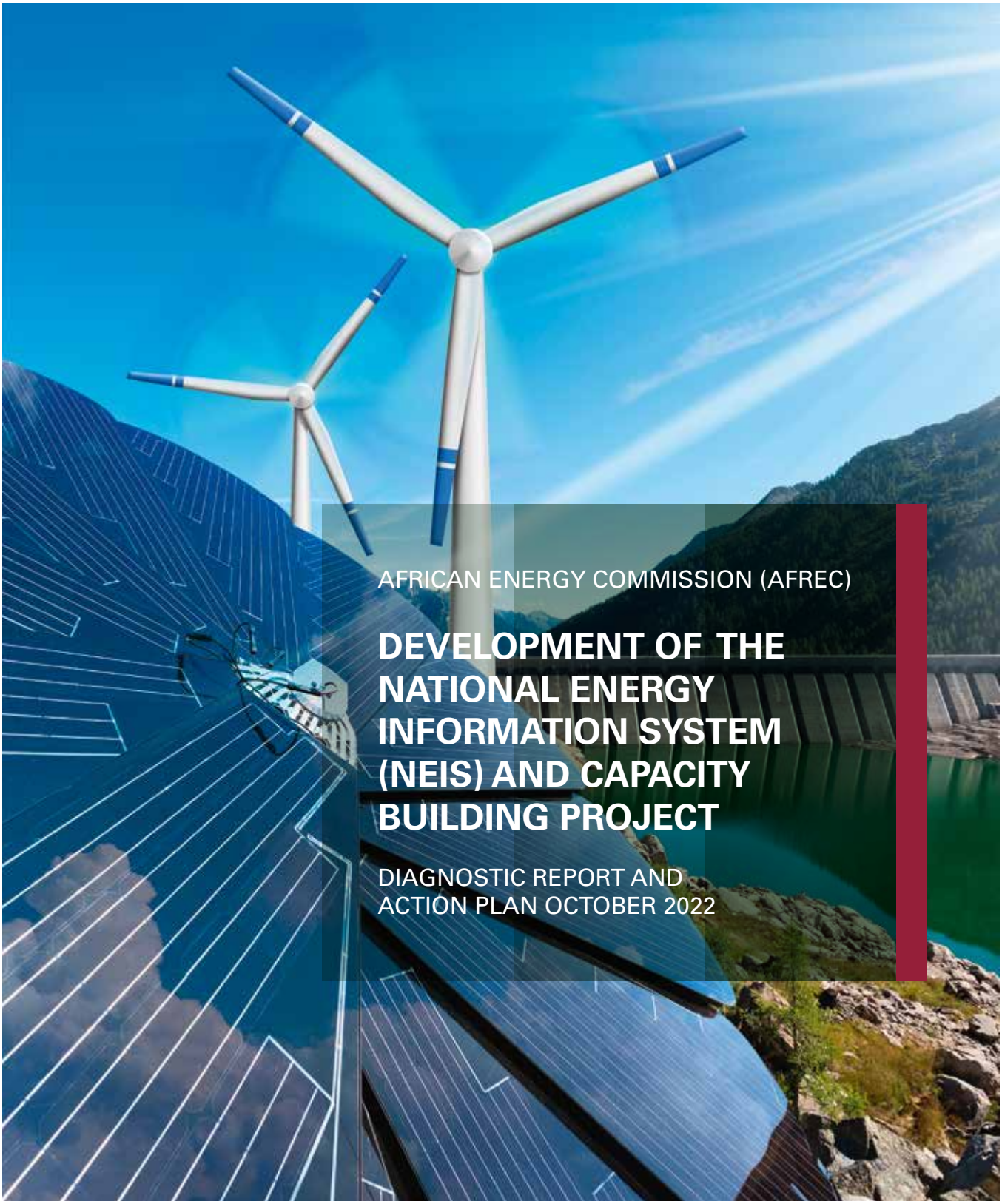
African Energy Commission
Commission Africaine de l'Energie

Energy
Commission

Federal Republic
of Nigeria



AFRICAN ENERGY COMMISSION (AFREC)

DEVELOPMENT OF THE NATIONAL ENERGY INFORMATION SYSTEM (NEIS) AND CAPACITY BUILDING PROJECT

DIAGNOSTIC REPORT AND
ACTION PLAN OCTOBER 2022

Prepared for the Energy Commission of Nigeria

DEVELOPMENT OF THE NATIONAL ENERGY INFORMATION SYSTEM (NEIS) AND CAPACITY BUILDING PROJECT

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AFRICAN UNION
AFREC ENERGY
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FOREWARD

I am delighted to present the diagnostic report and the action plan therefrom for the development of the Nigeria National Energy Information System (NEIS) and capacity building project. The report is a result of the assessment conducted by the African Energy Commission (AFREC), to standardise the current National Energy Information Systems (NEIS) of African Union (AU) Member States with the objective to improve the quality of energy data supplied to the African Energy Information System (AEIS), and adherence to energy data collection and reporting and adaptation to countries needs in alignment with international standards.

The diagnostic report reveals several challenges, such as lack of insufficient data for the energy balance, low quality data or non-existence, lack of skilled human resource capacity to process data and lack of adequate technology infrastructure to maintain systems to mention just a few. Hence, this report is profound as it cultivates a route to the improvement of the Nigeria National Energy Information System (NEIS).

Energy Commission of Nigeria is cognisant of the need to improve Nigeria energy data collection methods by setting up systems which respond to the country's data needs to and to improve energy data quality and coverage. The development of the Nigeria NEIS is a necessary and critical tool in achieving this goal, which can enable us to have bankable data to conduct energy programming better, improve government efforts for better planning, policy making and making informed decisions related to the country's energy sector transformation.

AFREC's support on the development of the NEIS will help the Nigeria Government to increase the quality of the energy statistic processes, which is strategic for attracting investment in the energy sector. The capacity building programme which forms part of the NEIS development will also provide us with insights necessary for strengthening capacities at national and local level, which will further prepare us to manage the system effectively and address national, regional and continental needs.

Prof. Eli Jidere Bala
Director General, Energy Commission of Nigeria

COMISSIONNER'S STATEMENT

Africa through the African Union is intensifying efforts to achieve universal access to affordable reliable electricity and to chart its pathway to cleaner and greener energy as set out in Africa's Agenda 2063 & the UN Sustainable Development Goal-7. This ambition is fulfilled through our commitment by improving Africa's energy data systems and reducing skills deficit in the area of energy statistics to improve energy data quality and accessibility across the continent so that quality and reliable data remains the backbone of Africa's energy sector development and transformation.

As a Commission, we firmly believe that data driven strategies and policies provides a clear understanding of energy uses for our continent, promotes efficiency of energy systems, provides opportunities for better output and use, to address climate change and identify cost effective steps which have the ability to model the future.

Hence, the African Energy Commission (AFREC) together with its African Union (AU) Member States, have been working to harmonise energy data on the continent to ensure Africa have a hosting environment for Africa's energy data. At the continental level, AFREC has developed the continental energy data hub - the African Energy Information System (AEIS), which is comprised of raw data collected form member states and reflects a true representation of the actual energy performance in African Countries. The establishment of the AEIS has led to the decision to establish and/or improve member states national Energy Information Systems (NEIS) to ensure the AEIS and NEIS information is interfaced and that countries are able to access other's data and a full technical capacity building programme is enhanced.

The AEIS and NEIS will provide comprehensive and timely energy statistics which enhances data dissemination and inform debates whilst improving the countries' ability to produce energy statistics, and strengthen capacity through technical support. Africa's Common Position on energy access and just transition also asserts that energy transition cannot simply be about decarbonization alone. But importantly, it must be catalyst to bridge energy access gap and encourage productive uses, thereby creating new competitive industrial clusters.

Thus, this report is a true reflection of our actions going forward, to ensure energy data collection processed at member states level is done in an effective and collaborative manner, to help Africa improve data modeling, develop impactful energy projects, mobilise resources for investment in energy projects as well as monitor how countries are addressing climate change challenges. I do hope that this report will assist African countries to take decisive actions to build the NEIS as advised in this report for the benefit of the sector transformation and economic advancement of our people.

H.E Dr Amani Abou-Zeid
Commissioner for Infrastructure and Energy
African Union Commission.

Summary

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INTRODUCTION

The African Energy Commission (AFREC) has launched the programme on **«Improving the National Energy Information System & Capacity Building»** to assess and standardise the current National Energy Information Systems (NEIS) of the African Union (AU) Member States with the objective of improving the quality of content supplied to the African Energy Information System (AEIS), adhere to energy data collection and reporting as per international standards as well as adapt to the data needs of Member States.

In this context, AFREC has signed a consultancy contract with the consultant (Innovation Energie Développement (IED)) on December 13th 2021, to support eleven (11) AU member countries to establish and/or improve the National Energy Information System (NEIS) with main objective is **to increase the quality of data collected** at the national and regional level (notably through the AEIS coordinated by AFREC); **expand the coverage of NEIS** to include more energy indicators; and **improve member states' capacity to manage and use data as a decision-making tool for policy**, investment and strategy in the energy sector.

The specific objectives of the project are threefold:

- **To build capacity and improve the systems** used to collect, compile, validate and disseminate energy statistics;
- **To reinforce the adoption of AFREC's methodology and questionnaires** in line with international best practice and the IRES standards;
- **To harmonize and streamline energy statistics across member states**, to allow for regular update of the AEIS and comparability across the region.

The NEIS & Capacity Building project is currently at the pilot stage, with a targeted rollout to eleven AU Member States. AFREC envisages to extend the project to other countries in order to reinforce statistical capacity across all AU Member States. Thus, a secondary objective of this project is therefore to provide comprehensive feedback regarding the structure and activities of the project in order to contribute to the pilot evaluation and any future adjustments to the program structure. The phase two of this project is already planned by AFREC for 2023 targeting more additional member states.

The selection of the of participating countries in the first phase of the project was based on the expression of interest of those countries to the support offered from AFREC. The participating countries are representing different African regions, energy sector characteristics, mature and advancement of energy statistics and NEIS development. The 10 countries are:

1. Algeria
2. Botswana
3. Burkina Faso
4. Congo
5. Gabon
6. Kenya
7. Nigeria
8. Lesotho
9. Namibia
10. Zimbabwe

Participating countries

Key achievements

The project lasted 12 months, from January 2022 to December 2022. Based on stakeholders' interviews and supported by continual analysis of data and documentation shared by country focal points, the key achievements of the project are the following:

- **Diagnostic Report** for each country, which provides a comprehensive view on the status, systems and resources in place to support energy statistics, as well as key challenges or gaps that must be addressed to improve national energy statistics and align with the International Recommendations for Energy Statistics (IRES) standards. The diagnostic report is delivered together with the action plan for each country.
- **Action Plan** for each country, which defines a strategy and a five-year roadmap to improve or establish a NEIS, and identifies the necessary human, financial and technical resources to support the strategy, with specific, costed solutions.
- **Training sessions** designed to address common themes identified in the diagnostic phase and to fill specific skill gaps for National Focal Points to facilitate the implementation of the strategy and action plan to establish or reinforce a NEIS. The online training courses were held in English and in French and trained in total 32 experts from focused countries. Recordings can be made accessible upon request.
- **Technical validation workshop** held in Addis Ababa, Ethiopia in September 2022, gathering representatives from each participating country, to provide technical validation and peer feedback on the diagnoses and action plans. This workshop also allowed to consolidate a community of practice and networking opportunities.
- **A Ministerial Meeting,** plan for the beginning of 2023, with the aim to discuss the implementation of the action plans and highlight the gaps and short falls which need to be addressed, including financing and to discuss the role of support from AFREC and other international organization to effectively improve the NEIS.

Key findings and perspectives

The diagnostic process revealed several common challenges faced by almost all focused countries with varying degrees:

- Biomass and energy end-uses (in particular for oil products), are the two key areas where focal points struggle to obtain sufficient data for energy balances.
- Energy efficiency statistics are often at a nascent stage or non-existent.
- Financial, material and human resources are often lacking.
- Energy statistics systems are often dependent on the knowledge of one or several core staff members with no or few measures in place to help manage turnover in the team or onboard new hires.
- Stakeholder sensitization and data governance clarification is required to improve data collection and working relationships with partner institutions.
- Sustainability of IT systems/hardware is a key risk for NEIS, given limited internal capacity and resources to maintain IT systems over the long run.
- Limited dissemination of energy statistics mainly due to limited knowledge on data analysis, lack of resources, and lack of clear request for analysis from decisionmakers.

In light of these outcomes, recommendations and action plans for the 10 participating countries were gathered in a "Diagnostic Report and Action Plan". As the full report contains sensitive data, this report, made for public dissemination, summaries each country's diagnostic and action plan to serve as a prospectus for fund-raising or consensus building to reinforce or establish the NEIS.

DIAGNOSTIC REPORT AND ACTION PLAN FOR THE FEDERAL REPUBLIC OF NIGERIA

The Federal Republic of Nigeria is a West African country that covers 923,700 km^2, Nigeria's 2020 population is estimated at 206.1 million people according to UN data, making it the seventh most populous country in the world. Nigeria is a member of the African Union. Nigeria overtook South Africa in 2014 and became Africa's largest economy.

Energy Commission of Nigeria

Nigeria relies heavily on oil as its main source of foreign exchange earnings and government revenues. In 2018, Nigeria topped the list of countries in Africa that produced crude oil. However, Nigeria's refining capacity is currently insufficient to meet domestic demand, requiring the country to import petroleum products.

Biomass (wood fuel and charcoal) is the major energy source in Nigeria; 95% of this biomass was used by households according to AFREC's statistics 2018. Biofuels and waste took a considerable share in the total final consumption of the country taking up to 88%. However, considering the fragmentation of uses at individual level there is a major lack of knowledge and information due to poor data collection.

Nigeria's most recent energy balance statistics dates from 2018, the total primary energy supply for Nigeria was 224.45 Mtoe while total final consumption reached 176.73 Mtoe.

Most of the electricity is generated from Fossil thermal (62%). The rest is mainly generated from hydropower. The electricity generated is mostly used by households at 57%, followed by Commercial and Public Services (27%) and by the industry sector at 16%. According to its National Renewable Energy Action Plan (2016), Nigeria targets 29% of its electricity production from renewables by 2030, including large hydro (19% in 2020), with 13.8 GW of capacity.

Looking at final energy consumption, 56% is used by household's, 21% by transport sector and 14% by Industry.

The **National Energy Information System (NEIS) Diagnostic Report and Action Plan** was developed with the support of AFREC and in close collaboration with the AFREC National Focal Points (NFPs) and the Energy Commission of Nigeria (ECN).

This report summaries (1) the diagnostic of energy statistics in Nigeria, (2) specific recommendations to improve energy statistics and reinforce or establish a NEIS, (3) top priority short- and long-term actions, and (3) a high-level action plan with the resources and timelines required for implementation of the recommended actions.

1. Results of the diagnostic

The Energy Commission of Nigeria (ECN) has an Energy Information System (EIS) directorate. Operationally, energy statistics are managed by the directorate. The EIS directorate of ECN collects data from public entities in particular The National Bureau of Statistics (NBS), ministries, parastatal companies and, to a more limited extent, the private sector, and distributes statistics and indicators, as well as analytical reports both internally and to a number of international organizations. Currently the EIS directorate distributes data through a web platform. The table below describes the primary characteristics of Nigeria's energy statistics program as identified during the diagnostic assessment.

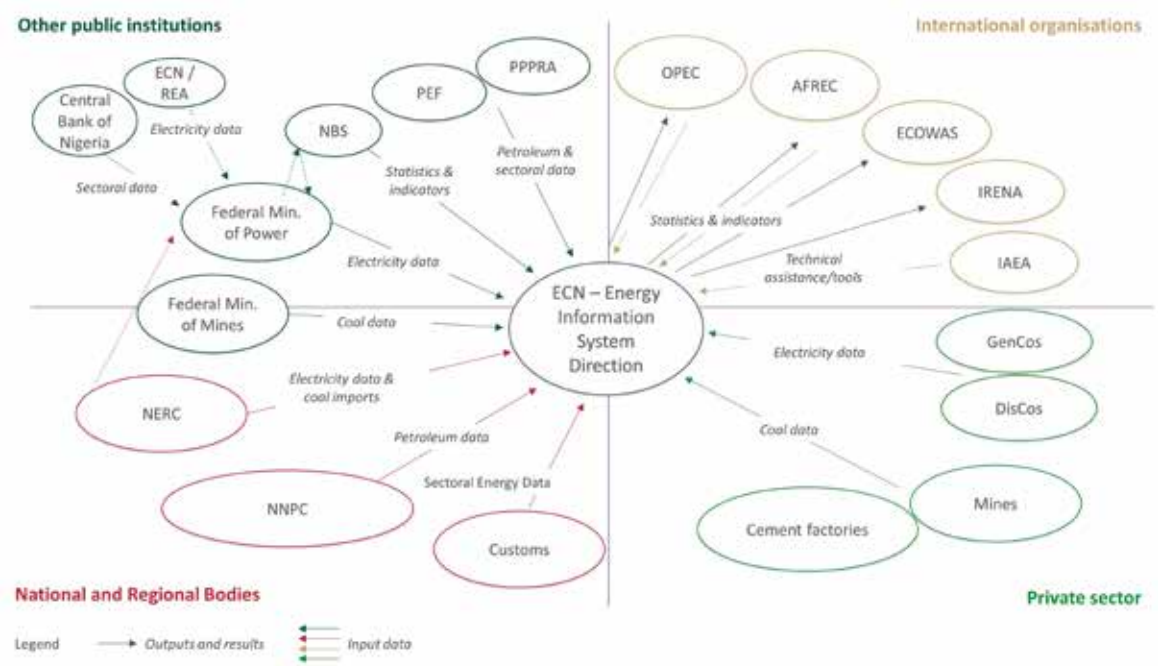
Item	Diagnostic results
Institutions and legal environment	• The National Bureau of Statistics (NBS) is the main national agency responsible for the development and management of official statistics • The Energy Commission of Nigeria (ECN) has the statutory mandate for the strategic planning and coordination of national policies in the field of energy in all its ramifications. • The National Consultative Committee on Statistics (NCCS) comprises the main data suppliers, and its role is to support and oversee the generation and validation of energy statistics on an annual basis
Human and material resources	• ECN has deployed a specific team working on energy statistics, composed of 3 thematic groups and IT support and a total of 15 members full-time dedicated to energy statistics • The National Energy Data Base (NEDB) platform is being developed in house on an MySQL platform • Statistics officers are comfortable with petroleum, coal and electricity subsectors through the Energy Balance processes; however, they have less experience with biomass, other renewable energies and energy efficiency statistics are still at a nascent stage.
Data collection	• The EIS direction does not report any substantial difficulties in obtaining key data for petroleum, gas, coal and the electricity sector. Consumption by end-use is more challenging to estimate with limited information and surveys. • Data regarding biomass energy is not systematically collected or generated in Nigeria, and few inputs exist to assist in making reasonable estimations about their use
Data processing	• Since 2019, two tools from OPEC and AFREC are used to compile energy statistics. Both tools are structured Microsoft Excel files with linked dedicated worksheets for raw data, calculations and outputs, • The National Energy Data Bank, is used among others to track data on petroleum products. The Nigeria Energy Calculator 2050 (NECAL 2050) is another tool used to inform the country's Nationally Determined Contribution (NDC) and ENERGIS – a GIS tool on energy infrastructure is being developed internally.
Quality assurance and validation	• Quality assurance and data validation is managed through internal checks and the organisation of stakeholder's validation workshops and National Committee oversight
Dissemination and analysis	• Dissemination of data to the public domain is made through the publication of datasets on the National Nigeria Energy Databank • Statistics officers have highlighted a need for additional training on data management, data visualization tools and energy economics basic knowledge in order to improve the quality and level of detail of the team's analytical output.

Summary of the main results of the diagnostic assessment

The Energy Commission of Nigeria (ECN) has the statutory mandate for the strategic planning and coordination of national policies in the field of energy in all its ramifications. It is the apex government organ empowered to carry out strategic planning and coordination of national policies in energy in all its ramifications, to collect, analyse and publish information relating to the field of energy from all sources. It also makes recommendations for the exploitation of new sources of energy to the government. ECN is headed by a Director General/CEO. It has, amongst other departments, a department of Energy Information System (EIS) headed by a Director, who is responsible to the Director General/CEO.

Nigeria has developed its own National Energy Data Bank. Dissemination of data to the public domain is made through the datasets available on the National Nigeria Energy Databank (https://databank.energy.gov.ng). It contains the main energy statistics (petroleum products, coal and electricity), energy balance, links for energy laws and policy, and socio-economic indicators. However, datasets are not systematically published and lack some additional analysis outputs, that may prevent data from being used more widely. For data collection and validation, a well-organised committee on Petroleum Statistics already exists and should be replicated for other subsectors, including Electricity and Renewable Energies.

The primary weaknesses highlighted in the diagnostic relate to the quality and availability of biomass and energy efficiency data, which poses a threat to the accuracy of the energy balance statistics as a whole by presenting a biased vision of the country's energy system. Currently, for example, supply and demand data for biomass is only estimated; however, ECN is currently working on completing household surveys on biomass use in three geopolitical zones, with additional coverage for the surveys planned. The other major weaknesses relate to the statistical Excel infrastructure which does not allow time series, generating a high workload of repetitive, low-value added tasks for the energy statistics team. Training on data management, energy statistics and energy economics would provide additional skills to the EIS team to help address the aforementioned issues.



Institutional environment

2. Recommendations

The diagnostic assessment concludes with four main recommendations to reinforce energy statistics in Nigeria to align with international recommendations and establish a NEIS:

1. Improve data quality and coverage

- **Improve critical sub-sector data for biomass and renewable energy**: accessing funding to finalize the ongoing biomass household surveys is a top priority, as is inaugurating the Consultative Committee on Renewable Energy Statistics to ensure regular provision and oversight of renewable energy data, including biomass.
- **Develop data inputs for energy efficiency analysis** and should be supported by strong training for the EIS Team.
- **Reinforce data collection from existing sources**: work with CBN and NBS to add or adapt questions on energy to quarterly household or enterprise surveys, and with Distribution Companies to improve knowledge regarding electricity end-uses.
- **Improve and expand quality checks** by replicating quality check procedures of petroleum sub-sectors to other subsectors, notably renewable energies.

2. Increase the analytical component of the statistical work

- **Develop capacity on data management**: all members of the team should receive basic training on best practice and techniques for data management to allow the statistics team to manage ever-larger and more complex data sets with various data sources to manage and aggregate.
- **Complete the existing "National Energy Data Bank" statistical infrastructure** to (1) reduce repetitive work as much as possible for team members (2) integrate data for all relevant energy sub-sectors in Nigeria, including renewable energy and energy efficiency metrics and other key indicators.

3. Structure and facilitate data dissemination

- **Finalize the development and launch the National Energy Data Bank web platform** and launch the Data Bank web platform for public dissemination.
- **Publish regular analytical reports and develop the document ECN library** for building out a more ambitious program of dissemination focused on the publication of an annual report and thematic analytical reports on key issues related to the energy sector.
- **Build capacity on energy economics and data analysis to expand the analytical output of the team** in using energy statistics to generate analytical output (sectoral policy analyses, forecasts, etc.) in support of policy making or public debate outside of contribution to specific ECN projects.

4. Perpetuate and formalize energy statistics processes

- **Strengthen the energy statistics process with increased collaboration with NBS**: while ECN has an institutional mandate to generate energy statistics it would be interesting to increase the collaboration between ECN and NBS. This process is currently underway, with the recent secondment of statistics staff from NBS to ECN to improve links between the two organizations and capacity on statistics and conducting surveys.
- **Review and evaluate** statistics process, outputs, and training needs on a regular basis.

3. Priority actions

The action plan covers a period of five years to achieve the recommendations and establish a fully functional NEIS aligned to the extent possible with international recommendations and best practice. The plan comprises of 33 prioritized actions spread across four implementation phases over the period 2022- 2026.

While many actions can be achieved by the existing team with few additional resources, the implementation of the full action plan is expected to require approximately US$ 378,500 in financial resources to implement. These costs are primarily service costs to make improvements to the statistical infrastructure and tools and to carry out surveys to collect primary data on biomass consumption and other energy end uses, notably for petroleum products.

Nigeria has identified the following «quick win» items - or actions that will have significant impact with minimal resources - as top priority over the coming 12 months:

- **Train statistics officers** (Actions 1A.1 and 3B.1): Train the statistics team on biomass and renewable energy sectors, and on data analysis and data visualization techniques,
- **Create consultative committees** (Action 1A.2): CCRES (Consultative Committees on Renewable Energy Statistics) to be launched by ECN and lobbying Ministry of Power to establish consultative committee on Power Statistics,
- **Work with NBS and CBN to identify priority indicators for inclusion in quarterly surveys** and determine how best to include this data in ongoing household or enterprise surveys.

Nigeria has also identified the following structuring projects, which require more substantial resources and planning than the quick win actions, as highest priority in the coming 24-36 months:

- **Improve biomass data through surveys** (Action 1A.6): conduct comprehensive biomass surveys for outstanding geopolitical zones in Nigeria at an estimated cost of US$ 210,000,
- **Specification of improvements to be added in the Energy Data Bank, in particular for data visualization and analysis**

4. Five-year action plan to establish a NEIS

PHASE 1:
Plan finalization & preliminary adaptations (H2 2022)

- Finalization and dissemination of the action plan
- Participation in the AFREC training program
- Implementation of initial «quick win» actions to onboard the team, improve (biomass) data collection from existing secondary sources for the next statistics cycle
- Work with NBS and CBN to identify and add relevant energy questions

PHASE 2:
Consolidation of quick wins and preparation of long-term projects (H1 - H2 2023)

- Formalization of collaboration with NBS and ECN
- Implementation of expanded quality assurance processes
- Launch of dissemination activities with publication of reports and dataset on a regular basis on the National Energy Data Bank platform

PHASE 3:
Implementation of long-term projects (H1 2024 - H2 2025)

- In-depth training on data management and energy economics for team focal points
- Launch of biomass and energy end use surveys, integration of improved data
- Full adoption of improved processes and quality checks

PHASE 4:
Monitoring and update (H1 2026 and beyond)

- Monitoring the effectiveness of adopted processes and tools
- Adaptation and update where required
- Expansion of dissemination activities
- Implementation of remaining opportunistic improvements

Action plan overview with phases and primary activities

NEIS & Capacity Building for 11 Member States
Executive Summary of the Diagnostic Report and Action Plan for The Federal Republic of Nigeria

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AFREC is a specialised energy agency of the African Union mandated to develop the African energy sector by coordinating, harmonising, protecting, conserving, developing and promoting rational exploitation, commercialization and integration of energy resources in Africa. Working with African Union member states with a broad network of experts and partners in all the 55 African countries, we ensure all energy initiatives responds to the future development of the African energy sector, in our pursuit to build 'the Africa We Want'.

Comments on the report are welcome and can be sent to:

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