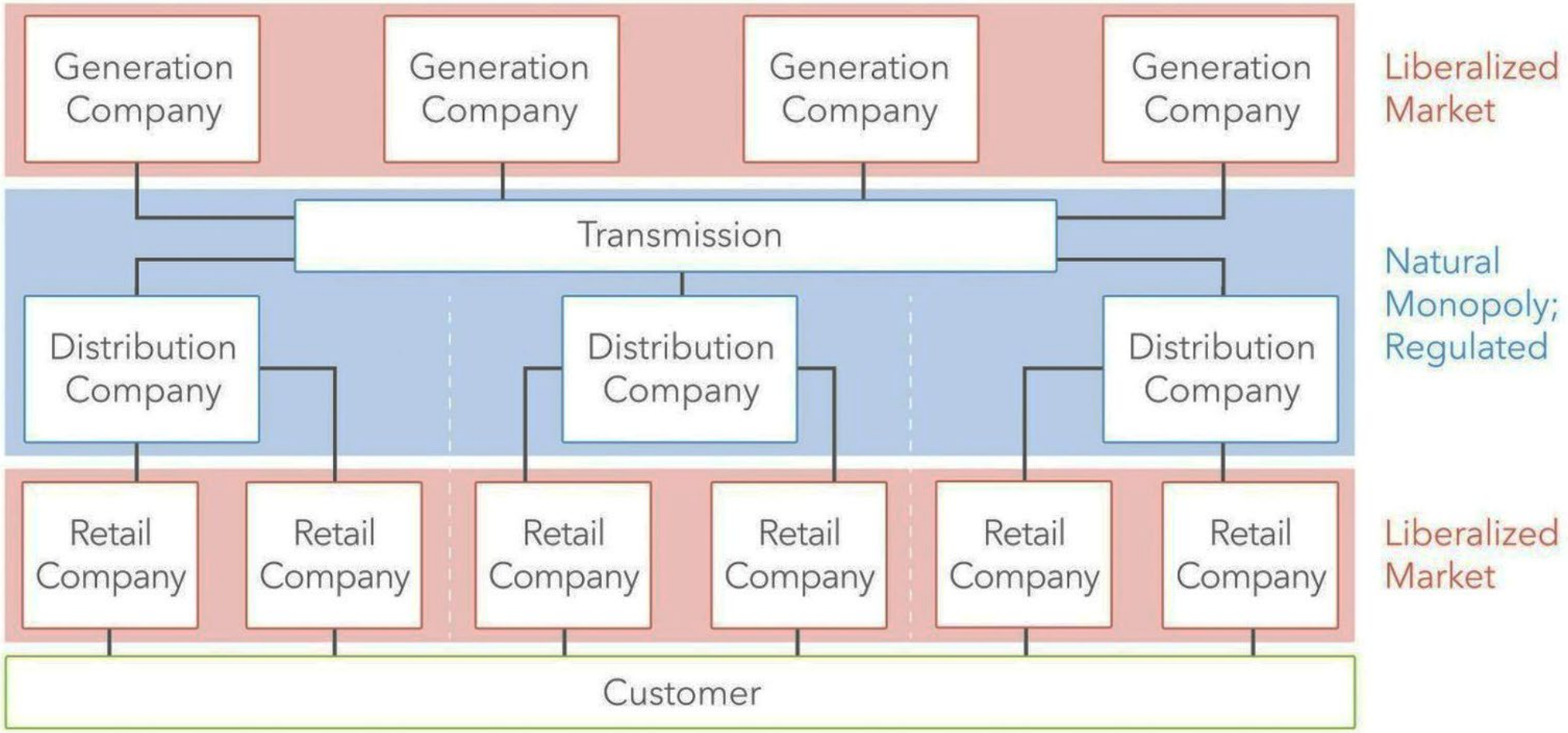
ELECTRICITY MARKET IN INDIA

- Electricity market is estimated to be 453 GW
- Electricity market: Transparent, competitive and efficient platform for power trading and transactions.
- Indian Electricity Act 2003: Frame-work for Indian electricity market operations.
- Exchanges in India started operations from 2008
- Availability of a large number of products: Day Ahead Market, Term Ahead Market, Real Time Market, Green Term-Ahead Market, Renewable Energy Certificate, Energy Saving Certificate
- Markets are driven by the force of economies: Demand-Supply balance and pricing.
- Pre-requisite: Unbundling of utilities, Multi-buyer model, System operator, Open access, Imbalance settlement mechanism, Trading, Autonomous regulator, Modern IT and communication platforms.



13 BID AREAS in India

UTILITY MARKET STRUCTURE



Liberalised Market

Utility Market Structure Benefits and Drawbacks

Market Structure	Benefits	Drawbacks
Vertically Integrated Market	• **Economies of Scale:** lead to cost savings that can be passed on to consumers. • **Stability**: have control over multiple aspects of the supply chain. • **Infrastructure Investment**: invest in long-term infrastructure projects for reliability and efficiency. • **Regulatory Oversight**: there is a single entity to regulate and ensure compliance	• **Reduced Competition**: can stifle competition leading to reduced innovation • **Monopoly Power**: wield significant market power and could engage in anti-competitive practices, harming consumers. • **Resistance to Change**: may not adapt quickly to evolving market conditions. • **Barriers to Entry**: more difficult for new and smaller players, which can limit innovation in the industry.
Managed Market	• **Regulatory Oversight:** government regulation ensure that utility maintain high service standards and reliability. • **Consumer Protection:** protect consumers from monopolistic practices and unfair service quality. • **Universal Access:** ensure services are accessible to all, including low-income and underserved communities. • **Stable Prices:** regulators can stabilize utility prices by implementing rate caps, controlling price fluctuations.	• **Bureaucracy:** regulatory process can be slow and bureaucratic, hindering innovation to rapidly changing market conditions • **Political Influence:** susceptible to political influence, leading to decisions that favour certain companies or interest groups. • **Lack of Competition:** in some cases, the managed market model may discourage competition. • **One-Size-Fits-All Approach:** Regulation may impose a uniform approach on diverse markets not considering regional needs.
Fully Liberalised Market	• **Competition:** encourages competition among providers, leading to lower prices and improved service quality. • **Consumer Choice:** provide a wider range of choices in utility providers, tailor services to consumers' needs. • **Resource Allocation:** allocate resources, directing investments toward areas of greater demand. • **Reduced Bureaucracy:** reduce the need for government bureaucracy and oversight	• **Inequity:** providers may focus on profitable markets, leaving out consumers in low-income and rural areas. • **Price Volatility:** Market-based prices can fluctuate, leading to unpredictable costs for consumers. • **Short-Term Focus:** Private providers may prioritize short-term profits over long-term investment in infrastructure. • **Regulatory Challenges:** Regulation can be complex, and government oversight may still be necessary to prevent abuse.

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Creating a sub-national electricity market in Nigeria: What do Donors/Development agencies want to see (a pragmatic approach for transition)

Engr Simeon Atakulu
Senior Energy Consultant (WB)

October 2023

BENEFITS AND CONCERNS

BENEFIT

- Deepening demand profile of states. Apart from creating new economic and industrial parks/clusters, they can partner with donor agencies and private investors in creating more electricity access to rural and semi-rural areas
- Speed up regulatory processes and resolution of regulatory disputes.
- States may become innovative in providing the right environment for private capital injection and ,more donor funding.
- Has the potential to spur higher economic growth and job creation especially for the rural/semi-rural areas.

CONCERNS

- Not all states' electricity markets will be ready in the short-medium term; a clear transition framework will be required with NERC
- How will states' integrated electricity policy relate to the national integrated electricity policy to avoid confusion, duplication and streamline economic and planned growth.
- Application of standards and codes for construction and operation; state standards vs national standards; which will apply? Eg, mini-grids, transmission network development (and integration, where necessary), power stations and distribution assets, etc.

What Do Donors/Development Agencies want to see (A pragmatic Approach for Transition).

- Donors/Development Agencies may have different approaches to guide their actions, but the following are key considerations to assess states' preparedness to attract support.
- A detailed roadmap for transition from national to sub-national electricity market and regulation, taking into consideration the concerns listed earlier, is developed and approved.
- This roadmap will include a detailed definition and strategy to translate from national to a sub-national electricity market, including market performance evaluation, reporting and corrective strategy to be adopted.
- The roadmap will be expected to also have a comprehensive demand profile study and analysis, including energy mix, electricity penetration requirement, infrastructure analysis and projection, as well as projected investment requirement(or guide) including human and other resource capacity requirements.

What Do Donors/Development Agencies want to see (A pragmatic Approach for Transition).

- The roadmap will then detail the timeline and procedures for the following:
- Electricity policy consultation committee in place; Electricity policy and strategic implementation plan completed and passed by the state; it will detail the public and stakeholder consultation requirements prior to approval.
- Draft Electricity Bill prepared, public consultation process concluded and Electricity Bill passed by the state assembly.
- Electricity market consultation and public opinion concluded; Institutional requirements agreed, market rules, procedures and operational guidelines completed; transition strategy to sub-national market and regulation in place.
- Electricity market and regulation developed by state regulator and operational.
- This will then adequately guide donors/development agencies in areas where support will be required.

Conclusion.

- States' participation in the electric power business is encouraging.
- But issues of concern enumerated earlier will need speedy considerations and thought through solutions proffered to avoid un-necessary and distracting issues in NESI.
- States' will need a comprehensive roadmap as discussed earlier to guide donor agencies support.
- The key driver for donors/development agencies in this transition is to maintain a balanced and sustainable electricity market delivering customer satisfaction through maintaining a beneficial inter-institutional relationships between states and with NERC to reduce regulatory risks in the Nigeria electricity market.

THANK YOU

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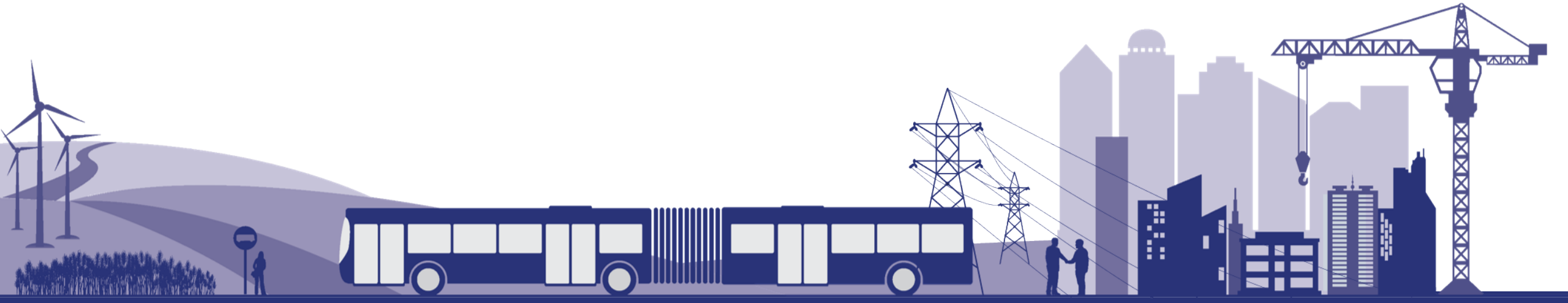
Closing the Energy Access Gap:
Doing things differently

October 2023

Presented by:

Frank Edozie



Sector Overview

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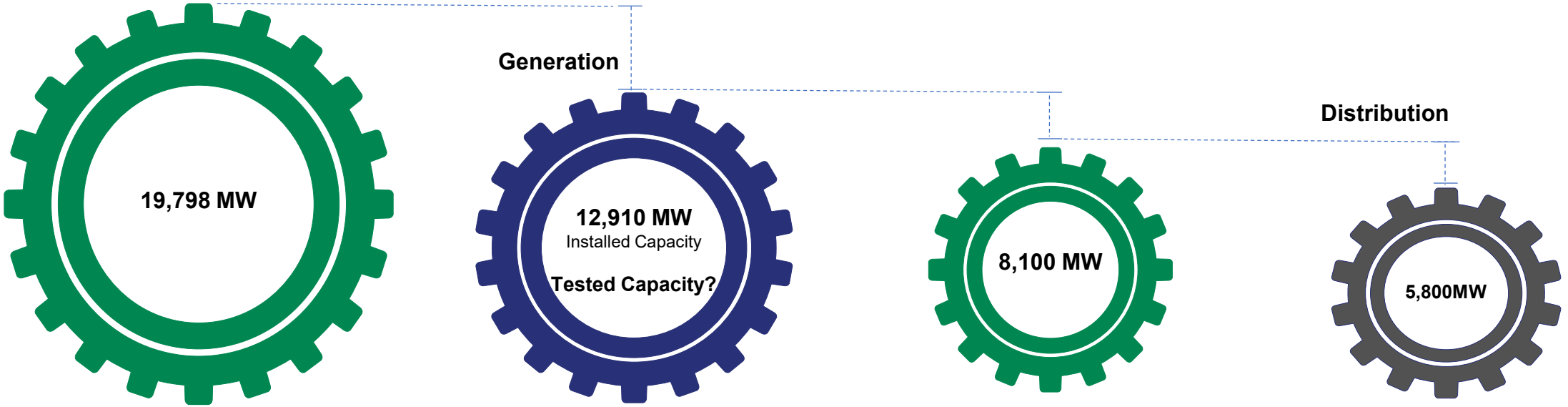
Power Value Chain – Constraints



Key Issues

- Ineffective Regulatory Environment
- Inefficient Transmission Grid
- Non-Cost-reflective Tariffs
- Low Value Chain Transparency
- Commercially Unsustainable and unconnected Mini-grids
- Climate-sensitive responses not part of top sector priorities despite policy shifts in this regard
- Low levels of Investments

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Doing Things Differently… What if….?

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- **New State Market Structures enabled investment inflow in the distribution space through…**
  - Energy Retail Licensees (ERLs) leveraging their capital to attract financing for PPAs with GenCos
  - Reduced Technical and Commercial losses, enabled by smart technology solutions pioneered by ERLs
  - State Governments collaborating with Low Voltage Transmission Companies to extend energy access and improve network resilience
  - Collaboration between State Governments and REA to accelerate the deployment and interconnection of mini-grids

- **A more viable distribution sub-sector inspires real growth in the transmission sub-sector through….**
  - The emergence of regional resilient ring circuits built to meet current and planned customer demand
  - Strengthening of the national grid
  - Potentially attracting interest in the development of a national super grid that will facilitate movement of large volumes of power across Nigeria's vast distances, and evacuation of power from large power plants (Solar, Hydro, Gas)

- **De-bottlenecked Distribution and Transmission sub-sectors spur growth in generation capacity:**
  - Growth in sub-national power generation driven by solar farms, small hydros, and thermal plants fired by Non-Associated Gas from Nigeria's Inland Basins
  - Large GenCos attract financing to invest in capacity growth (national and regional) consistent NDCs and the Energy Transition Plan

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A ROUNDTABLE ON
THE ELECTRICITY ACT 2023

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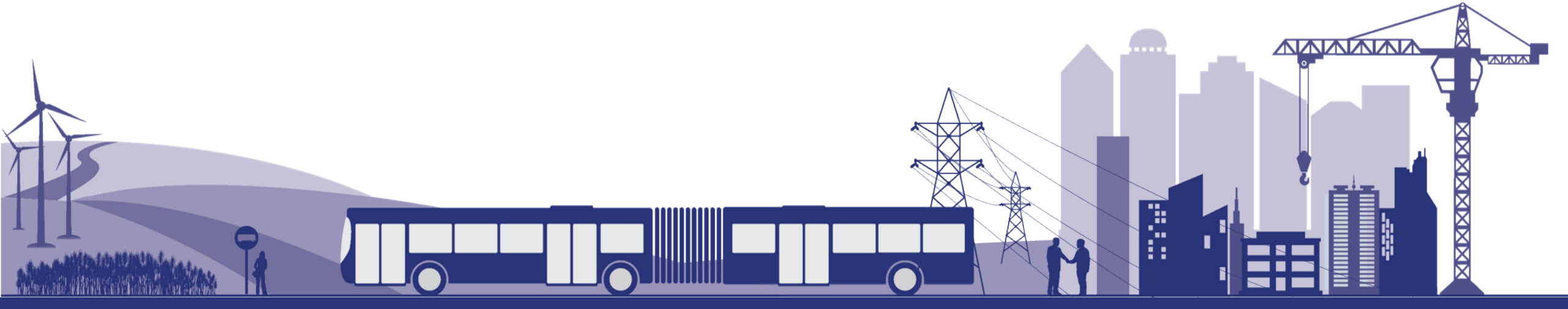
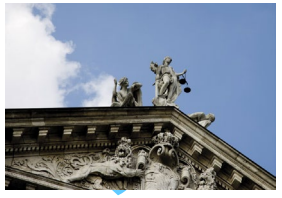
Key Regulatory Considerations for State Electricity Markets

Olajumoke Delano

October 2023





CONSTITUTIONAL AMENDMENT

State Houses of Assembly have the power within the state to make laws for generation, transmission & distribution

INTEGRATED RESOURCE PLANNING

A process of planning to meet users needs for electricity services in a way that satisfies multiple objectives for resource use.

Grid Expansion + Mini-grids + SHS

POLICIES

The set of ideas or plans that is used as a basis for making decisions.

LAWS

Strong fair laws that promote cohesion, local and foreign investments, federal and state collaboration.

SANCTITY & ENFORCEMENT OF CONTRACTS

Upholding existing contracts will give the sub-national governments credibility with future investors.

Adjudication of disputes

Building Blocks for a Viable State Electricity Market

AEDC PLC

Key Considerations

TARIFFS & PRICING

State Electricity Supply Industry Viability

Cost reflective tariffs

Attract investments

Subsidies

REGULATIONS

a. Licensing regime

b. Competitive market

c. Protect consumers

d. Issue Codes, Directives, Orders

e. Independence

PARTNERSHIPS

Mini-grids, Innovation

Investment in Electricity Value Chain and Networks,

Public Private Partnerships

Franchising Metering

STAKEHOLDER ENGAGEMENT & COLLABORATION

a. Multi-stakeholder sector

b. Build cohesion c. Disco Collaboration

d. Carry stakeholders along

MARKET COORDINATION & GOVERNANCE

a. Managing Overlaps

Policy + Law + Regulation+ Practice + Compliance + Enforcement

ENERGY ACCESS

Rural Electrification

Renewable Energy/ Climate Funding Opportunities

AEDC PLC

REGULATOR
REGULATION, COORDINATION, INDEPENDENCE,

REGULATOR
ENERGY ACCESS, EXISTING CONTRACTS, ENGAGEMENT

REGULATOR
GOVERNANCE, GENERATION OPPORTUNITIES

REGULATOR
UNIFICATION, COLLABORATION, PPPS, IRP

REGULATOR
LICENSING, LAWS

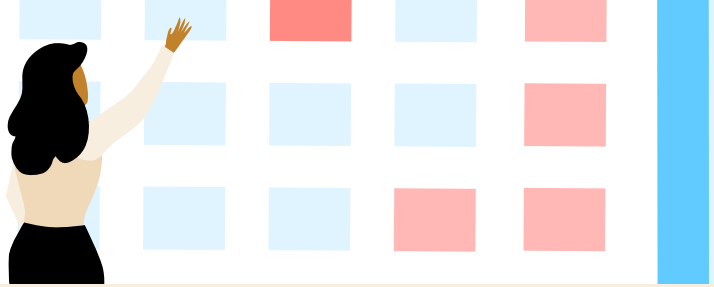
REGULATOR
ADJUDICATION OF DISPUTES

REGULATOR
TARIFFS, TRANSMISSION, TRAINING

REGULATOR
OVERLAPS, OPPORTUNITIES

REGULATOR
RENEWABLE ENERGY, RURAL ELECTRIFICATION

REGULATOR
DISCO COLLABORATION



ACRONYM

R-E-G-U-L-A-T-O-R

AEDC PLC

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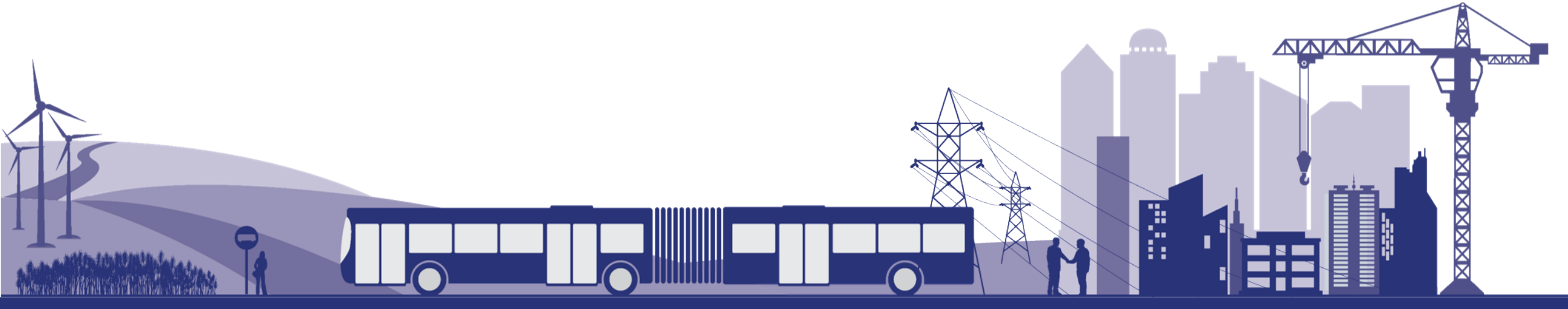
Closing the Energy Access Gap through Sub-national electricity markets: Doing things differently

Louisa Okeke

October 2023



The Enugu State Electricity Market

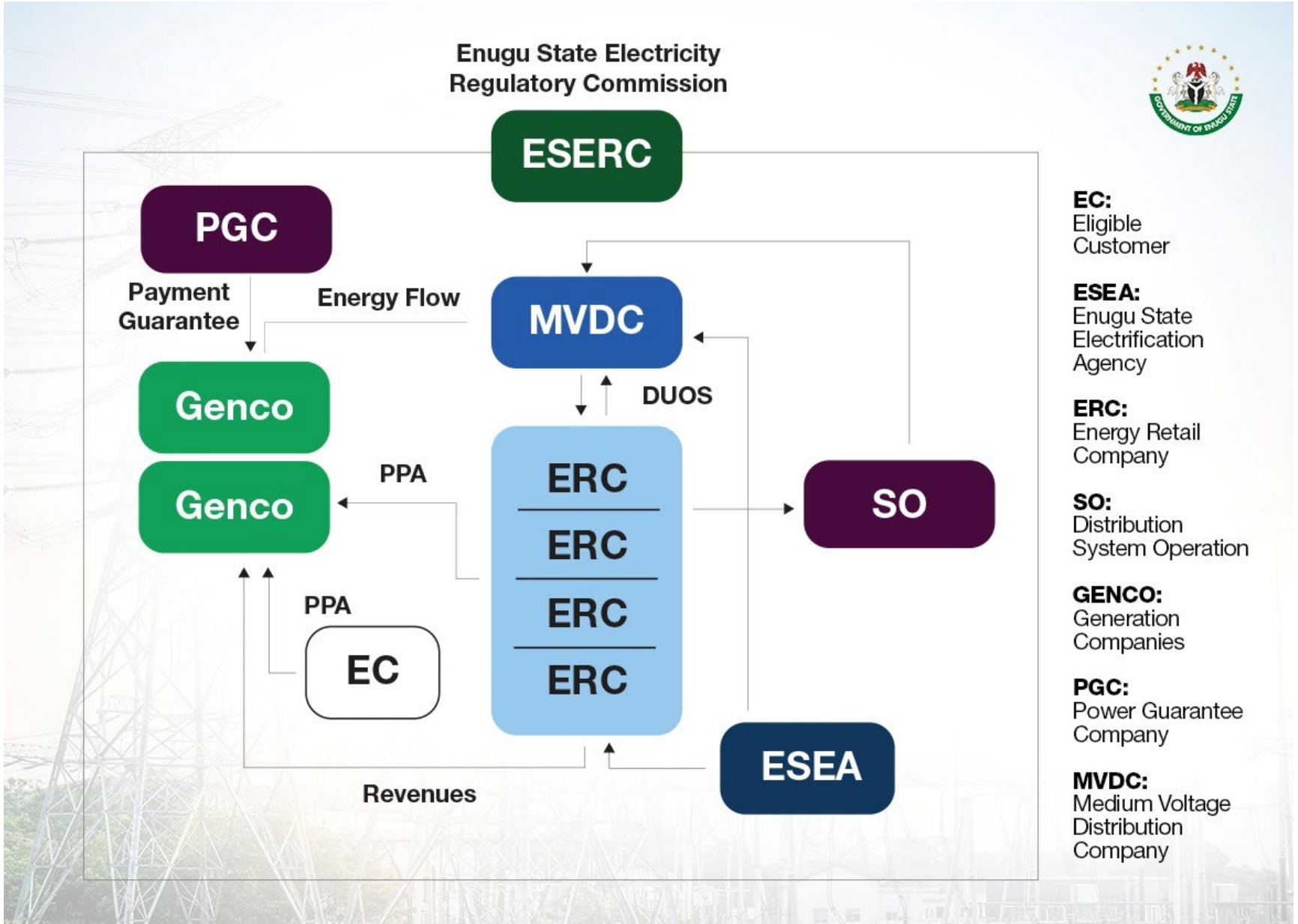
Previous

- Only 1 disco serving the region with approximately 9% allocation from the grid, serving about 5m people.
- No operating grid-connected generation assets.
- Shortage in quantity and quality of electricity supply.

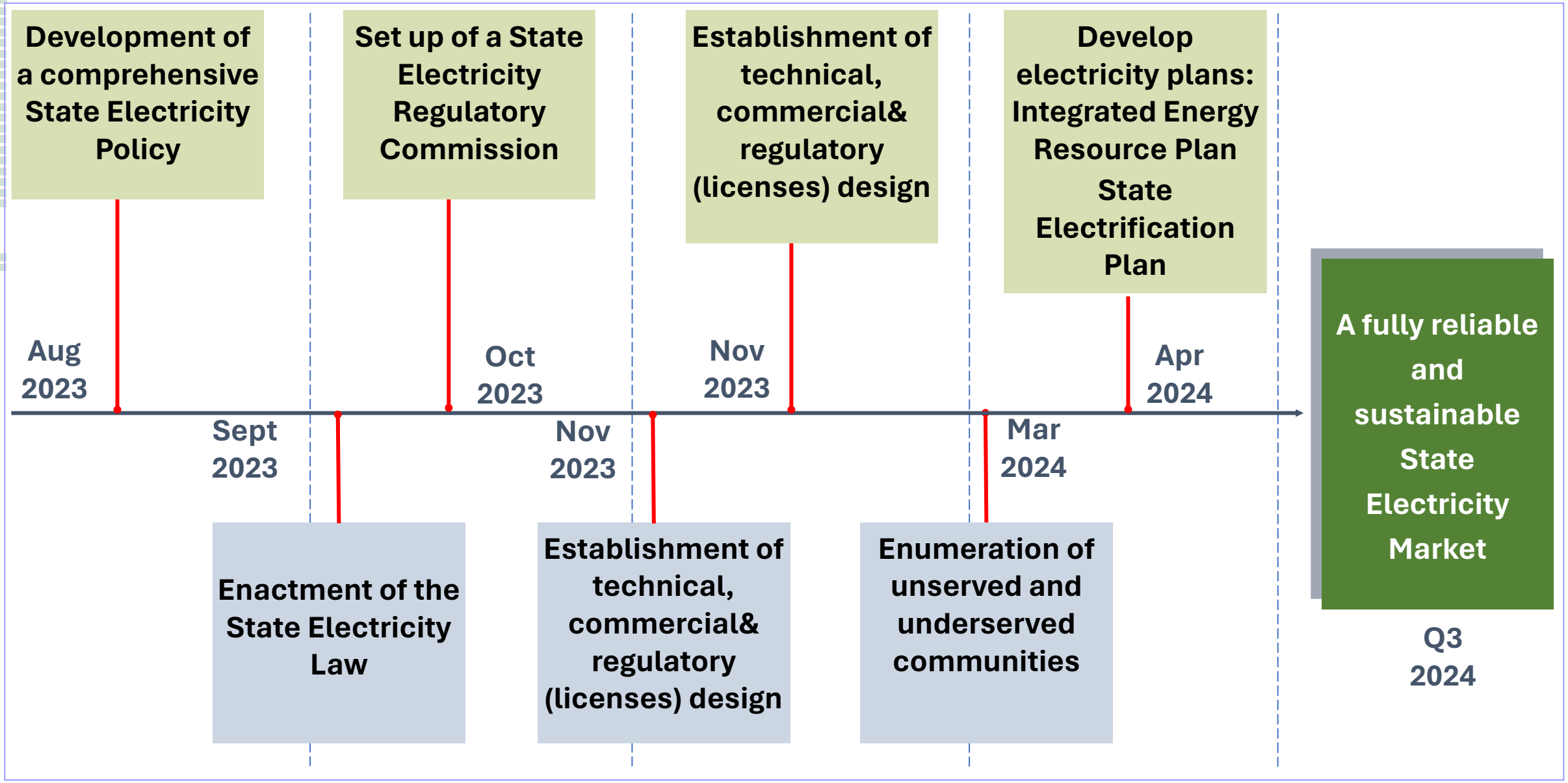
"To Be"

- 690+MW generation by 2030 for at least 20hours daily.
- 20% generation from renewables.
- Several market participants.
- Commercially viable market regulated by an autonomous Commission and integrated with the wholesale electricity market.
- Inclusion of unserved & underserved areas.

The vision for a commercially viable and sustainable Electricity Market...



The journey so far...



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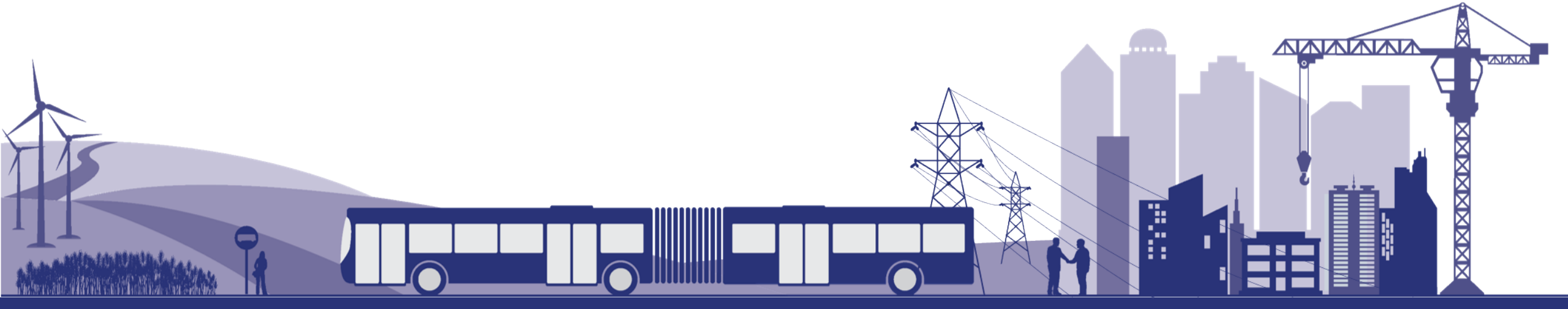
Investment Opportunities & Key Considerations for Attracting Investors in sub-national electricity markets

Odion Omonfoman

October 2023



1.0. The New Electricity Landscape

Constitutionally, State Legislature can make electricity laws for their states.. and for electricity generation, transmission & distribution within areas (already) covered by the national grid!

National Assembly Laws:

- Generation ✓
- Transmission ✓
- Electricity Distribution* (Intra-State) ✗
- Electricity Distribution (Inter State) ✓
- National Electricity Regulations ✓

State House of Assembly Laws:

- Generation (Intra State) ✓
- Transmission (Intra State) ✓
- Distribution (Intra State) ✓
- Inter-State Electricity Distribution ✗
- Electricity Regulations (Intra State) ✓

* The constitutional amendment and the assent of the Electricity Act 2023 creates a legal framework for the design and implementation of a holistic national electricity market and independent sub-national electricity markets

Recap: The Electricity Act 2023 expressly recognizes the rights of States to participate in the electricity sector under laws passed by SHoA…with significant social and economic benefits to States

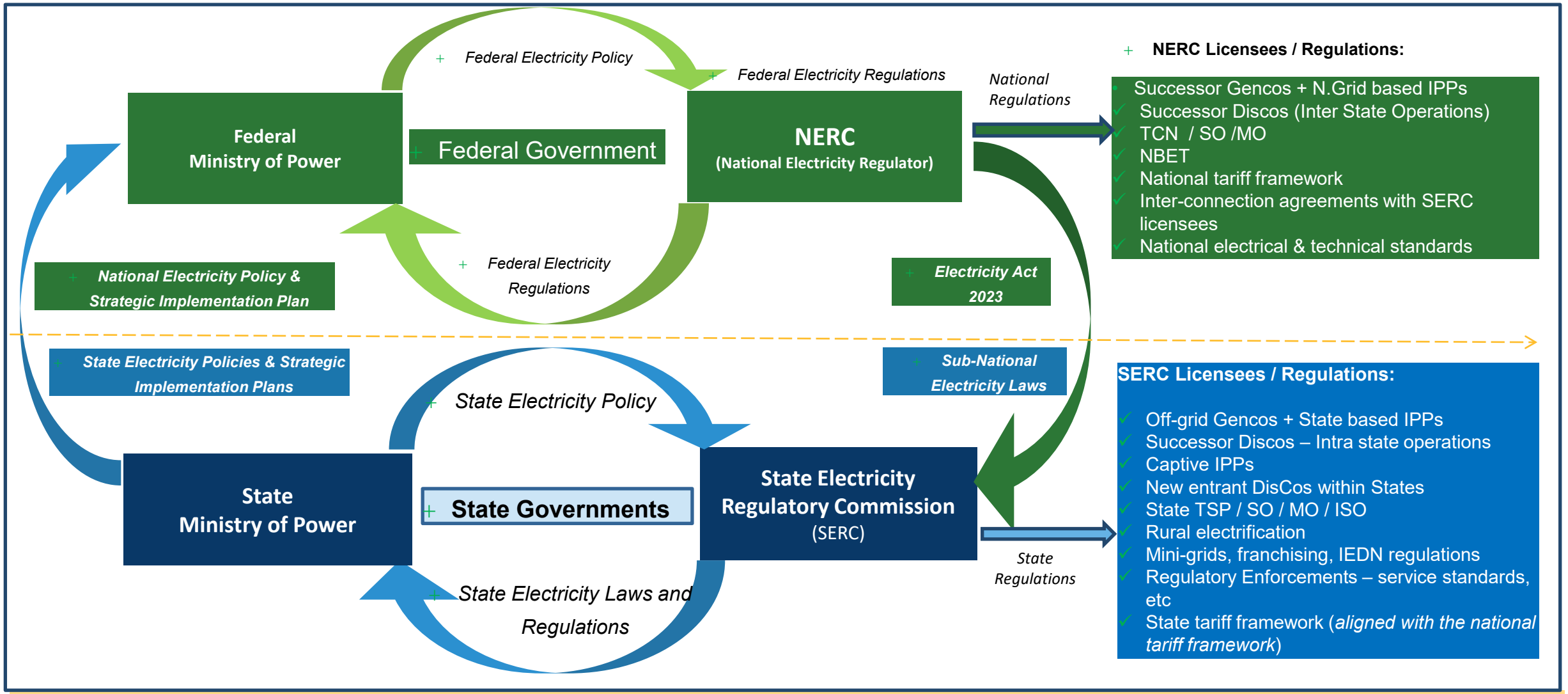
The Electricity Act 2023 expressly recognizes:

1. The right of States Houses of Assembly to make laws for all segments of the electricity sector within their states borders, without any limitations, including electricity distribution within “areas covered by a national grid system”.
2. The right for States to create under state laws, independent electricity regulatory structures within states i.e. set up State Electricity Regulatory Commissions (SERC) and their functions.
3. Right of States to license and operate their own electricity market structures for the generation, transmission, distribution and sale of electricity within their borders:
    i. Right to license state owned or private IPPs operating within the state without any capping of generation capacity that can be licensed by SERCs.
    ii. Right to license, own, operate and manage transmission infrastructure within the state.
    iii. Right to license, own, operate and manage any electricity distribution system
    iv. Right to set wholesale and retail electricity tariffs for state licensed entities operating within state electricity markets.
4. The delineation of the roles and functions of NERC and that of the SERC to ensure synergy and collaboration.
5. Rural electrification

1. Attract Local and Foreign Direct Investment into State economies – gas infrastructure, generation, transmission, transformers, renewable energy, mini-grid infrastructure, metering, etc
2. Increase access to electricity for more Nigerians who are underserved or unserved
3. More Market Competition - Further decentralization and unbundling of the power sector and enablement of market competition at the distribution sub-sector with the licensing of new entrant electricity distribution utilities
4. Faster rural electrification across States – This will in turn improve economic output of many communities, reduce rural – urban migration and also reduce banditry and other crimes within states.
5. Promote industrialization and commerce within States
6. Improve and increase the internally generated revenues to State governments
7. One key step to achieve true federalism and devolution of power – States are effectively in control of their electricity resources for the benefits of their people

Electricity access is sine qua non for economic development!

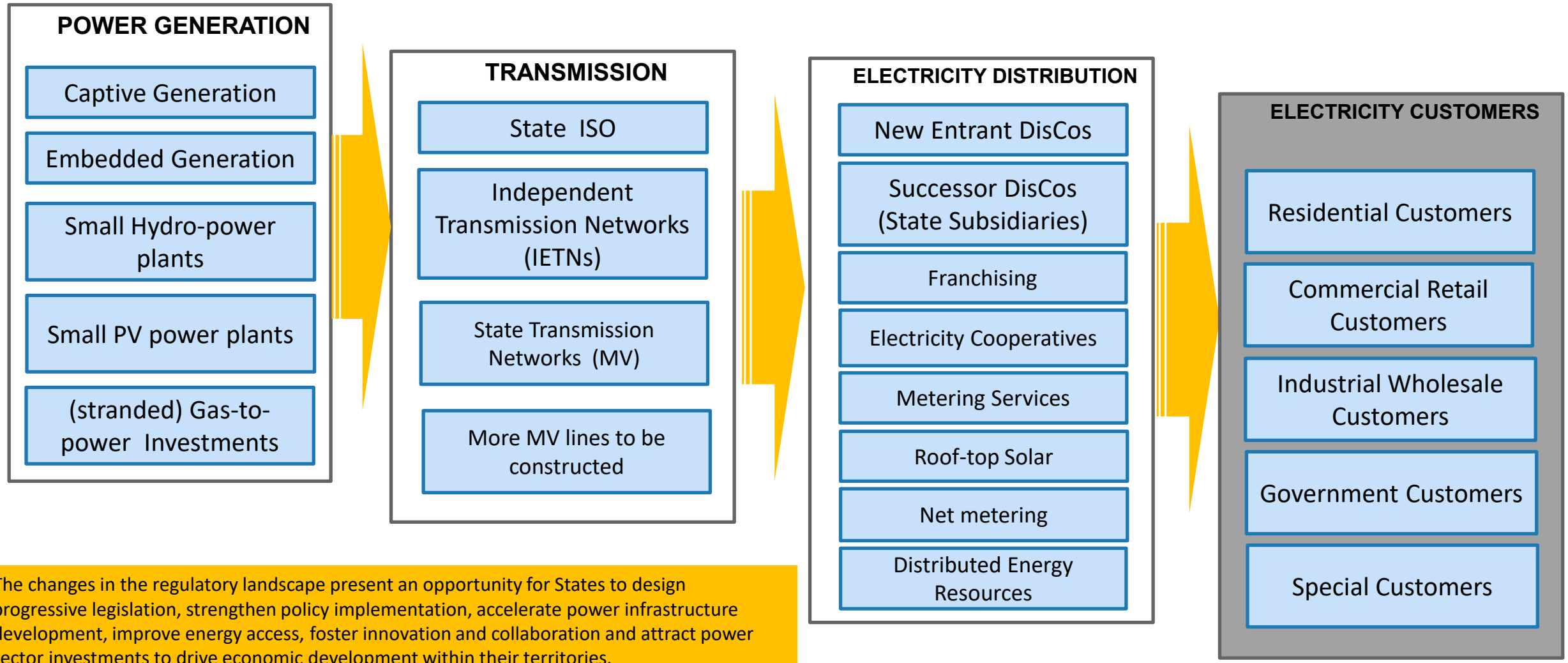
The Electricity Act 2023 enables a two-tier electricity market structure…A federal (wholesale) electricity market & sub-national electricity markets.



There needs to be policy, legal, and regulatory alignment between the Federal electricity market (essentially a wholesale market) and sub-national electricity markets to avoid market disruptions, mitigate legal and regulatory risks, as well as re-assure private sector investors and Development Partners in the NESI.

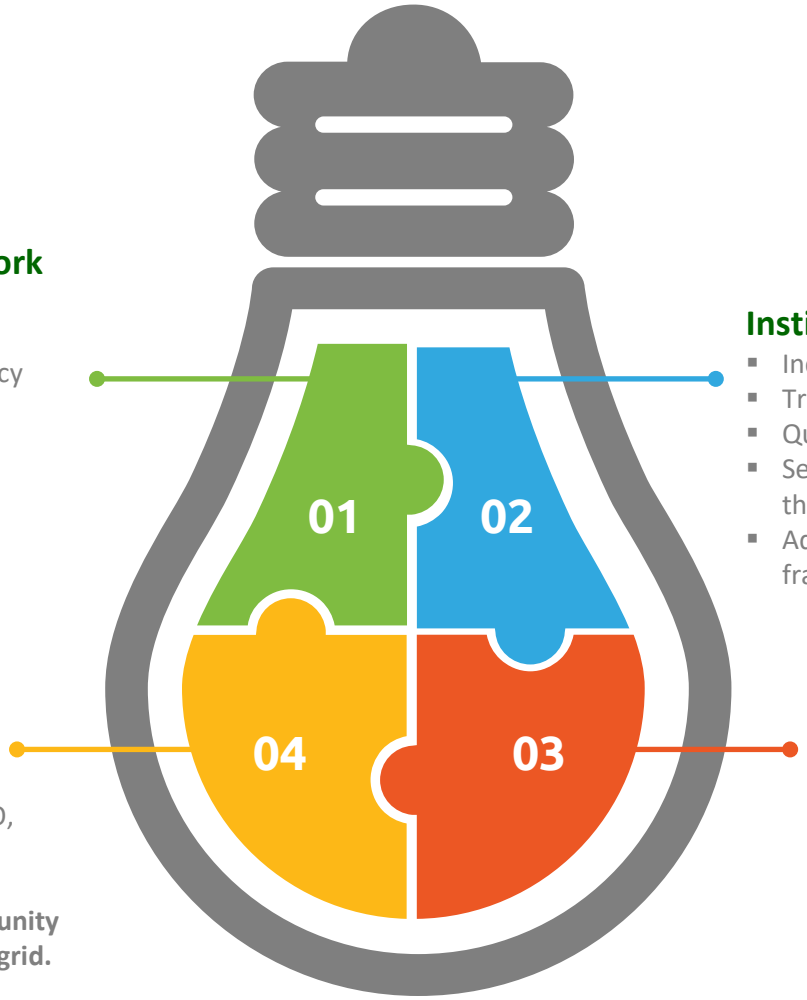
2.0. Investment Opportunities & Key Considerations

There are significant investment opportunities in sub-national electricity markets which cover both wholesale and retail electricity market value chains…



The changes in the regulatory landscape present an opportunity for States to design progressive legislation, strengthen policy implementation, accelerate power infrastructure development, improve energy access, foster innovation and collaboration and attract power sector investments to drive economic development within their territories.

Key considerations to attract investors in Nigeria's emerging sub-national electricity markets



Robust Electricity Policy & Legal Framework

- Develop policies and legal frameworks for state electricity markets
- Alignment of sub-national electricity laws and policy framework to federal laws and regulations
- Proper market designs aligned to State resources
- Impartiality and independence of State Judiciary system should not be overlooked

Institutional & Regulatory Framework/Structures

- Independent Regulatory Structures
- Trained and experienced Regulators
- Quality and depth of regulations and Orders
- Set up of other important state institutions in the sector with the right State Government (funding) support
- Adapt and/or adopt existing institutional and regulatory framework in the NESI

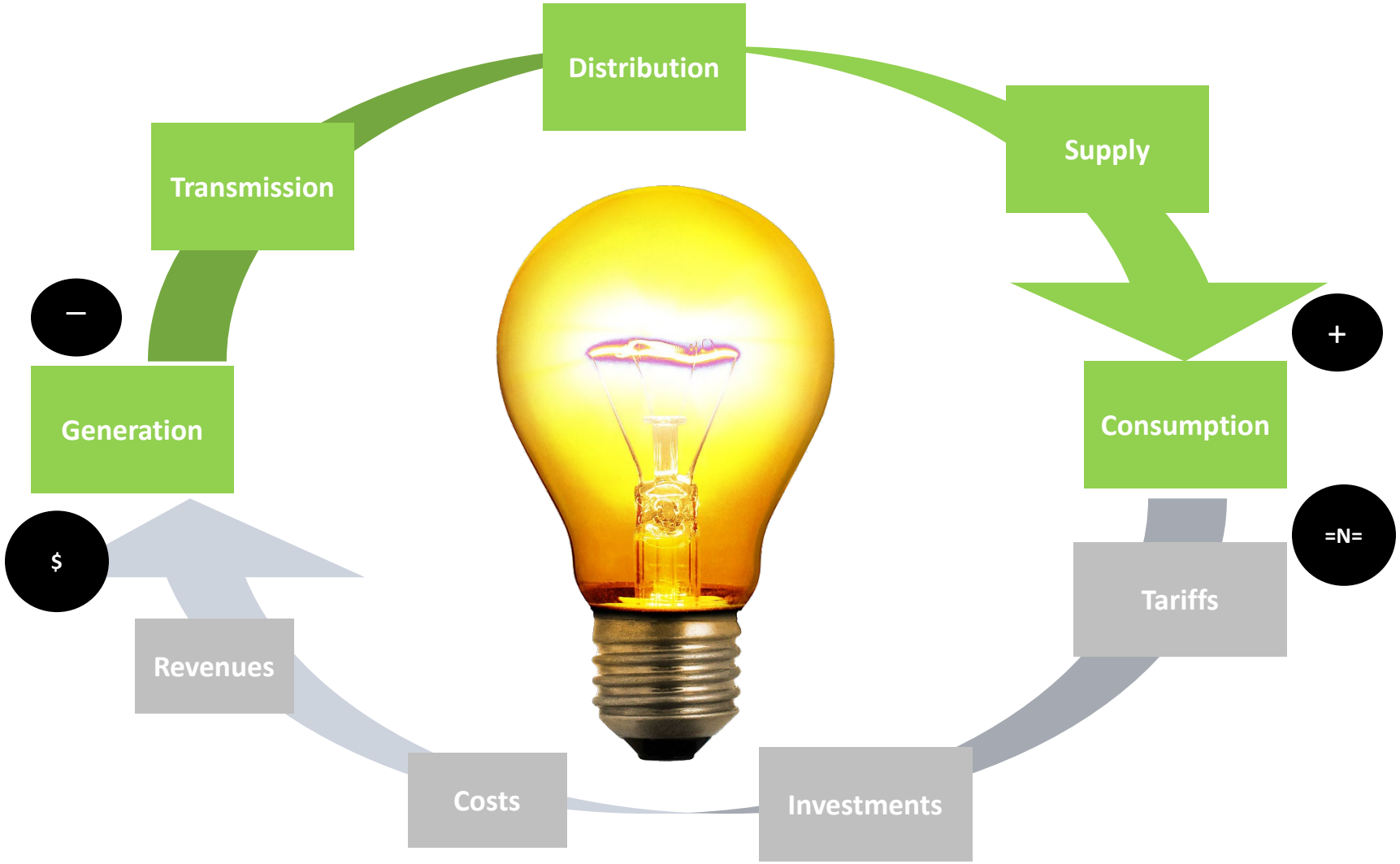
Strong Collaboration /Market Coordination between Federal & State Governments

- FMoP and State Ministries of Power (Policy)
- NERC and SERCs (Regulations)
- Collaboration with Market participants -REA, TCN / MO, NEMSA, etc
- Inter government Power Council
- **State electricity markets should be seen as an opportunity for extension of the grid and not a competitor to the grid.**
- Hence, the regulations around interface connections between State Licensees and the national grid should NOT create regulatory impediments to further extension of the national grid to states

Bankable Commercial Framework

- Development of Market rules, commercial contracts etc
- Competitive procurement processes for generation, transmission, distribution and rural electrification
- Financially sound market participants
- Adapt and adopt existing procurement processes in the NESI

Any Electricity Market is a circle, made up of two connected halves…. to have a continuous flow of electricity, a continuous flow investments and financing is required. States must make policies, laws and regulations that ensure the two halves are connected at all times.



States must be ready to manage the electricity policy and regulatory transition from the Federal Government and develop viable independent electricity markets within states that would attract both public and private sector investments.

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