



AFRICAN UNION



ENERGY

African Energy Commission
Commission Africaine de l'Energie



Ministry of Energy



Republic
of Kenya



AFRICAN ENERGY COMMISSION (AFREC)

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

DIAGNOSTIC REPORT AND
ACTION PLAN OCTOBER 2022



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FOREWARD

I am delighted to present this diagnostic report and action plan for the development of the Kenya's 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 improve or establish the 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 Ministry is cognisant of the need to improve Kenya's energy data collection methods by setting up systems which respond to the country's data needs to include all sectors of the economy, to improve energy data quality and coverage. Development of the NEIS is a necessary and critical tool to assist the country to conduct energy programming better, improve government efforts for better planning, policy making as well as making informed decisions related to the country's energy sector transformation.

The diagnostic report reveals a number of challenges, such as insufficient data for energy balance especially biomass, low quality data, few skilled human resource capacity to process data and inadequate statistical infrastructure to manage data. This report therefore cultivates a route to the establishment of the NEIS.

Noting the implication of the cited challenges, it is important to acknowledge the need of providing a direction to ensure our people enjoy access to energy security and subsequent high quality of life of which credible data forms an integral part of the process. Kenya's energy resources is poised to contribute to socioeconomic development and social justice for our people and an efficient data management system such as NEIS is key to this goal.

It is therefore imperative that our project designs, policies and strategies are informed by high-quality and reliable energy data that provide a realistic diagnosis for human and economic needs. We shall also take cognizance of the impacts and challenges of climate change, which continues to pose significant threats to economic and social development of our country and across the world over.

As a Ministry, we believe that the AFREC's support on the development of the NEIS will help the Kenyan Government to increase the quality of energy statistical processes, which are critical for designing good energy strategies for investment. 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 to further prepare us to manage the system effectively and address national, regional and continental needs.

Davis Chirchir
CABINET SECRETARY
MINISTRY FOR ENERGY AND PETROLEUM

COMMISSIONER'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 from 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.

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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.

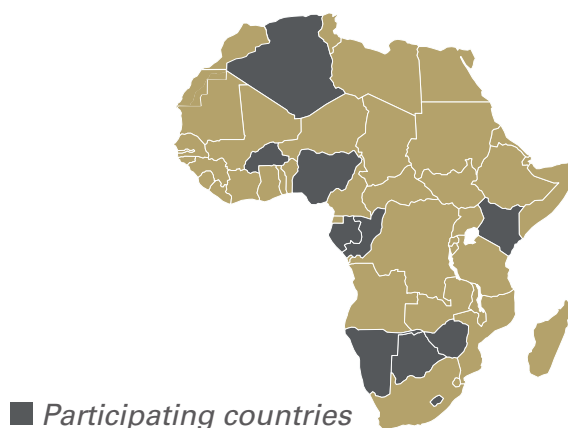
The specific objectives of the project are threefold:

- **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



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 REPUBLIC OF KENYA

The Republic of Kenya is a country in Eastern Africa with a population of more than 47.6 million in the 2019 census. Kenya is a member of the African Union. As of 2021, Kenya was the third-largest economy in sub-Saharan Africa after Nigeria and South Africa.

The following estimates and ratios are taken from the data directly provided to the AFREC AEIS platform for 2018. **Biofuels and waste still account for the large majority of primary energy production (74%)**, followed by geothermal with an increasing share from 12 to 26% between 2010 and 2018.



Ministry Of Energy, Kenya

Kenya is one of the few countries to significantly develop geothermal energy. The sources of electricity generation are from a variety of sources such as geothermal, hydro-electricity, solar/wind and fossil thermal. The share of geothermal energy source has been increasing tremendously from 2000 to 2018. Geothermal provides the largest share at 51% followed by hydro power at 40%, fossil fuels at 5% and wind almost 4% of the total electricity generated.

Electricity is mainly consumed in the industrial sector at 53%, households at 29%, and commerce & public service at 18%.

The main sources of biomass for Kenya include charcoal, wood-fuel and agricultural waste. Households have large share of biofuels and waste consumption at 82%, followed by commerce and public sectors.

Final energy consumption is largely based on households' consumption (58%), followed by transport sector (20%), and commercial & public services (13%), whose share has significantly increased in recent years.

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) within the Ministry of Energy (MoE) and Kenya National Bureau of Statistics (KNBS).

This report summaries (1) the diagnostic of energy statistics in Kenya, (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

Kenya does not currently have a NEIS, and lacks a data unit and tools in MoE to regularly produce energy statistics; as this role is currently filled by KNBS. The table below describes the primary characteristics of Kenya's energy statistics program as identified during the diagnostic assessment.

Item	Diagnostic results
Institutions and legal environment	• KNBS is mandated by law in the Statistics Act 2006 for collection, compilation, analysis, publication and dissemination of statistical information, and the co-ordination of the national statistical system, including in the energy sector • Collaboration between KNBS, MoE and other stakeholders organized informally through appointed focal points and a Technical Working committee which convenes to review and validate statistics outputs • Data initiatives across MoE, Semi-Autonomous Government Agencies (SAGAs) and KNBS are not highly coordinated and should be streamlined.
Human and material resources	• MoE currently has limited capacity and no dedicated team for energy statistics or data; the team should be strengthened with additional statistician/ economist profiles having a background in statistics or social sciences • Additional training is required to reinforce capacity on biomass and energy efficiency sub-sectors, data management, and energy economics and analysis at both KNBS and MoE • Material resources are still limited to produce energy statistics
Data collection	• Data collected by KNBS through focal points in various organizations mostly public / Semi-Autonomous Government Agencies (SAGAs) and through the recently established National Committee on Energy Statistics • MoE uses data mostly taken from KNBS publications or collects data from stakeholders on an ad hoc basis • Data sources are not obligated by law to transmit data to KNBS, but the organization has strong connections and a robust collection system in place • Limited biomass data is collected or estimated at this stage constituting a major weakness in the overall statistics
Data processing	• Data is processed by KNBS using United Nations Statistics Division (UNSD) template on Excel files. MoE translates KNBS published outputs into AFREC format using the AFREC template. • There is no additional statistical infrastructure at KNBS or at MoE. UNSD template used by KNBS does not allow for the generation of all required indicators
Quality assurance and validation	• Meetings with key data sources, and validation meetings with the Technical Working Committee are under creation by KNBS • Limited tracking of reference metadata by KNBS or MoE
Dissemination and analysis	• Limited knowledge on energy economics/planning in both organizations • KNBS distributes information to the general public through regular publications • KNBS participates in the steering committee of some projects at MoE, but MoE has difficulty storing and tracking data for use in its initiatives - data is collected from scratch with each new project, with little or no use of existing collection channels through KNBS or the technical committee • No analytical outputs or publications from either organization

Summary of the main results of the diagnostic assessment

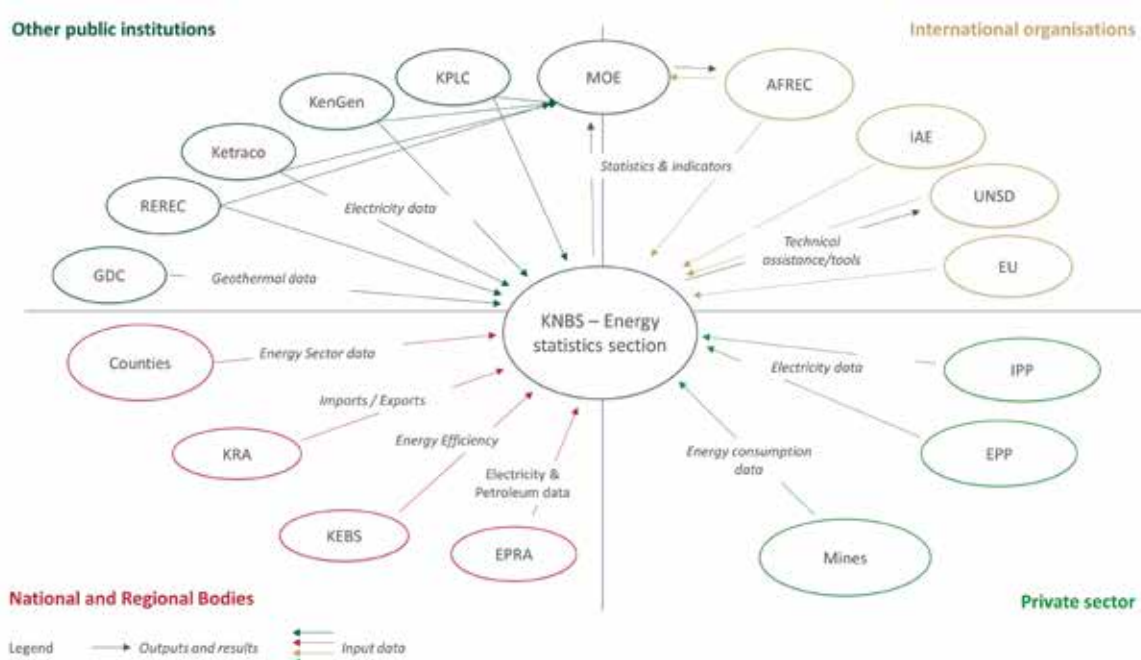
KNBS has good capacity for data collection, compilation and dissemination of energy statistics: it has two full-time statistician profiles in its team and a strong legal mandate for collecting data, constituting a core strength on which Kenya can build. **An improved**

cooperation between KNBS and MoE is therefore encouraged to host the NEIS. The newly created Energy Statistics Committee should play a key role in data validation and quality assurance going forward.

The major weaknesses relate to the absence of sufficient statistical infrastructure: the Excel template currently used by KNBS does not allow for tracking of time series or the calculation of all relevant indicators for energy sectoral analysis, and is notably not accessible to users at MoE, limiting collaboration between the two organizations. Other weaknesses highlighted in the diagnostic relate to the quality and availability of biomass 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. Finally, **limited capacity for data analysis, storage and tracking at MoE limits the organization's potential both to collaborate with KNBS effectively and consistently use data for decision-making and monitoring of key policies or projects**, as well as for producing pertinent analytical outputs that fall outside the scope of KNBS.

Ultimately **high-level energy statistics on consumption, transformation and supply at the national, sectoral or sub-national level should remain the responsibility of KNBS**, building on the systems and processes already in place. MoE should expand and systematize its collaboration with KNBS to ensure a strong two-way flow of information and inputs between the organizations regarding these statistics. In addition to this coordinating role, MoE should retain responsibility for and develop capacity to manage, store, use and disseminate more detailed data required in energy planning and policy assessment processes (infrastructure locations/characteristics, planning data sets on electricity demand, technology costs, etc.) that falls outside the remit of KNBS.

To this end, **it is strongly suggested that MoE set up a dedicated data unit that would be responsible for coordinating collaboration with KNBS energy statistics teams and the National Committee on Energy Statistics**, coordinating with outside organizations such as AFREC, collecting and managing planning data, and developing analytical output for Ministerial level and public dissemination.



Institutional environment

2. Recommendations

The diagnostic assessment concludes with five recommendations to reinforce energy statistics in Kenya to align with international recommendations and establish a NEIS:

1. Streamline and enhance cooperation MoE - KNBS

- **Set up a data unit in MoE linked to the planning team** – with at least one economist/statistician and one data manager/IT expert (2 FTE).
- **Streamline participation in data activities at MoE**- MoE data unit team should lead the institutional collaboration on data issues with both KNBS and SAGAs.
- **Strengthen links with KNBS** by including them systematically in MoE project steering committees, data-related activities and in AFREC meetings/projects.

2. Improve and expand data collection through KNBS

- **Support the development of the National Energy Statistics committee** to ensure effective and sustainable participation from organizations both within the energy sector and with mandates on related subjects (trade, forestry and transport).
- **Improve data collection on biomass supply and demand** with the implementation of a national survey covering both households and enterprises.
- **Improve data collection for end uses, in particular for petroleum products**, by adding/adapting questions on energy to the KNBS households or enterprises surveys.

3. Adapt Statistical Tools to the Requirements of a NEIS

- **Develop capacity on data management:** through training on best practices and techniques for data management of the KNBS and MoE teams.
- **Elaborate a tool for KNBS to facilitate compiling and tracking statistics**, including visualization and analytics. Technical management of the tool should be housed in KNBS and accessible to MoE for an improved cooperation.

4. Structure and facilitate data dissemination

- **Publish specific energy reports** (prepared by MOE with support from KNBS) and distribute to public audience.
- **Raise the profile of energy statistics by holding an annual national workshop** to present the Energy Balance and headline statistics for energy.
- **Build capacity on energy economics and data analysis** to expand the analytical output of the team.

5. Perpetuate and formalize energy statistics processes

- **Formalize the energy statistics mandate:** to formalize and clarify the role of MoE with respect to energy data with a law or a decree.
- **Ensure continuity in statistics activities with written processes and user manuals:** The Draft Energy Statistics guidelines should be finalized.
- **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 30 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\$ 360,000 in financial resources to implement. These costs are primarily service costs to make improvements to the statistical infrastructure and tools.

The plan also identifies approximately US\$ 1000 in annual recurring costs, primarily to cover the cost of holding annual data validation and dissemination/sensitization workshops, as well as printing costs to support dissemination. Additional human resources are also potentially required to support the development of a NEIS in Kenya.

The following «quick win» items or actions identified by Kenya will have significant impact with minimal resources -as highest priority over the coming 12 months:

- **Streamline and enhance cooperation between MoE and KNBS:** Including KNBS systematically in MoE project steering committees and other data activities,
- **Support continued meeting** and active participation of stakeholders in the National Committee on Energy Statistics

Among others, Kenya 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 a National Survey:** Conduct a comprehensive biomass study to collect primary data on supply transformation and use in household, commercial/service and other sectors at an estimated cost of US\$ 150,000,
- **Select and train 1-2 members of the team** in more advanced statistics energy economics and analytical methodologies.

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 improve data collection on biomass and energy efficiency
- Incorporate informal energy use in our quarterly household survey, pending availability of funds
- Strengthen links between KNBS and MoE for improved collaboration

PHASE 2:

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

- Formalization of collaboration between MoE and KNBS with MOU or legal mandate
- Training on data management for statistics team
- Launch of dissemination workshop
- Planning and resourcing for the design of the energy statistics tool, national surveys, and MoE data unit

PHASE 3:

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

- Set up and training of MoE data unit
- Statistical infrastructure development, testing, and implementation
- Full integration of improved data from national Surveys
- Full adoption of updated processes and infrastructure

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 with analytical outputs from MoE
- 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 Republic of Kenya

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

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An active geothermal well at Eburu in Nakuru, Kenya



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