# THE ENERGY TRANSITION: EXPECTATIONS AND REALITIES IN AFRICA

**Organised By**

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**Sub-theme 2:**

**Nigerian Electricity Distributors' Challenges and Human Capital**

**Speaker: Mr. Rotimi Adebari**

**6th June, 2023**

Association of Nigerian Electricity Distributors

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# Background

- Power Holding Company of Nigeria (PHCN), government-owned utility privatized on November 1, 2013
- 11 DisCos, 6 GenCos and 1 TransCo
- DisCos – 60 percent private majority/40 percent government
- Performance Agreements with specified performance targets were the basis of sale
- Nigeria has 16,384 MW of installed electricity generation capacity, however, only about 4,000 MW is distributed, with a supply gap of ~12,384 MW against Nigeria's potential demand of about 16,300 MW*

*Power Africa Fact Sheet

# DisCo Challenges

# DisCo Challenges

- Lack of Access to Capital
- Inadequate Metering
- Misalignment of Technical and Commercial Elements of the Electricity Value Chain
- No access to grants for embedded renewable system integration
- Revenue Shortfall/Inefficient Billing and Collection Systems
- Misalignment of DisCo Actual ATC&C Losses and Multi-year Tariff Order

# DisCo Challenges – Cont.

- Electricity Theft and Electricity Infrastructure Vandalism
- Gas/Generation/Transmission Constraint
- Distribution Electricity Franchise Encroachment
- Inconsistent Regulatory and Policy Environment
- Customers' Apathy to Meeting Energy Consumption Obligations or Bills

# Current Status



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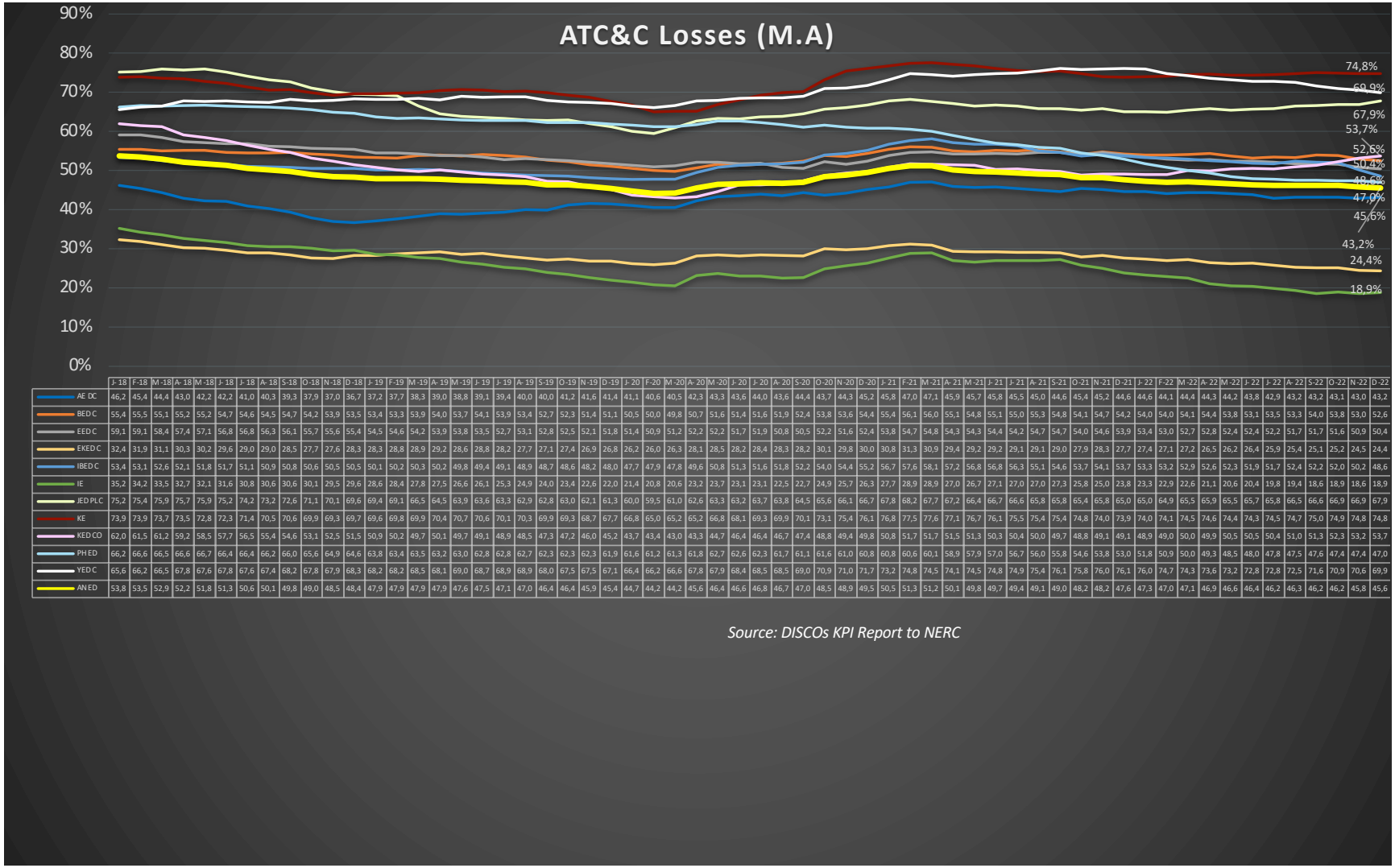


| | J-18 | F-18 | M-18 | A-18 | M-18 | J-18 | J-18 | A-18 | S-18 | O-18 | N-18 | D-18 | J-19 | F-19 | M-19 | A-19 | M-19 | J-19 | J-19 | A-19 | S-19 | O-19 | N-19 | D-19 | J-20 | F-20 | M-20 | A-20 | M-20 | J-20 | J-20 | A-20 | S-20 | O-20 | N-20 | D-20 | J-21 | F-21 | M-21 | A-21 | M-21 | J-21 | J-21 | A-21 | S-21 | O-21 | N-21 | D-21 | J-22 | F-22 | M-22 | A-22 | M-22 | J-22 | J-22 | A-22 | S-22 | O-22 | N-22 | D-22 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| AE DC | 46,2 | 45,4 | 44,4 | 43,0 | 42,2 | 42,2 | 41,0 | 40,3 | 39,3 | 37,9 | 37,0 | 36,7 | 37,2 | 37,7 | 38,3 | 39,0 | 38,8 | 39,1 | 39,4 | 40,0 | 40,0 | 41,2 | 41,6 | 41,4 | 41,1 | 40,6 | 40,5 | 42,3 | 43,3 | 43,6 | 44,0 | 43,6 | 44,4 | 43,7 | 44,3 | 45,2 | 45,8 | 47,0 | 47,1 | 45,9 | 45,7 | 45,8 | 45,5 | 45,0 | 44,6 | 45,4 | 45,2 | 44,6 | 44,6 | 44,1 | 44,4 | 44,3 | 44,2 | 43,8 | 42,9 | 43,2 | 43,2 | 43,1 | 43,0 | 43,2 |
| BED C | 55,4 | 55,5 | 55,1 | 55,2 | 55,2 | 54,7 | 54,6 | 54,5 | 54,7 | 54,2 | 53,9 | 53,5 | 53,4 | 53,3 | 53,9 | 54,0 | 53,7 | 54,1 | 53,9 | 53,4 | 52,7 | 52,3 | 51,4 | 51,1 | 50,5 | 50,0 | 49,8 | 50,7 | 51,6 | 51,4 | 51,6 | 51,9 | 52,4 | 53,8 | 53,6 | 54,4 | 55,4 | 56,1 | 56,0 | 55,1 | 54,8 | 55,1 | 55,0 | 55,3 | 54,8 | 54,1 | 54,7 | 54,2 | 54,0 | 54,0 | 54,1 | 54,4 | 53,8 | 53,1 | 53,5 | 53,3 | 54,0 | 53,8 | 53,0 | 52,6 |
| EED C | 59,1 | 59,1 | 58,4 | 57,4 | 57,1 | 56,8 | 56,8 | 56,3 | 56,1 | 55,7 | 55,6 | 55,4 | 54,5 | 54,6 | 54,2 | 53,9 | 53,8 | 53,5 | 52,7 | 53,1 | 52,8 | 52,5 | 52,1 | 51,8 | 51,4 | 50,9 | 51,2 | 52,2 | 52,2 | 51,7 | 51,9 | 50,8 | 50,5 | 52,2 | 51,6 | 52,4 | 53,8 | 54,7 | 54,8 | 54,3 | 54,3 | 54,4 | 54,2 | 54,7 | 54,7 | 54,0 | 54,6 | 53,9 | 53,4 | 53,0 | 52,7 | 52,8 | 52,4 | 52,4 | 52,2 | 51,7 | 51,7 | 51,6 | 50,9 | 50,4 |
| EKED C | 32,4 | 31,9 | 31,1 | 30,3 | 30,2 | 29,6 | 29,0 | 29,0 | 28,5 | 27,7 | 27,6 | 28,3 | 28,3 | 28,8 | 28,9 | 29,2 | 28,6 | 28,8 | 28,2 | 27,7 | 27,1 | 27,4 | 26,9 | 26,8 | 26,2 | 26,0 | 26,3 | 28,1 | 28,5 | 28,2 | 28,4 | 28,3 | 28,2 | 30,1 | 29,8 | 30,0 | 30,8 | 31,3 | 30,9 | 29,4 | 29,2 | 29,2 | 29,1 | 29,1 | 29,0 | 27,9 | 28,3 | 27,7 | 27,4 | 27,1 | 27,2 | 26,5 | 26,2 | 26,4 | 25,9 | 25,4 | 25,1 | 25,2 | 24,5 | 24,4 |
| IBED C | 53,4 | 53,1 | 52,6 | 52,1 | 51,8 | 51,7 | 51,1 | 50,9 | 50,8 | 50,6 | 50,5 | 50,5 | 50,1 | 50,2 | 50,3 | 50,2 | 49,8 | 49,4 | 49,1 | 48,9 | 48,7 | 48,6 | 48,2 | 48,0 | 47,7 | 47,9 | 47,8 | 49,6 | 50,8 | 51,3 | 51,6 | 51,8 | 52,2 | 54,0 | 54,4 | 55,2 | 56,7 | 57,6 | 58,1 | 57,2 | 56,8 | 56,8 | 56,3 | 55,1 | 54,6 | 53,7 | 54,1 | 53,7 | 53,3 | 53,2 | 52,9 | 52,6 | 52,3 | 51,9 | 51,7 | 52,4 | 52,2 | 52,0 | 50,2 | 48,6 |
| IE | 35,2 | 34,2 | 33,5 | 32,7 | 32,1 | 31,6 | 30,8 | 30,6 | 30,6 | 30,1 | 29,5 | 29,6 | 28,6 | 28,4 | 27,8 | 27,5 | 26,6 | 26,1 | 25,3 | 24,9 | 24,0 | 23,4 | 22,6 | 22,0 | 21,4 | 20,8 | 20,6 | 23,2 | 23,7 | 23,1 | 23,1 | 22,5 | 22,7 | 24,9 | 25,7 | 26,3 | 27,7 | 28,9 | 28,9 | 27,0 | 26,7 | 27,1 | 27,0 | 27,0 | 27,3 | 25,8 | 25,0 | 23,8 | 23,3 | 22,9 | 22,6 | 21,1 | 20,6 | 20,4 | 19,8 | 19,4 | 18,6 | 18,9 | 18,6 | 18,9 |
| JED PLC | 75,2 | 75,4 | 75,9 | 75,7 | 75,9 | 75,2 | 74,2 | 73,2 | 72,6 | 71,1 | 70,1 | 69,6 | 69,4 | 69,1 | 66,5 | 64,5 | 63,9 | 63,6 | 63,3 | 62,9 | 62,8 | 63,0 | 62,1 | 61,3 | 60,0 | 59,5 | 61,0 | 62,6 | 63,3 | 63,2 | 63,7 | 63,8 | 64,5 | 65,6 | 66,1 | 66,7 | 67,8 | 68,2 | 67,7 | 67,2 | 66,4 | 66,7 | 66,6 | 65,8 | 65,8 | 65,4 | 65,8 | 65,0 | 65,0 | 64,9 | 65,5 | 65,9 | 65,5 | 65,7 | 65,8 | 66,5 | 66,6 | 66,9 | 66,9 | 67,9 |
| KE | 73,9 | 73,9 | 73,7 | 73,5 | 72,8 | 72,3 | 71,4 | 70,5 | 70,6 | 69,9 | 69,3 | 69,7 | 69,6 | 69,8 | 69,9 | 70,4 | 70,7 | 70,6 | 70,1 | 70,3 | 69,9 | 69,3 | 68,7 | 67,7 | 66,8 | 65,0 | 65,2 | 65,2 | 66,8 | 68,1 | 69,3 | 69,9 | 70,1 | 73,1 | 75,4 | 76,1 | 76,8 | 77,5 | 77,6 | 77,1 | 76,7 | 76,1 | 75,5 | 75,4 | 75,4 | 74,8 | 74,0 | 73,9 | 74,0 | 74,1 | 74,5 | 74,6 | 74,4 | 74,3 | 74,5 | 74,7 | 75,0 | 74,9 | 74,8 | 74,8 |
| KED CO | 62,0 | 61,5 | 61,2 | 59,2 | 58,5 | 57,7 | 56,5 | 55,4 | 54,6 | 53,1 | 52,5 | 51,5 | 50,9 | 50,2 | 49,7 | 50,1 | 49,7 | 49,1 | 48,9 | 48,5 | 47,3 | 47,2 | 46,0 | 45,2 | 43,7 | 43,4 | 43,0 | 43,3 | 44,7 | 46,4 | 46,4 | 46,7 | 47,4 | 48,8 | 49,4 | 49,8 | 50,8 | 51,7 | 51,7 | 51,5 | 51,3 | 50,3 | 50,4 | 50,0 | 49,7 | 48,8 | 49,1 | 49,1 | 48,9 | 49,0 | 50,0 | 49,9 | 50,5 | 50,5 | 50,4 | 51,0 | 51,3 | 52,3 | 53,2 | 53,7 |
| PH ED | 66,2 | 66,6 | 66,5 | 66,6 | 66,7 | 66,4 | 66,4 | 66,2 | 66,0 | 65,6 | 64,9 | 64,6 | 63,8 | 63,4 | 63,5 | 63,2 | 63,0 | 62,8 | 62,8 | 62,7 | 62,3 | 62,3 | 62,3 | 61,9 | 61,6 | 61,2 | 61,3 | 61,8 | 62,7 | 62,6 | 62,3 | 61,7 | 61,1 | 61,6 | 61,0 | 60,8 | 60,8 | 60,6 | 60,1 | 58,9 | 57,9 | 57,0 | 56,7 | 56,0 | 55,8 | 54,6 | 53,8 | 53,0 | 51,8 | 50,9 | 50,0 | 49,3 | 48,5 | 48,0 | 47,8 | 47,5 | 47,6 | 47,4 | 47,4 | 47,0 |
| VED C | 65,6 | 66,2 | 66,5 | 67,8 | 67,6 | 67,8 | 67,6 | 67,4 | 68,2 | 67,8 | 67,9 | 68,3 | 68,2 | 68,2 | 68,5 | 68,1 | 69,0 | 68,7 | 68,9 | 68,9 | 68,0 | 67,5 | 67,5 | 67,1 | 66,4 | 66,2 | 66,6 | 67,8 | 67,9 | 68,4 | 68,5 | 68,5 | 69,0 | 70,9 | 71,0 | 71,7 | 73,2 | 74,8 | 74,5 | 74,1 | 74,5 | 74,8 | 74,9 | 75,4 | 76,1 | 75,8 | 76,0 | 76,1 | 76,0 | 74,7 | 74,3 | 73,6 | 73,2 | 72,8 | 72,8 | 72,5 | 71,6 | 70,9 | 70,6 | 69,9 |
| AN ED | 53,8 | 53,5 | 52,9 | 52,2 | 51,8 | 51,3 | 50,6 | 50,1 | 49,8 | 49,0 | 48,5 | 48,4 | 47,9 | 47,9 | 47,9 | 47,9 | 47,6 | 47,5 | 47,1 | 47,0 | 46,4 | 46,4 | 45,9 | 45,4 | 44,7 | 44,2 | 44,2 | 45,6 | 46,4 | 46,6 | 46,8 | 46,7 | 47,0 | 48,5 | 48,9 | 49,5 | 50,5 | 51,3 | 51,2 | 50,1 | 49,8 | 49,7 | 49,4 | 49,1 | 49,0 | 48,2 | 48,2 | 47,6 | 47,3 | 47,0 | 47,1 | 46,9 | 46,6 | 46,4 | 46,2 | 46,3 | 46,2 | 46,2 | 45,8 | 45,6 |

*Source: DISCOs KPI Report to NERC*

At the end of 2022, 8 DisCos have been able to return to the path of improvement in their ATC&C loss indicators and, remarkably, Ikeja Electric has achieved a new record below 20% by the end of 2022



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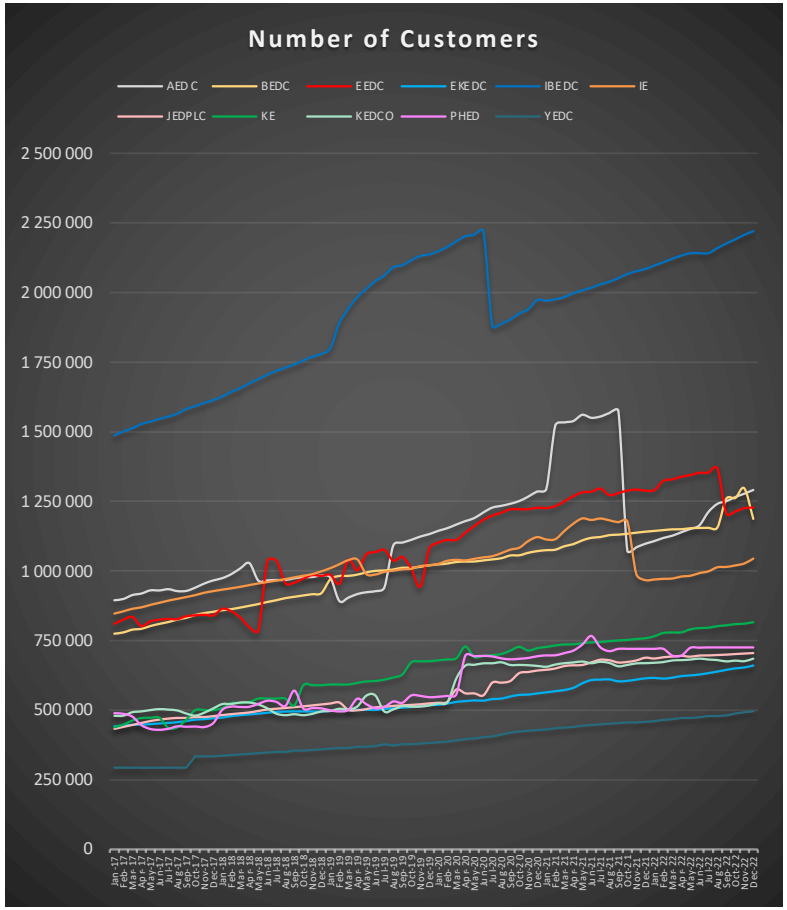


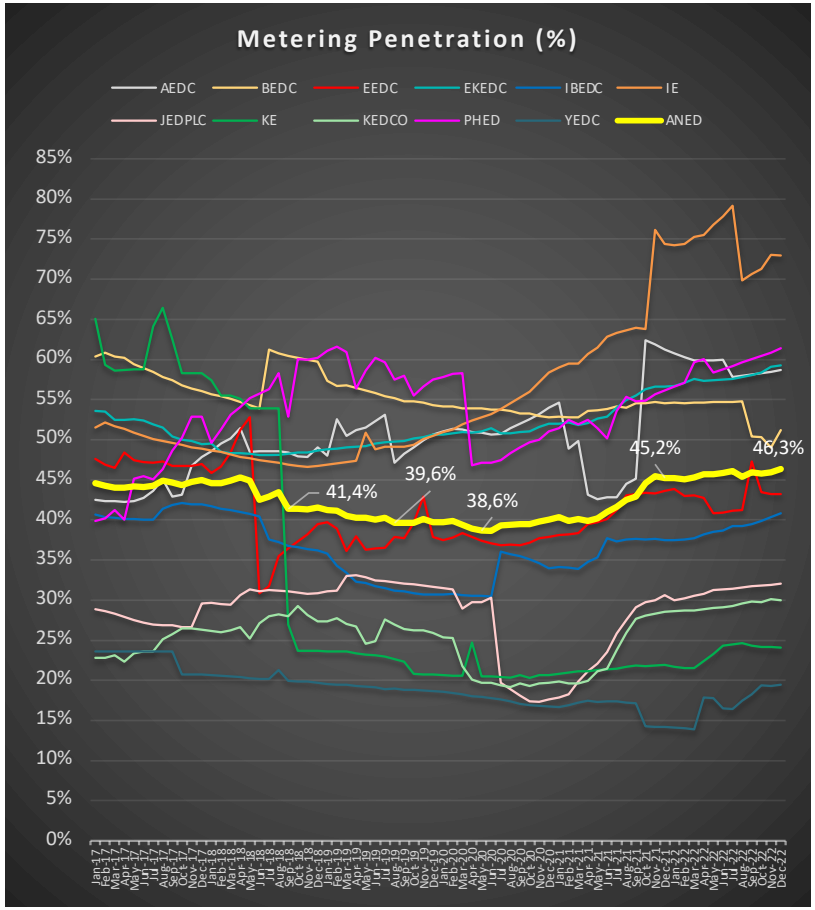


At the end of 2022, NESI accounted for over 11 million customers and the metering penetration continues to slightly increase, resulting in a slight change from the end of last year (+1.1% increase) which requiring significant investment in metering.



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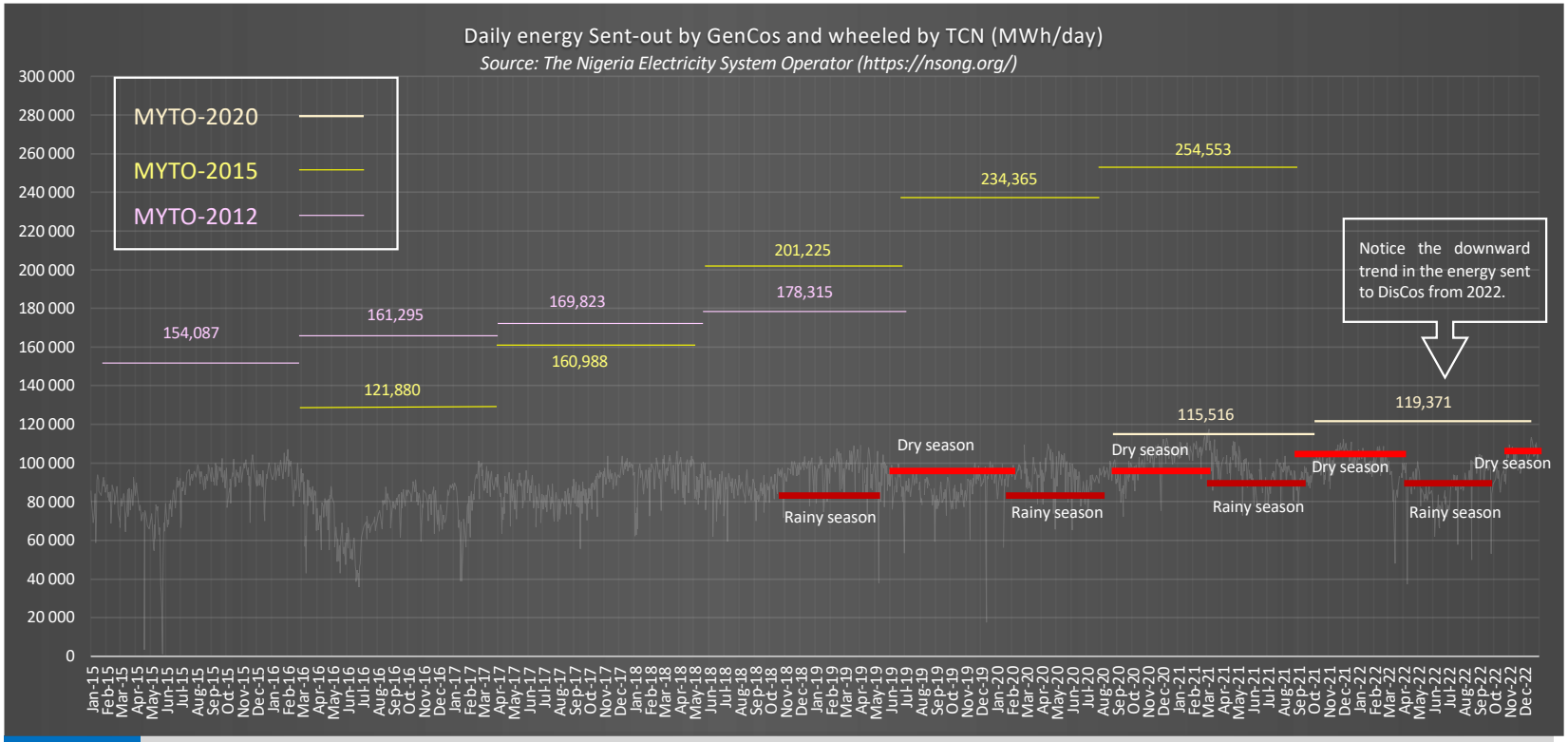
The daily energy sent-out by the GenCos and wheeled by TCN by the end of 2022, was on average 93,346.98 MWh (3,889.46 MW), which is a -5.9% decrease from 2021 (99,185.63 MWh; which was an average of 4,132.73 MW daily).




... under MYTO 2020, NERC projected that the daily energy sent-out should be around 126,000 MWh/day, which is not feasible and is inconsistent with NESI´s historical power supply trend. This paradox artificially reduces the cost-reflective tariff creating a shortfall that increases NESI´s liquidity crisis.



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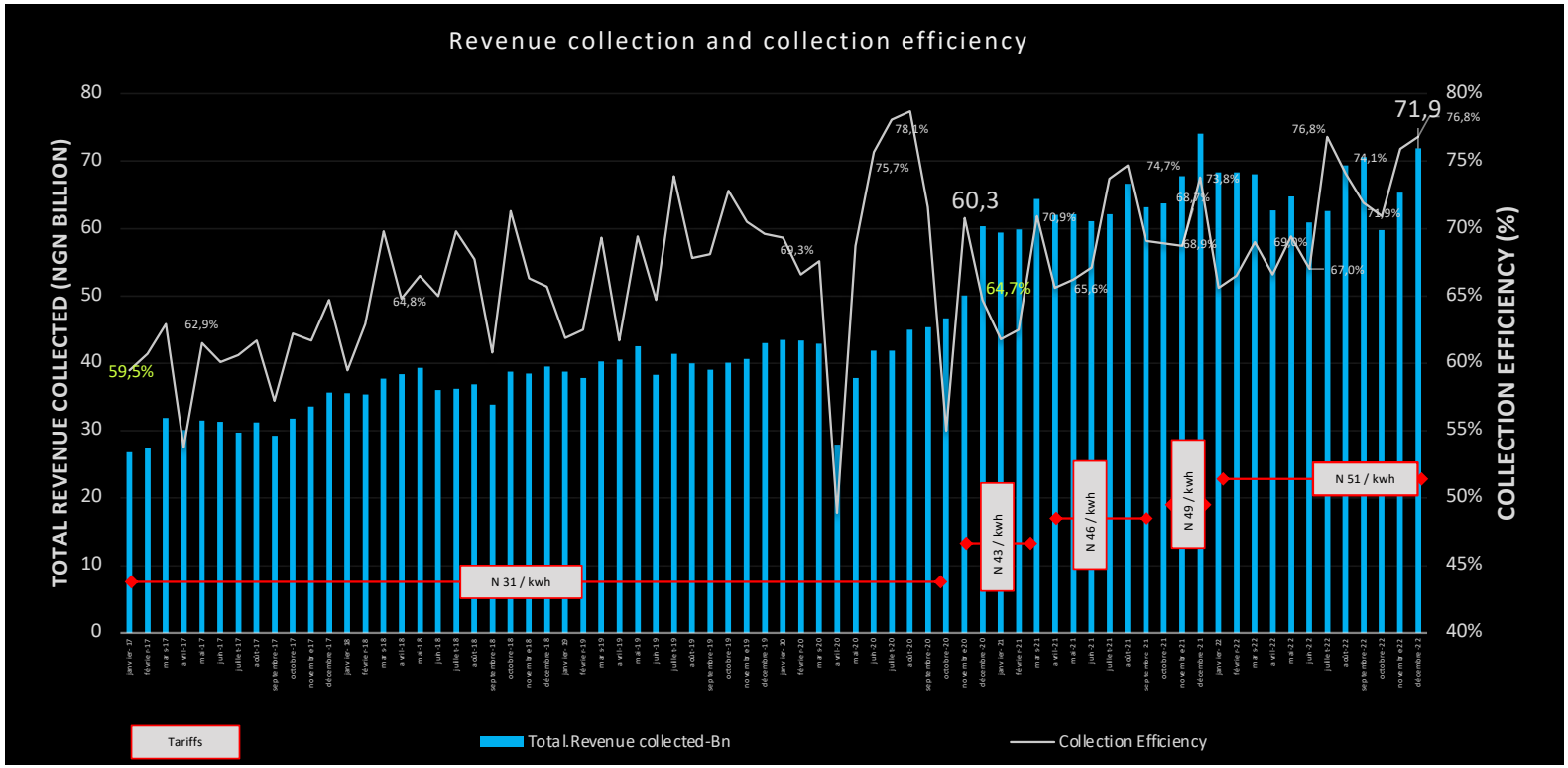
DisCos have withstood tariff increases well since November 2020 and have improved Collection Efficiency close to 71% on average, since then.




... in any case, there was a considerable increase in the Collection Efficiency the last quarter of 2022 from Q3.



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# Key Takeaways and Recommendations

# Key Takeaways and Recommendations

- Need for access to finance
- Implementing cost-reflective tariffs that adequately cover the costs of electricity distribution and encourage revenue generation, allowing for sustainability, productive and allocative efficiencies.
- Bilateral procurement of power by all DisCos
- Unbundling of the state-owned transmission company and independence of the System Operator
- Enhance and increase metering initiatives

# Key Takeaways and Recommendations – Cont.

- Strengthen efforts to reduce ATC&C losses through infrastructure upgrades, technology adoption, and measures to combat electricity theft.
- Improve billing and collection systems
- Encourage private sector participation and investment to boost funding for CAPEX and metering projects.
- Enhance regulatory oversight and enforcement to ensure compliance, financial discipline, and accountability within the power sector.

# DisCo Capacity Building - Issues and Needs

# Issues

- Aging workforce
- Not enough skilled/specialized personnel for the multiplicity of positions that exist across the DisCos
- Inadequate or insufficient funding available for capacity building and training due to DisCo liquidity challenges

# Capacity Building Needs

To determine DisCos' capacity building needs and issues, a Training Needs Assessment (TNA) was conducted in 2018.

| NOTABLE INFORMATION FROM TNA | FIGURE / % |
|---|---|
| Total Number of Staff in 10 DisCos | 21,755 |
| Staff in 14 Critical Job Roles | 20,333 |
| Energy Sales Representatives | 36% |
| Linesworkers | 21% |

# Capacity Building Needs – Cont.

## 14 Critical Job Roles

| Technical | Commercial | Support Services |
|---|---|---|
| **Linesworker** | Billing Officer | Legal & Regulatory |
| Cable Jointer | | Energy Management |
| Protection Control & Metering (PC&M) | Customer Service Officer | Health Safety & Environment Manager |
| Distribution Substation Officer (DSO) | Key Account Management Officer | Information Technology |
| Network Planner | **Energy Sales Rep** | Talent Management |
| Electrical Fitter | | |

# Capacity Building Needs – Cont.

## Key Areas Requiring Capacity Building

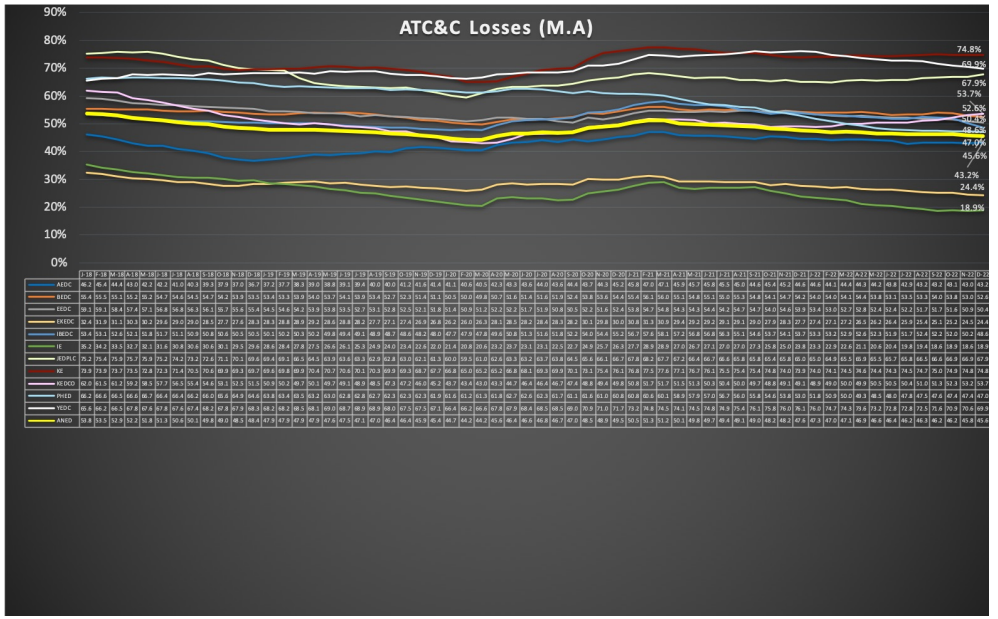
| S/N | TOPIC | TARGET PARTICIPANTS |
|---|---|---|
| 1 | Insight into best regulatory practice (tariff setting) African Countries | Regulatory |
| 2 | Managing Regulatory Risks in Utilities | Regulatory |
| 3 | Revenue Improvement Strategies | Commercial |
| 4 | How to reduce incidents of fatalities on our networks | HSE, Linesworkers |
| 4 | Energy control and fraud detection | Management, Commercial |
| 5 | Asset performance management | Management |
| 5 | Investors bankability and project financing | Investors, Management |
| 6 | Efficient loss reduction approach | Investors, Management |
| 7 | Advanced maintenance & application of modern software in network distribution operation | Technical |
| 8 | Technical loss identification | Technical |

# Key Takeaway and Recommendation

## Correlation Between Capacity Building and ATC&C Losses

| DISCO | NO. OF APPLICATIONS | SCHOLARSHIPS AWARDED |
|---|---|---|
| IKEJA | 79 | 79 |
| IBADAN | 64 | 64 |
| EKO | 50 | 50 |
| PHED | 40 | 40 |
| KANO | 24 | 24 |
| ENUGU | 24 | 24 |
| ABUJA | 13 | 13 |
| BENIN | 8 | 8 |
| **TOTAL** | **300** | **300** |

APUA/ANCEE Scholarship 2018/2019




Nigerian DisCos' ATC&C Losses (Jan 2018 – Dec 2022)

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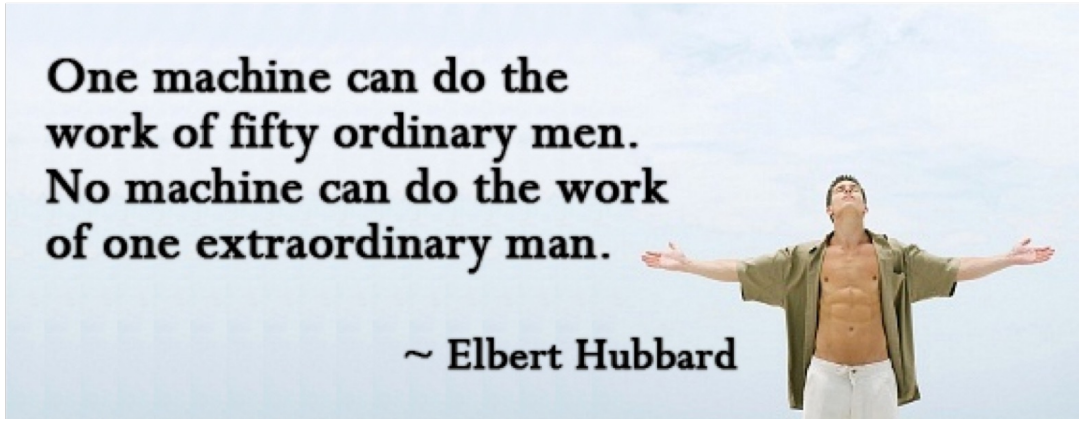


# THANK YOU

For queries email:
rotimi.adebari@anedng.com

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