

Clean Technology Hub
Energy Innovation Centre

Technical Brief

State Electricity Market Governance Readiness Index: Which Nigerian States are Ready to Govern their Electricity Markets?

September 2025.

Written by: Abel B.S. Gaiya, Ifeoma Malo and Kolade Kolawole

Background

The Federal Government of Nigeria (FGN) has spent over two decades attempting to overcome Nigeria's energy deficit by electrifying populations that lack electricity access and improving electricity supply to those connected to the national grid. About 39% of Nigerians lack access to electricity.[1] An additional 31 million live 'under the grid'—connected but receiving little to no power.[2] The national grid itself remains fragile, with 46 collapses recorded between 2017 and 2023. Despite billions of dollars poured into the sector by the government, and multiple reforms since 2005, the situation has not substantially improved.

The Electricity Act of 2023 represents a major shift by granting State governments authority over electricity generation, transmission, and distribution within their borders. This decentralization has been widely praised as an opportunity for States to take more responsibility for meeting their growing electricity demand.

However, there has been little systematic research on the readiness of State governments to undertake this role. Nigerian States differ significantly in geography, population size and density, terrain, technology options, fiscal capacity, institutional strength, and market conditions. Understanding how these factors shape a State's ability to govern its electricity market is critical for stakeholders ranging from power companies and investors to development partners and federal agencies.

Notable Points

- Nigeria's power sector struggles persist, with 39% lacking access, 31 million under-supplied, and frequent grid collapses despite decades of reforms.
- The Electricity Act 2023 decentralizes power, giving States control over generation, transmission, and distribution.
- State readiness to manage electricity varies greatly, with little research on their capacity to deliver.

[1] World Bank (2023). "Access to electricity (% of population) - Nigeria". https://data.worldbank.org/indicator/EG.ELC.ACCS.ZS?locations=NG.

[2] Ben Leo, Jared Kalow and Robert Morello (30 July 2015). "Living "Under the Grid" in Nigeria – New Estimates". Center for Global Development. https://www.cgdev.org/blog/living-under-grid-nigeria-new-estimates#:~:text=Top%2DLine%20Estimate%3A%20There%20could,%2C%20poorest%20or%20poorer%20categories).

Methodology

As an initial contribution to this evaluation, we developed an index, the "Clean Tech Hub State Electricity Market Readiness Index" (CTH-SEMGRI) to measure the readiness of each Nigerian State for electricity market governance. We measure State readiness for electricity market governance across four key metrics: fiscal capacity, quality of institutions, quality of business environment, and presence of enabling law.

The CTH-SEMGRI combines data from six sources, organized around four key areas, based on four key areas that potential electricity market players would likely be interested in when evaluating electricity governance readiness:



Fiscal Capacity: Measured by the State's annual electrification financing needs as a percentage of the most recent (2025) approved budget, multiplied by the public share of State electrification investment and the State government share of State electrification investment, minus 100.[3] This produces a measure of the extent to which a State has the fiscal space to pursue 100% electrification. In addition, the BudgIT 2024 Sustainability Ranking score is utilised as an indicator of the stability of a State's fiscal capacity.[4][5]



Quality of Institutions: Measured using the most recent (2022) figures for the Subnational Corruption Index (simple average for petty and grand corruption).[6] The index lies on a scale of 0 (most corrupt) to 100 (least corrupt), but has been normalized for the index to a scale of 0 to 1.



Quality of Business Environment: Measured by the World Bank's 2018 Subnational Ease of Doing Business Distance to Frontier (DTF) score for Nigerian States.[7] The DTF score is normalized to range from 0 to 100, with 100 representing the frontier of best practices (the higher the score, the better), but for the index normalized to a 0 to 1 range.

---

[3] The approved budget is Stated in naira within the source documents. This is converted to US dollars using a USD/NGN exchange rate of 1,500 (which is the exchange rate assumption made within the Federal Government's 2025 budget).

[4] BudgIT (2024). Sustainability Ranking. https://StateofStates.budgit.org/sustainability. Since the BudgIT 2024 Sustainability Ranking score is on a scale of 0-5, we standardise the scores by dividing by 5, to produce a score on a scale of 0 to 1. The sustainability ranking score measures State performance based on their level of dependence on federal revenue, growth in internally generated revenue, growth in internally generated revenue, availability of funds for capital expenditure, debt sustainability, and prioritization of capital expenditure over operating expenses.

[5] World Bank (2025). Global Electrification Platform. https://electrifynow.energydata.info/explore/ng-2. Two sources of data are used. The first is least-cost-electrification-based modeled estimates (based on default scenario values) for the investment costs of achieving 100% electrification by 2030 for each State, from the Global Electrification Platform. The second type of data is the approved annual budget for each State for the most recent year (2025), obtained from approved budgets available on BudgIT's Open States online platform. See Annex A for the formula used to calculate fiscal capacity.

[6] Crombach, Lamar and Smits, Jeroen (2024). The Subnational Corruption Database: Grand and petty corruption in 1,473 regions of 178 countries, 1995-2022. figshare. Collection. https://doi.org/10.6084/m9.figshare.c.7061534.v1. Grand corruption perceptions and petty experiences are obtained through surveys.

Presence of Enabling Law: Based on desk research identifying, through news reports and press releases, which States have successfully passed an electricity law (score = 1), have electricity bills in the State Assembly (score = 5) and have neither an electricity law nor a bill undergoing legislative reading (score = 0).

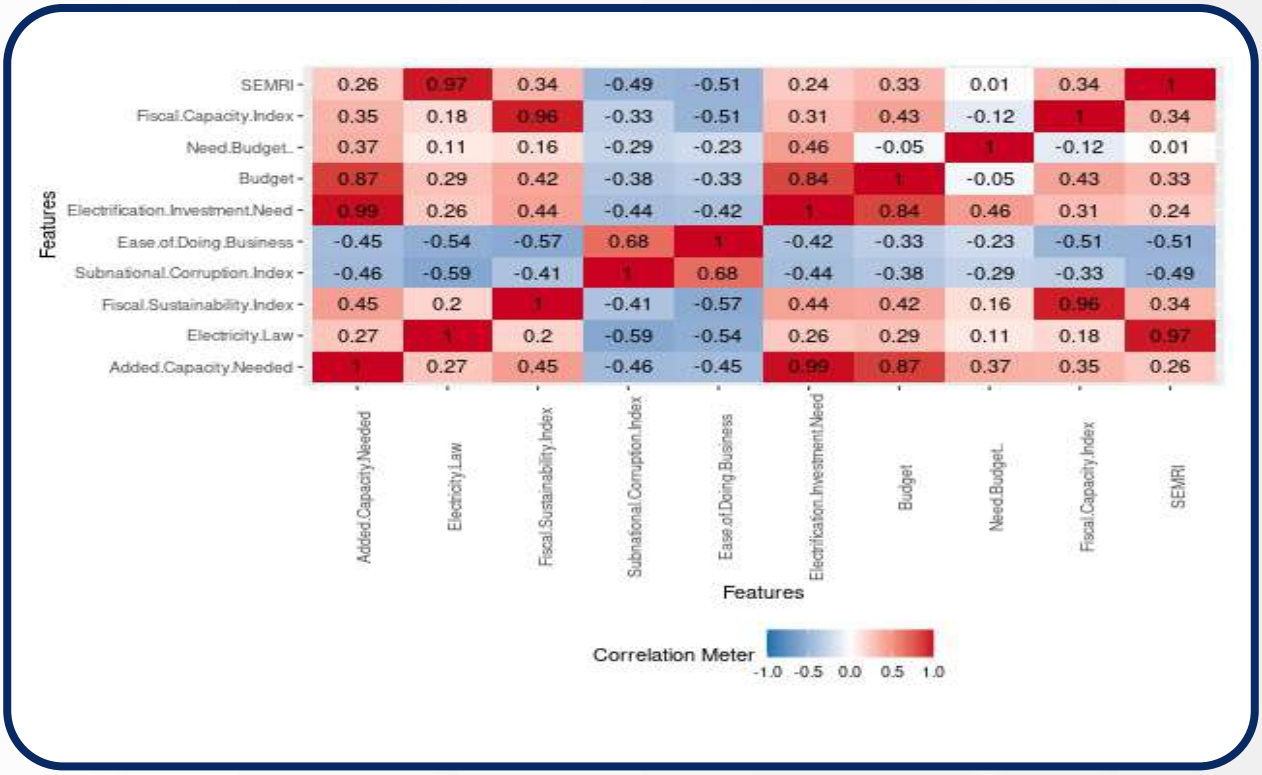


Figure 1: Correlation matrix for all indicators.

[7] World Bank (2018). Doing Business in Nigeria 2018. Washington, DC: The World Bank. https://subnational.doingbusiness.org/content/dam/doingBusiness/media/Subnational-Reports/DB_in_Nigeria_2018_w-bookmarks.pdf. The DTF score for each indicator shows how far a location is from the best performance achieved by any economy on each Doing Business indicator. The metric covers State performance across the following: procedures, time, cost and paid-in minimum capital to start a business; procedures, time and cost to complete all the formalities to build a warehouse; procedures, time and cost to transfer a property; time and cost to resolve a commercial dispute; quality of building regulation and its implementation; quality of the land administration system; and quality of judicial processes.

All indicators were standardized using min–max normalization to bring them onto a comparable scale. A weighting of 25% each for the fiscal space (FS) indicator and Ease of Doing Business Index (EDBI), 20% for the Fiscal Sustainability Index (FSI), 20% for presence of electricity law (PEL), and 10% for Subnational Corruption Index (SCI).

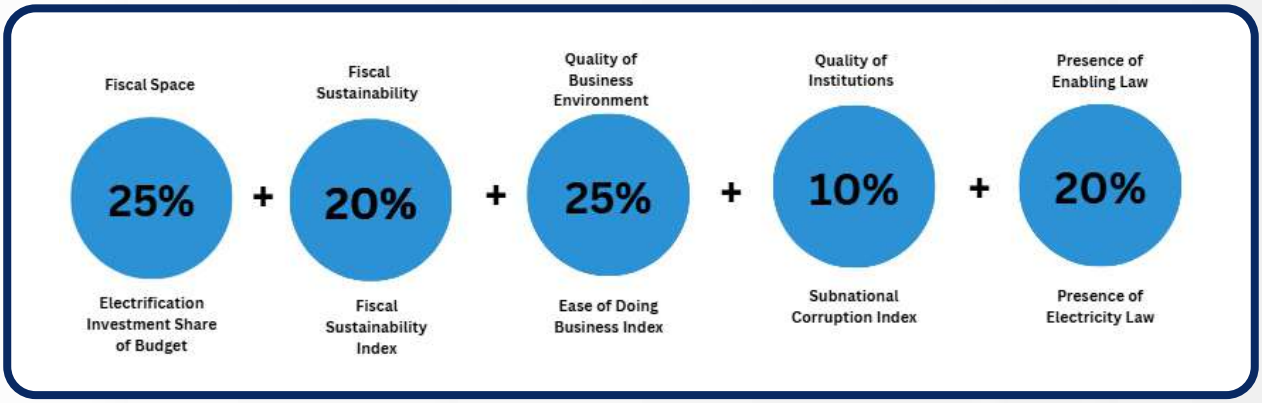


Figure 2: Weighting for each indicator in the index

The following formula is then used to create the index:

$$SEMGRI = 0.25(FS) + 0.2(FSI) + 0.25(EDBI) + 0.2(PEL) + 0.1(SCI)$$

The index scores range from 0 (lowest readiness) to 1 (highest readiness). For interpretation, results were grouped into four readiness categories:

- 0–0.25: Very Low Readiness
- 0.25–0.50: Low Readiness
- 0.50–0.75: Medium Readiness
- 0.75–1: High Readiness

Results

The results are presented for each indicator and finally for the composite index. The CTH-SEMGRI rankings are available in the Annex.

Fiscal Capacity

States vary significantly in the investment costs of achieving universal electrification (Figure 3), both between Lagos State ($3 billion) and the rest (average $540 million), and among the States outside of Lagos (from $162 million minimum in Yobe to $1.3 billion in Kano).

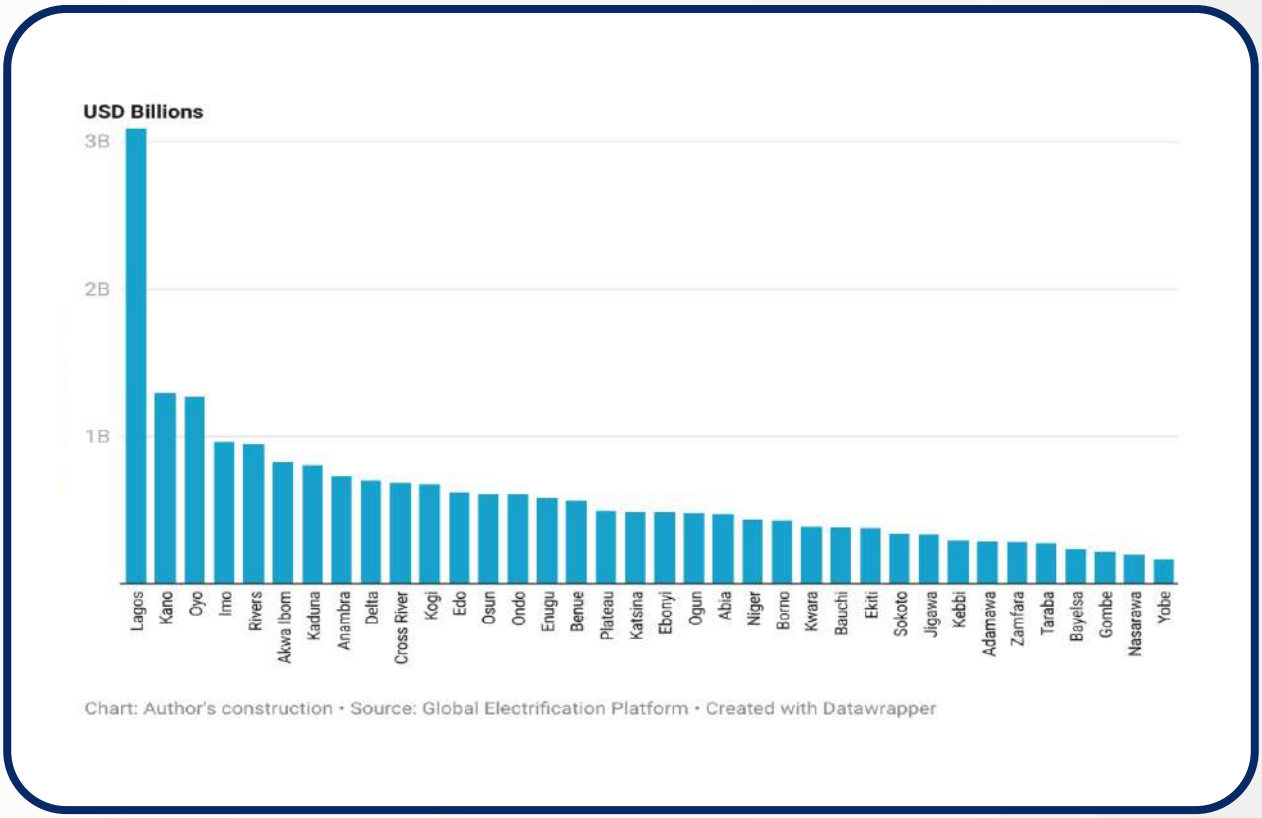


Figure 3: Investment costs of achieving 100% electricity access by 2030

Nearly half (42%) of all States have high fiscal space to pursue 100% electrification within a decade. This means that for 15 States, the annual investment cost of universal electrification is lower than 10% of their annual budget. For 12 other States, on the other hand, there would likely be some difficulty with budgetary allocations to the power sector. For these one-third of States, there is medium fiscal space (10-15% of the annual budget) to finance universal electrification. Finally, one in four States has low fiscal space (above 15% of annual budget), which suggests that the burden of universal electrification would be greatest for such States. Among these nine States with the lowest fiscal space, it would take from just over 15 years in Kaduna and Benue to 27 years in Oyo State to achieve 100% electrification if 10% of their annual budgets are allocated for electrification.

Notable Points

- Investment needs for universal electrification vary widely, from $162M in Yobe to $3B in Lagos.
- Only 42% of States can finance full electrification within a decade; others face medium to low fiscal space and longer timelines.

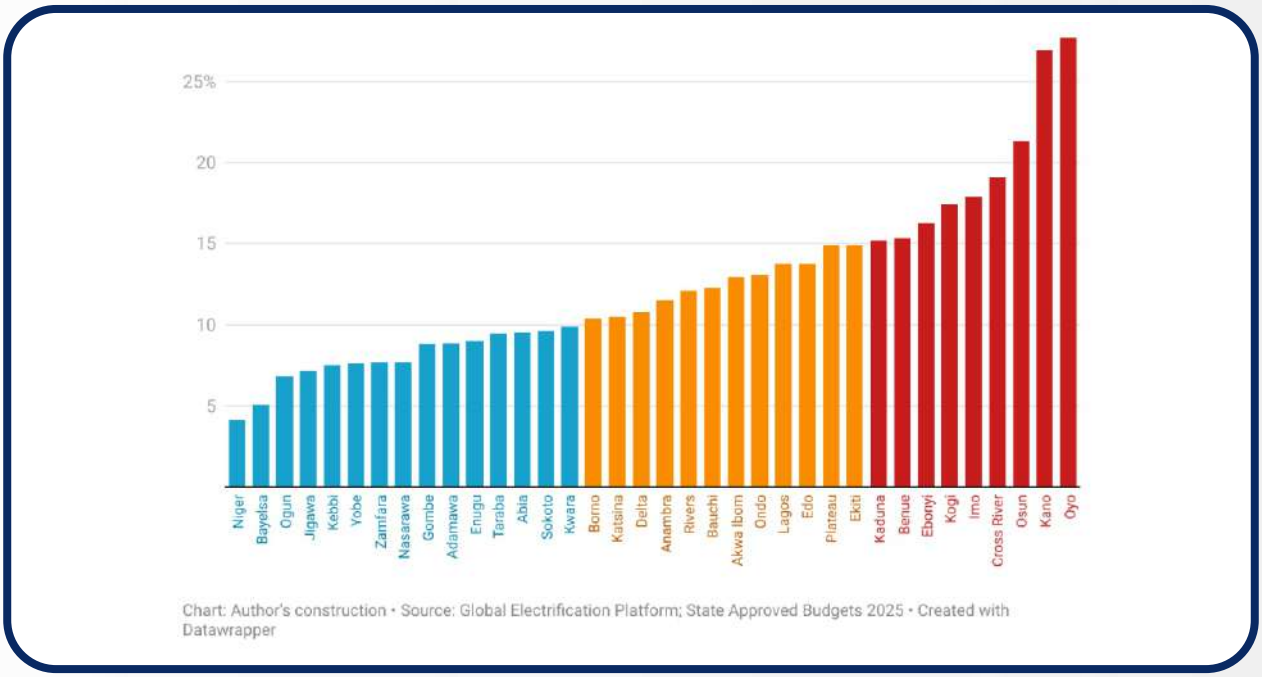


Figure 4: Annual electrification investment costs as a percentage of States' 2025 approved budgets (Blue = High Fiscal Space; Orange = Medium Fiscal Space; Red = Low Fiscal Space)

Quality of Institutions and Business Environment

Northern States rank highly on the Subnational Corruption Index, whereas performance on the Ease of Doing Business Index is more varied (Figure 5).

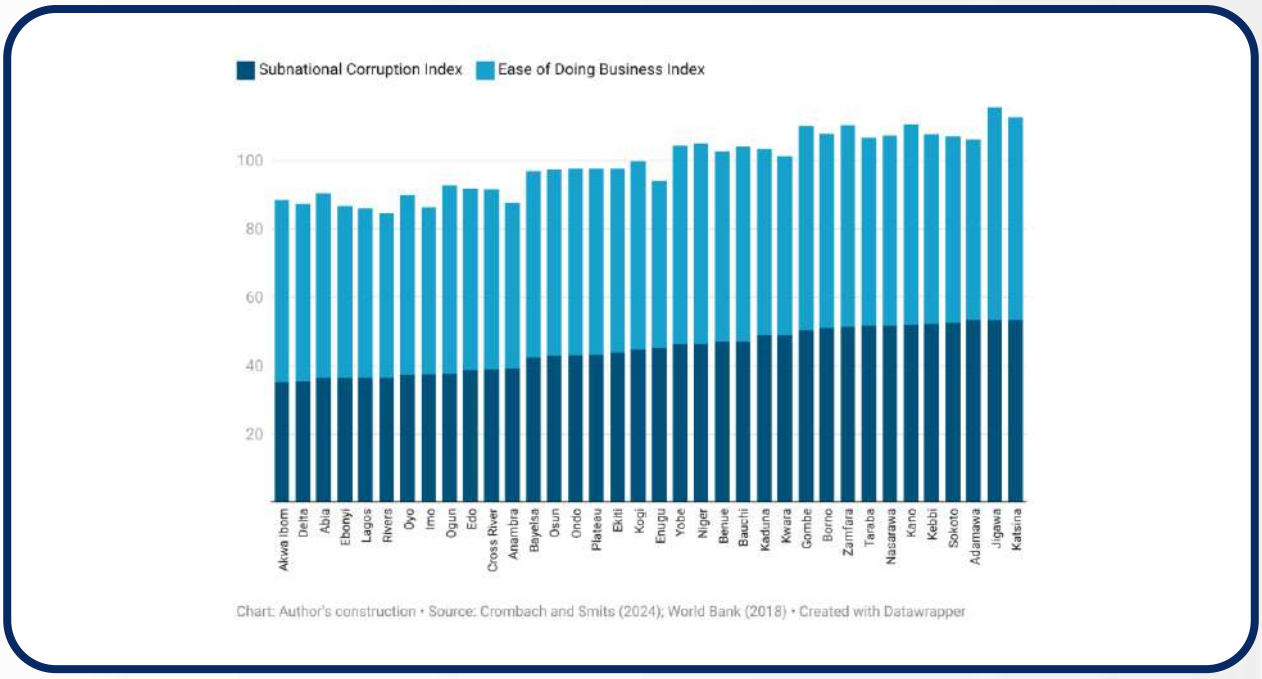


Figure 5: Subnational Corruption Index and Ease of Doing Business Index by State

There is a modest positive correlation (a correlation coefficient of 0.68) between the Subnational Corruption Index and the Ease of Doing Business Index, suggesting that the States that have better institutions (proxied by the experience of corruption) tend to also have better business environments (Figure 6).

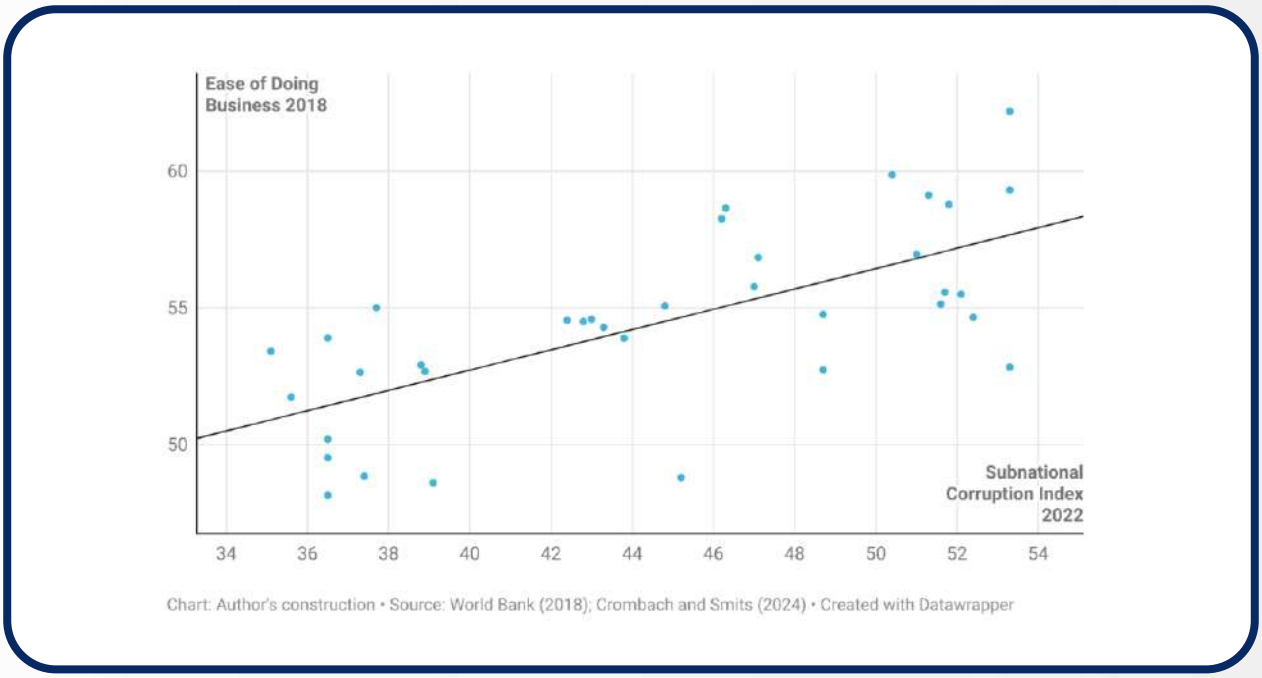


Figure 6: Scatter plot depicting positive relationship between subnational Ease of Doing Business Index in 2018 and Subnational Corruption Index in 2022

However, informal engagement with some mini-grid developers suggests that there are already a few difficulties emerging with State electricity market governance. Some developers report that the electricity regulatory commissions/boards in some States are making mini-grid regulations more difficult for developers than is the case with the Nigerian Electricity Regulatory Commission (NERC) which operates at the federal level. Whereas obtaining a mini-grid permit from NERC is a one-off exercise, one State is known for placing a one-year validity on mini-grid permits. Another complaint by mini-grid developers is that spurious fees and fines are being imposed on developers, which, in combination with the requirement for annual renewal of permits, suggests that State electricity boards are viewing the mini-grid sector first as a revenue generation source, rather than primarily as a means of fostering electricity access. These are the types of challenges that can emerge with poor-quality institutions.

Presence of Enabling Law

As of August 2025, most (67%) States have enacted electricity laws that provide the legal framework for their intended electricity market interventions (Figure 7). Most of these laws were passed between 2023 and 2024.

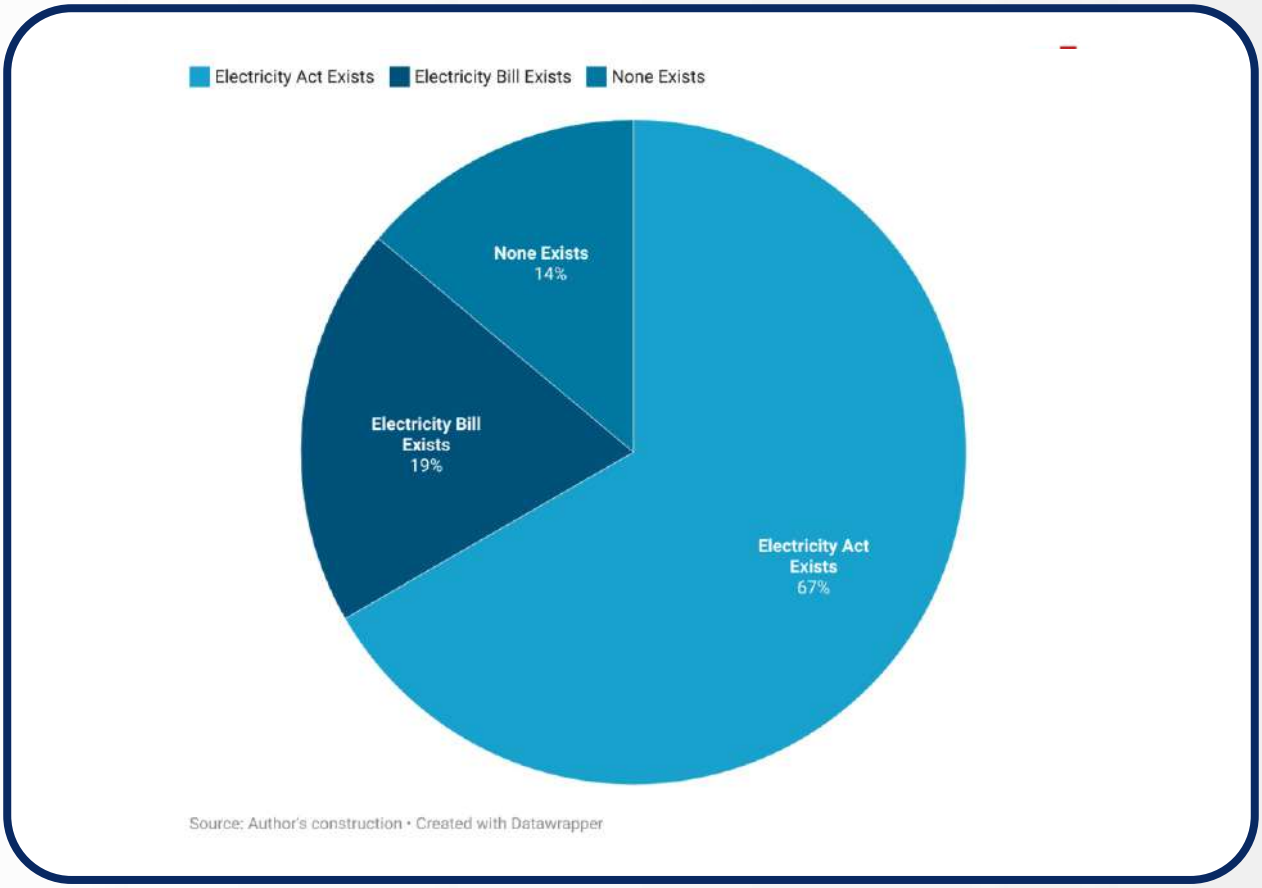


Figure 7: Percentage of States that have enacted electricity laws or have introduced electricity bills

Almost one in five States has an electricity bill that is undergoing reading in the State House of Assembly. A key challenge is that most States do not publish their laws and policies online, and there is currently no digital repository of these documents available online.

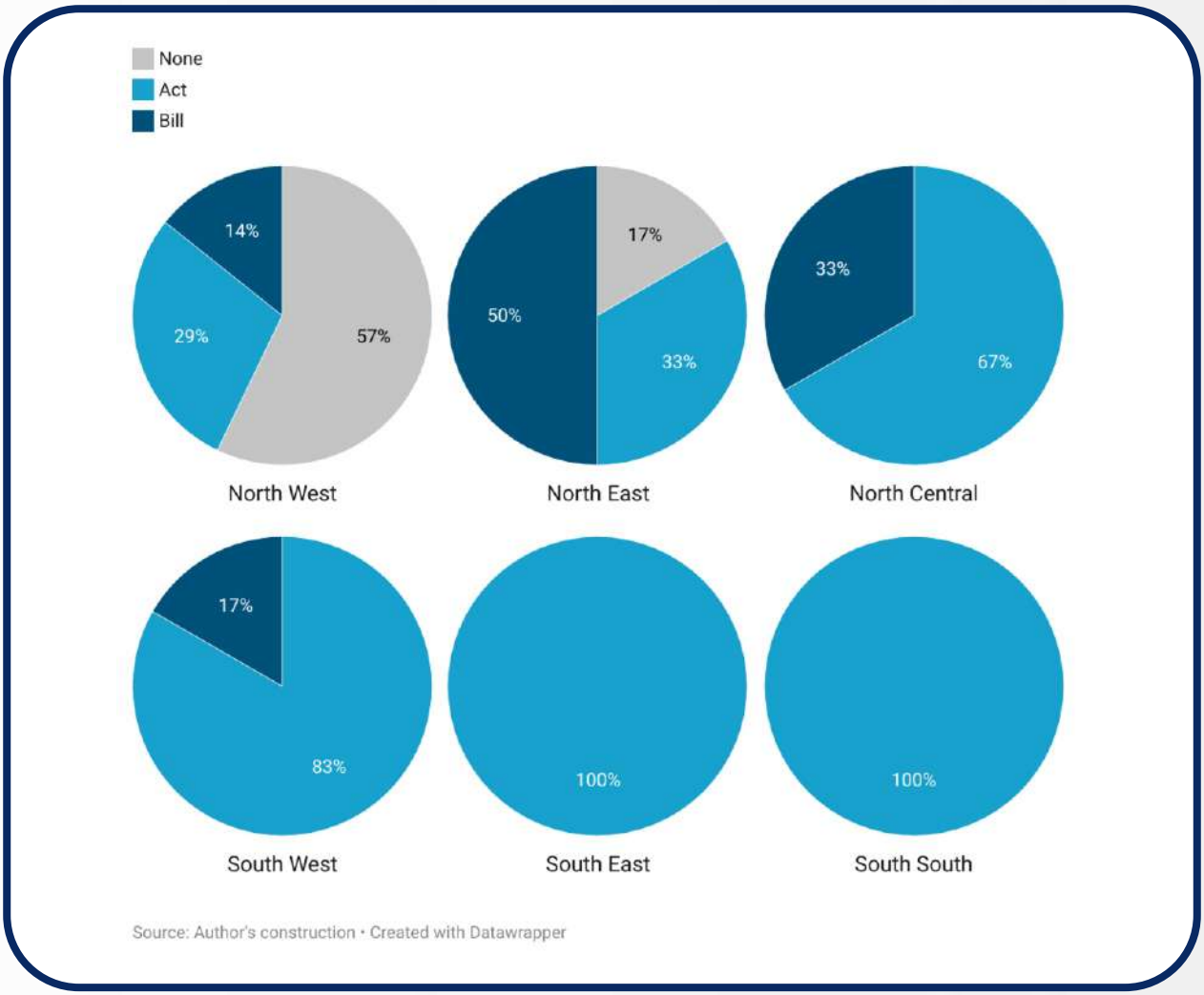


Figure 8: Percentage of States in each region by status of electricity law or bill

If having an electricity law or at least a bill in progress is considered, the worst-performing geopolitical zone is the North West, where only 57% of States in the zone have neither enacted electricity laws nor introduced electricity bills. The best performers are the South East and South South, although 100% overall of southern States have either enacted electricity laws or introduced electricity bills (Figure 9).

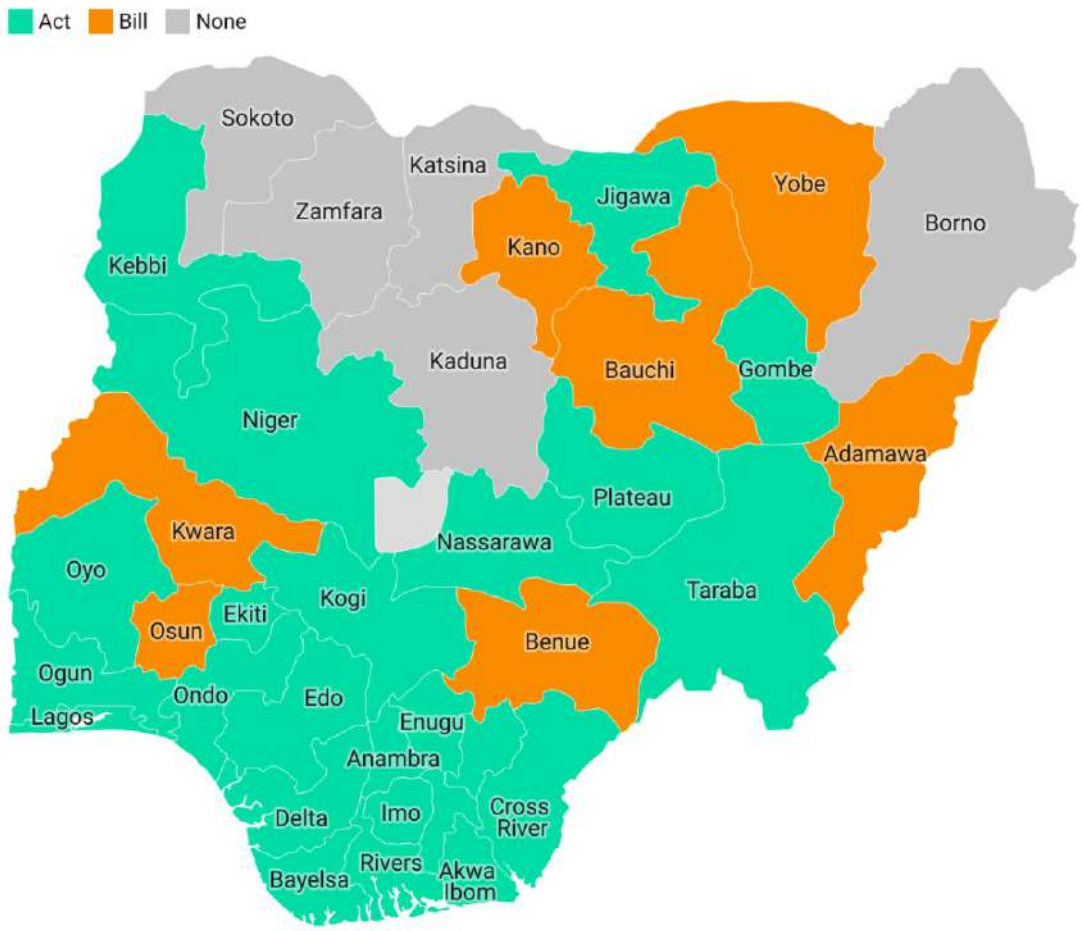


Figure 9: Location of States with electricity laws and bills

Notable Points

- By August 2025, 67% of States had enacted electricity laws, with nearly 20% more having bills in progress.
- Regional gaps persist. While all southern States have laws or bills, 57% of North West States lack both.

Overall State Ranking

Overall, while no State may be classified as having high level of readiness, only 7 States of the Federation may be classified as having medium readiness for electricity market governance. The rest have a low level of readiness (Table 1). The top 10 most ready States are spread across the country, with 30% of these in the North West, 20% in the North Central, 20% in the South West, 10% in the North East, and 10% in the South South (Figure 10).

Table 1: The Clean Tech Hub State Electricity Market Readiness Index (CTH-SEMGRI) State rankings. Orange indicates medium level of readiness, and red indicates low readiness.

	State	CTH-SEMGRI
1	Kano	0.681
2	Oyo	0.593
3	Gombe	0.588
4	Jigawa	0.582
5	Kogi	0.543
6	Cross River	0.535
7	Kebbi	0.504
8	Ekiti	0.503
9	Nasarawa	0.503
10	Taraba	0.500
11	Ondo	0.497
12	Rivers	0.492
13	Plateau	0.491
14	Niger	0.488
15	Osun	0.488
16	Edo	0.479
17	Benue	0.450
18	Bauchi	0.444
19	Lagos	0.438
20	Ogun	0.434
21	Ebonyi	0.432
22	Akwa Ibom	0.417
23	Abia	0.411
24	Anambra	0.409
25	Kwara	0.401
26	Imo	0.396
27	Katsina	0.392
28	Yobe	0.390
29	Delta	0.388
30	Kaduna	0.383
31	Bayelsa	0.374
32	Adamawa	0.371
33	Enugu	0.365
34	Zamfara	0.355
35	Borno	0.347
36	Sokoto	0.307

Source: Author's Construction • Created with Datawrapper

The highest performing States tend to have higher scores on the Ease of Doing Business Index, have enacted electricity laws, have less corruption and have greater levels of fiscal capacity. The leading role of ease of doing business is

Conclusion and Recommendations

The CTH-SEMGRI may be valuable for actors looking to identify the best States to direct technical assistance for the improvement of electricity market governance capacity. Without a reliable readiness measure, many State actors may not have considered the full set of preconditions required, beyond having an electricity law and regulatory agency, to successfully govern an electricity market.

Nonetheless, the CTH-SEMGRI is merely an indicator of State electricity governance readiness and should be utilised carefully. Some States, for example, may have low fiscal space, but due to their enabling environments and large potential electricity market, are able to attract more private finance and grants from development finance institutions than some States with high fiscal space. In addition, the presence of an electricity law is merely the first step in electricity market regulation. The content and quality of such laws and subsequent regulations, as well as the implementation capacity of regulatory and implementing bodies play a role in determining the quality of electricity market governance. Therefore the SEMGRI should be paired with other indicators of electricity market governance.

In order to improve the availability of more accurate data upon which to make judgements about the viability of States for electricity market governance, further action needs to be taken in the following directions:



Accessibility: States should have an online repository where electricity laws, regulations and policy documents are housed, to make it easier for industry practitioners, project developers, potential investors and the general public to find information. In addition, simplified versions of these documents should be available to enhance public knowledge of the contents of these documents.



Uniformity: Variation in institutional capacity, fiscal capacity and political economy of States suggests that electricity market players may experience wide variation in State regulatory practices. Key players need to come together, develop best practice frameworks, and advocate for State government actors to voluntarily sign onto such frameworks.



Further Research: As more market players garner experience in operating within each State's electricity market, researchers would need to incorporate experiential data in assessing each State's quality of electricity market. This would help to better understand the drivers of improper behaviour by State electricity governance institutions, the adaptive measures taken by market operators, and the impacts of various reforms and practices on different stakeholders.

Annex

Annex A: Fiscal Space

Fiscal Space is calculated as:

$$[[(TEIN \div Time) \times (PS \times SGS)] \div Budget] - 1]$$

Where:

- TEIN = Total Electrification Investment Needs (in US$)
- Time = 10-year period to achieve 100% electrification
- PS = Public share of State electrification investment
- SGS = State government share of State electrification investment
- Budget = 2025 State government budget (in US$)

- TEIN refers to the generation, transmission and distribution investment needs for electrifying unelectrified populations based on a least-cost planning approach, and does not include the investment needs for improving the performance of the State's main grid because there is presently no such data (e.g. the National Integrated Resource Plan focuses on the national level, and only Lagos State has produced a State IRP, while the Rural Electrification Agency's State-level investment need estimates focus on the cost of achieving universal electrification).[8]
- PS is obtained from the literature. While the public sector accounted for about 25% of the total investment in renewables from 2013 to 2020,[9] and the National Energy Compact targets a public share of last-mile investment in Nigeria of 33%,[10] across Africa, 57% of total energy finance has come from public institutions.[11] We use the higher figure (57%) for Nigeria, which we think may be more realistic and conservative.

[8] For example, while the Global Electrification Platform (GEP) estimates an added capacity of 1,400 MW for Lagos State to achieve universal energy access, the Lagos State Integrated Resource Plan has a 'most likely scenario' of forecasted peak energy demand of 4,012 MW by 2030 (and 3,321 MW) under a low growth scenario. This suggests that Lagos State could need an additional $6 billion to meet growth in demand from its national grid. Similarly, while the GEP estimates Yobe to need an additional 14 MW to achieve universal energy access, Yobe State estimates that power demand growth of 300 MW will occur by 2030. UAPPPIP (n.d.). "Power Sector". https://yobeinvest.ng/power-sector/.

[9] IRENA and CPI (2023). *Global landscape of renewable energy finance 2023*. Abu Dhabi: International Renewable Energy Agency and Climate Policy Initiative. www.irena.org/Publications/2023/Feb/Global-landscapeof-renewable-energy-finance-2023.

[10] Mission 300 (2025). National Energy Compact for the Federal Republic of Nigeria, p. 6. https://thedocs.worldbank.org/en/doc/2340747bcba6747a15a4ff8cba935fce-0010012025/original/M300-AES-Compact-Nigeria.pdf.

[11] Moses, Oyintarelado (2023). *Who Finances Energy Projects in Africa?* Washington, DC: Carnegie Endowment for International Peace. https://carnegieendowment.org/research/2023/11/who-finances-energy-projects-in-africa?lang=en.

- SGS of 38.6% is based on the World Observatory on Subnational Government Finance and Investment (SNG-WOFI) estimate of subnational (State and LGA) public expenditure as a percentage of total public expenditure in 2020.[12]

Annex B: Selection of Weighting Scheme

The weighting scheme was selected based on a series of quantitative analyses, including sensitivity/robustness analysis using rank correlations across schemes, Kendall's W test, rank ranges, sensitivity line plot, and a Monte Carlo simulation (boxplot), as well as an empirically-driven regression analysis.

Five alternative weighting schemes explored are examined, with the fiscal space and fiscal sustainability indicators having weights of 20%, 25%, 30%, 35% and 40%, respectively, while other indicators share the remaining percentages.

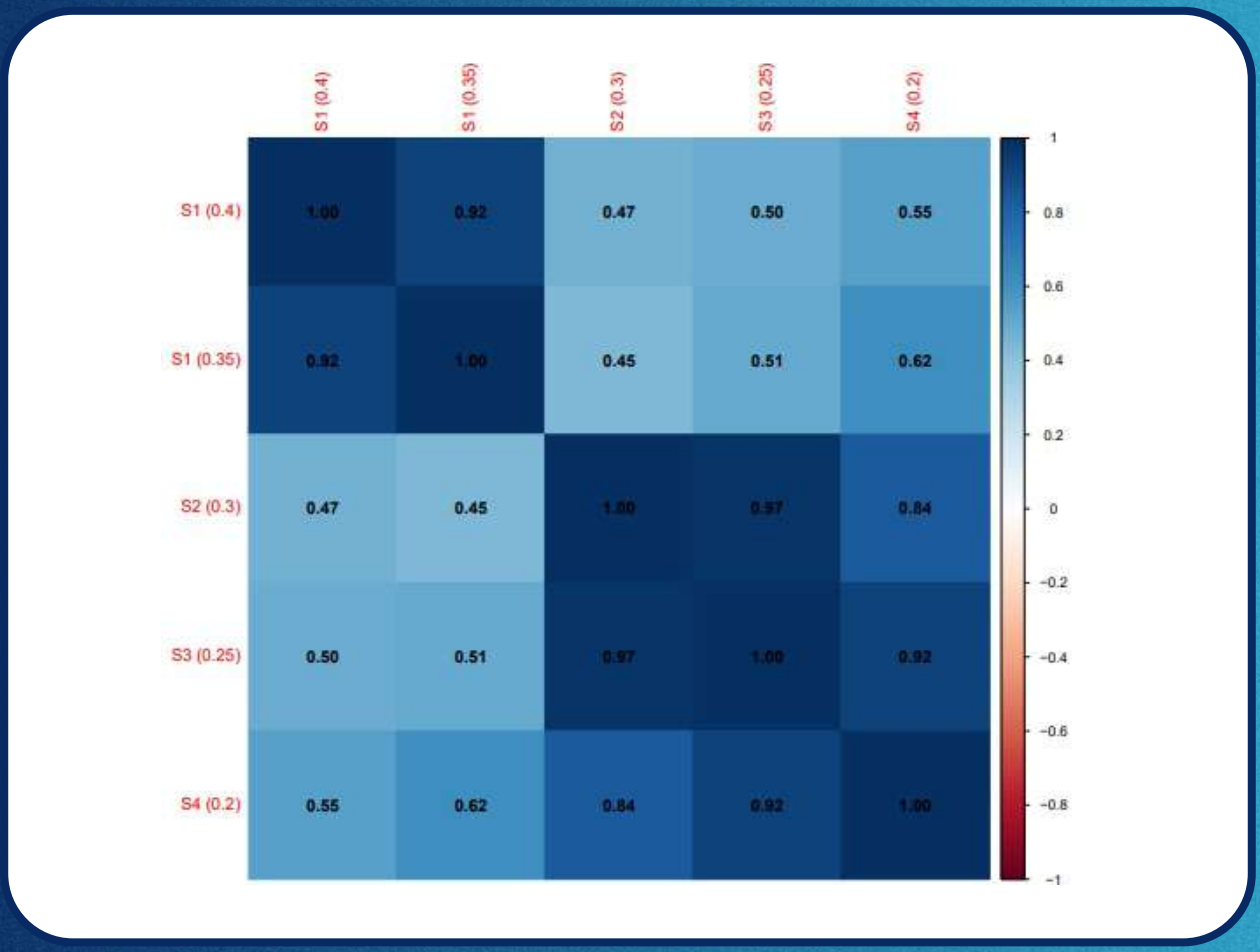


Figure 10: Spearman Correlation Between Weighting Schemes

[12] SNGWOFI (2022). "Nigeria". https://www.sng-wofi.org/country_profiles/nigeria.html.

The correlation matrix in Figure 10 shows that the alternate composite indexes are highly correlated up to a weighting of the financial variables of 30%, beyond which correlation coefficients decline substantially.

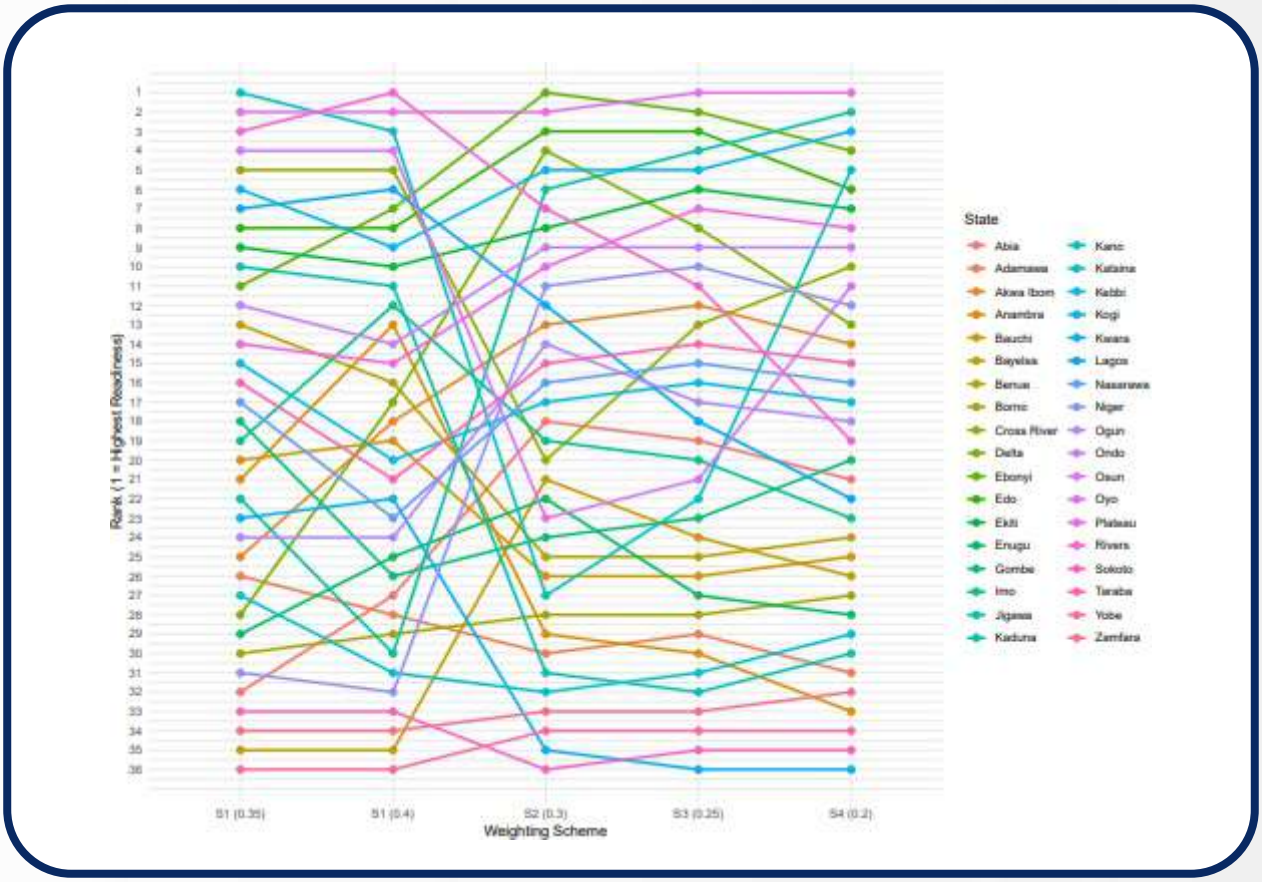


Figure 11: Sensitivity of State Rankings to Weighting Schemes

The rank ranges (Figure 11) indicate that while some States consistently stay near the top ranks (1–4) regardless of weights, and others consistently remained at the bottom ranks (30+), a middle group of States (e.g., Kwara, Plateau, Benue) showed moderate shifts (ranges of 5–10 places), meaning their position is somewhat sensitive to fiscal weighting assumptions. Again, the instability in ranking is mostly concentrated when moving above a 30% weighting for the fiscal indicators. This further buttresses a 30% ranking as optimal.

To be more rigorous, we ran a Monte Carlo Simulation that randomly generates 1,000 weighting schemes, thereby providing a more probabilistic robustness test. Each State's rank distribution (via boxplots) shows how often it falls in top, middle, or bottom positions across many possible fiscal weights. Figure 12 suggests that States like Jigawa, Kano, Gombe and Katsina had tight, stable rank distributions (i.e. they are reliably high performers), States like Imo, Anambra and Delta had tight distributions but consistently poor ranks, while States like Osun, Sokoto and Kaduna showed wider distributions, meaning their readiness ranking

is more sensitive to fiscal weight assumptions, and others like Bauchi and Edo are consistently middle-ranking States.

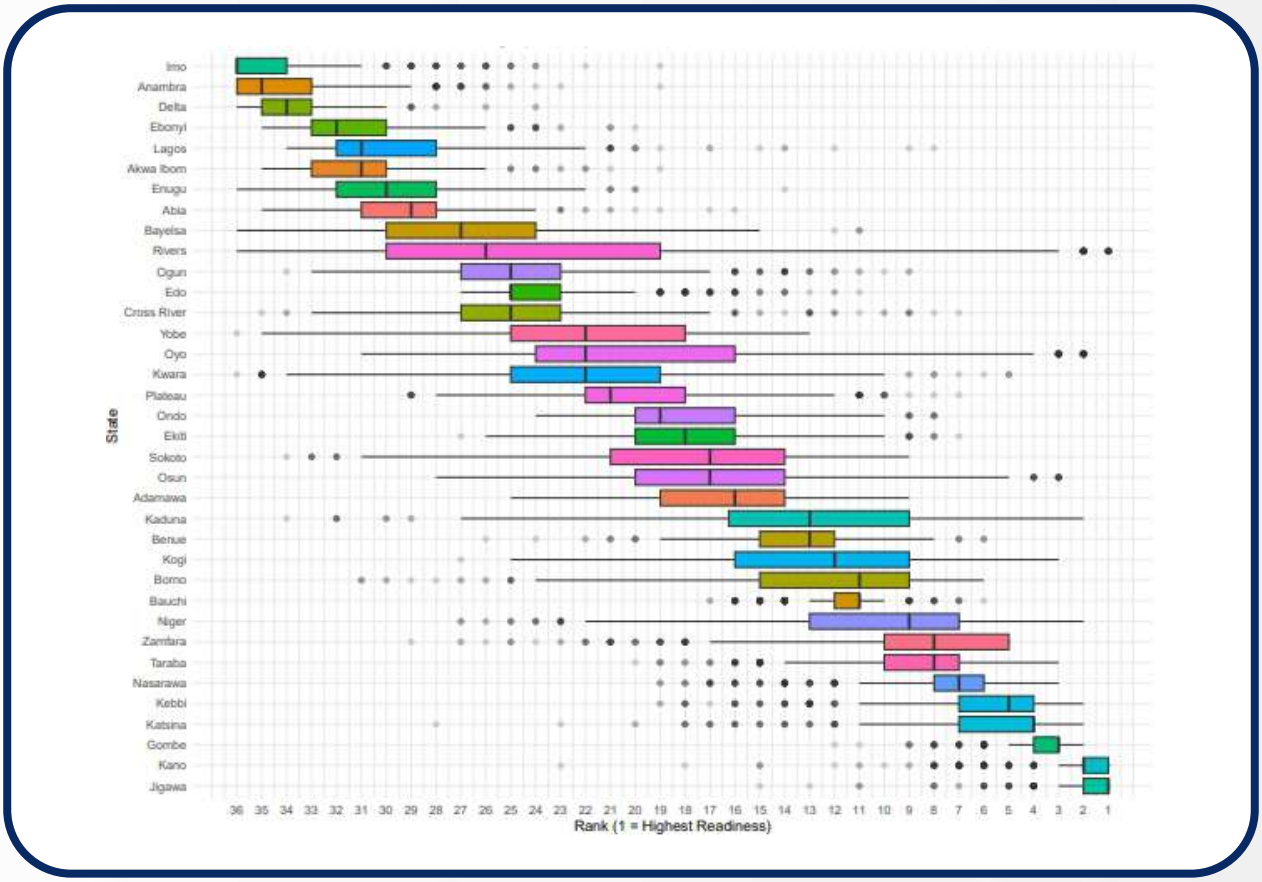


Figure 12: Monte Carlo Simulation of State Rankings (Boxplot)

In order to provide a more empirical basis for the weighting scheme, we applied similar indicators to a different domain where State Governments have a major role to play —the health sector. State and local governments have the primary responsibility of providing public primary healthcare services in their States and Local Government Areas.[13] Data on State health expenditure (Health.Expend) was obtained from the Nigerian Governors Forum Public Finance Database,[14] while data on presence of health clinics for each State (Health.Clinic.Prevalence) was obtained from Afrobarometer survey data Rounds 8 and 9.

[13] Abubakar, Bashar (31 August 2022). "The State of States on Primary Healthcare Delivery in Nigeria", *Nigeria Health Watch*. https://articles.nigeriahealthwatch.com/the-State-of-States-on-primary-healthcare-delivery-in-nigeria/.
[14] Health expenditure was converted into per capita format using State population estimates obtained from OPHI (2024). "Table 5 Subnational Results MPI 2024". https://ophi.org.uk/global-mpi/2024.

States.[15] Since all Nigerian States are mandated to have health sector policies due to the National Health Act of 2014, no variable indicating presence of a health sector policy was included. The BudgIT Fiscal Sustainability Index (FSI), Ease of Doing Business Index (EDB) and Subnational Corruption Index (SCI) remained the same.
The following OLS unbalanced panel regression model was estimated:

$$Health.Clinic.Prevalence_{it} = \beta_0 + \beta_1 FSI_i + \beta_2 SCI_i + \beta_3 EDB_i + \beta_4 Health.Expend_{it} + \varepsilon_{it}$$

Using the estimated coefficients, the percentage contribution estimate for each variable was obtained by undertaking a relative importance analysis using the Lindeman, Merenda, and Gold (LMG) metric.[16] The estimates (Figure 13) indicate that enabling environment and fiscal capacity indicators are the most important variables explaining variation in health clinic prevalence across Nigerian States.

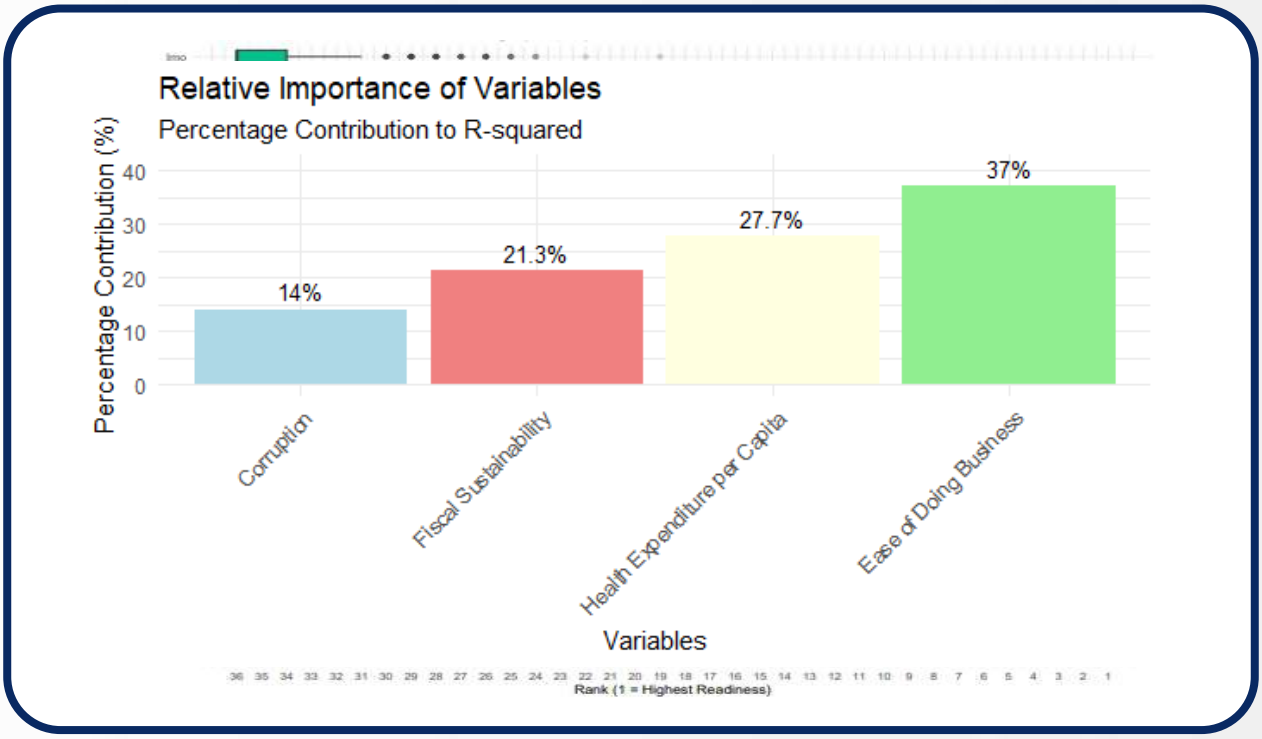
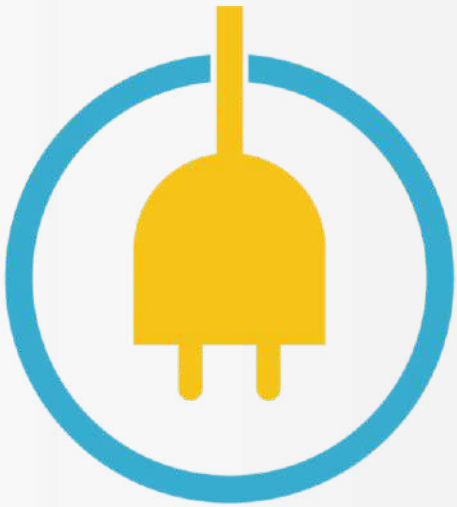


Figure 13: Relative contribution of variables to variation in cross-State health clinic prevalence

[15] Measured as the percentage of respondents within a State who respond "Yes" to the question " Are the following facilities present in the primary sampling unit/enumeration area or in easy walking distance: Health clinic (private or public or both)?"
[16] Lindeman, Richard H., Merenda, Peter F., & Gold, Ruth Z. (1980). *Introduction to Bivariate and Multivariate Analysis*. Glenview, IL: Scott, Foresman. This approach calculates each variable's average contribution to the R-squared across all possible orderings of regressors in a linear regression model, thereby accounting for multicollinearity and providing a fair distribution of explained variance among predictors. The analysis was conducted on standardized variables to ensure comparability within the unbalanced panel structure, and the resulting LMG values were converted to percentages to show each indicator's proportional explanatory power in predicting Primary Health Center (PHC) prevalence across Nigerian States.

Based on this finding, as well as the 30% limit for financial indicators implied in Figures 11 and 12, a weighting of 25% each for the fiscal capacity indicator and Ease of Doing Business Index, 20% for the Fiscal Sustainability Index, 20% for presence of electricity law, and 10% for Subnational Corruption Index would be well within the range of optimality.



Clean Technology Hub
Energy Innovation Centre