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 Ministry of Mines and Energy of the Republic of Namibia
DEVELOPMENT OF THE NATIONAL ENERGY INFORMATION SYSTEM (NEIS) AND CAPACITY BUILDING PROJECT

DIAGNOSTIC REPORT AND ACTION PLAN
OCTOBER 2022
I am delighted to present the diagnostic report and action plan for the development of the Namibia’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 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 establishment of the Namibia National Energy Information System (NEIS).

The Ministry is cognisant of the need to improve Namibia’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. The development of the Namibian NEIS is a necessary and critical tool in achieving this goal, which can enable us as a country 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.

Noting the implication and challenges of lack of data in general, it is also important to acknowledge that providing a direction to social justice of our people and ensure they have access to energy security and a quality of life, quality data forms an integral part of that process. Hence, not discounting the impacts and challenges of climate change, which continue to pose significant threats to economic and social development in our country and across the world, Namibia’s energy resources shall contribute to Namibia’s socio-economic development and social justice of our people. However, this can only be done if our project designs, policies and strategies are informed by high-quality and reliable energy data and provide a realistic diagnosis for human and economic needs.

As a Ministry, we believe that the AFREC’s support on the development of the NEIS will help the Namibian Government to increase the quality of the energy statistic 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, which will further prepare us to manage the system effectively and address national, regional and continental needs.

Hon. Tom Alweendo, MP
Minister Of Mines and Energy, Namibia
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.
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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 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.
The Republic of Namibia is a Southern African country that covers 826,000 km² and is populated by an estimated 2.6 million people as of 2020. Namibia is a member of the African Union and also a member state of the United Nations (UN), the Southern African Development Community (SADC), and the Commonwealth of Nations.

Namibia’s energy sector comprises electricity, upstream oil and gas, and downstream liquid fuels subsectors, as well as the less structured downstream gas and biomass energy subsectors.

In 2018, the total primary energy supply for Namibia was 2.94 Mtoe while the final energy consumption is 2.7 Mtoe. Energy production in Namibia is dominated by imported oil and oil products, and then domestic biomass.

Namibia’s energy consumption is dominated by petroleum products which accounted for some 56% of all energy consumed in 2018, while electricity accounted for some 13% and biomass for 31%, with apparently no consumption in the form of coal and liquid petroleum gas (because data are not tracked). The share of petroleum products in the final consumption is very high relative to peer countries, and may result from a lack of sufficient data on petroleum products and, most importantly, on consumption of biomass in the residential sector. Throughout the past decade, the country’s total energy consumption grew by some 3% per annum, while electricity consumption has increased by an average annual rate of some 4.1%.

Regarding electricity, Namibia imports are, in average, roughly 60% of its electricity consumption from neighbouring countries. For the remaining part, electricity generation has been dominated by hydroelectricity (90%) complemented by coal (Van-Eck) Heavy Fuel Oil (Anixas), Wind and solar PV power plants.

From a sectoral perspective, Namibia’s energy statistics show a strong share of transportation and residential in final consumption. Industry consumption, by contrast, is very low with respect to peer countries, likely a result of partial or estimated data on petroleum, electricity and biomass end uses and limited data collection on behind-the-meter self-generation of electricity in the industrial sector.

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) at the Ministry of Mines and Energy (MME) and members of Namibia Statistics Agency (NSA) and Electricity Control Board (ECB).

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

Namibia does not currently have a NEIS, several entities have collected energy-related data in the past, but these initiatives were mostly insular and non-systematic. The energy statistics process is a work in progress in Namibia; MME uses AFREC’s questionnaires to generate energy balance statistics, ECB works with its internal excel database to generate statistics related to electricity and NSA is not yet involved in this sector. The table below describes the primary characteristics of Namibia’s energy statistics program as identified during the diagnostic assessment.

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<th>Item</th>
<th>Diagnostic results</th>
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| **Institutions and legal environment** | • The MME is not acting under an official mandate and there is confusion between the roles and activities of the MME, NSA and ECB, and in some points, they collect the same data.  
    • Collaboration with other stakeholders organized informally with a need to identify and engage with additional institutions to support data/statistics development particularly for electricity end-use consumption, petroleum products (including LPG) and biomass. |
| **Human and material resources** | • In the MME, the personnel allocated to energy statistics is insufficient to conduct all the work on energy statistics in terms of available time and skill, thus the team focuses on data collection while data processing and analysis are left out.  
    • Additional training is required to reinforce capacity on biomass sub-sector, energy efficiency statistics, data management, and energy economics and analysis  
    • Material resources are sufficient given improvements to the internet connection |
| **Data collection** | • Data collected through Nampower, Electricity distributors, customs and other divisions of the Ministry, difficulty in having end-uses data.  
    • Data quality is limited for petroleum products  
    • No biomass data is collected or estimated  
    • There are no formal institutional agreements that bind the data suppliers to provide data to the MME |
| **Data processing** | • There is not an existing tool used to compile energy, the current web software in development does not allow for data processing.  
    • Both institutions, MME and ECB, generate electricity statistics. |
| **Quality assurance and validation** | • Internal checks are not achieved following a specific methodology, only on an ad hoc basis. The MME relies on checks in AFREC questionnaire to identify potential errors.  
    • Additional checks are required to monitor compliance with international standards and verify/track the validity of estimated values |
| **Dissemination and analysis** | • Limited knowledge on energy economics/planning methodology among MME officials, limits the team’s capacity to enhance analysis by interpreting trends or data, or make effective use of available planning tools  
    • No public dissemination |

Summary of the main results of the diagnostic assessment

The willingness and engagement of the MME officials together with a strong commitment to develop energy statistics from the hierarchy in the MME is the major strength of the nascent energy statistics program in Namibia.  
The primary weaknesses highlighted in the diagnostic relates to the institutional environment and the absence of collaboration between the institutions managing energy statistics. The diagnostic points to a need to continue improving the collaboration and information sharing between the three institutions managing statistics and energy data (MME, ECB, NSA) including role clarification.
The other major weakness relates to the **insufficient human resources and expertise within the MME to conduct all the work on energy statistics**. The officials highlighted a need for additional training on specific energy sub-sector, as well as on energy efficiency indicators. This is also a need for ECB and NSA members should those institutions be involved in an effective NEIS. Should the MME include energy balance calculation and generation of energy reports, training in advanced energy economics and energy balance methodology may also be of use to permit team members to develop for higher value-added activities like analysis and reporting.

There is also an important issue regarding data quality. In fact, **data for petroleum and biomass, end uses of all types and energy efficiency is not collected or of poor quality**. Consequently, there is a need to increase engagement with institutions that currently partially participate (ECB, Regional Electricity Distributors, Local Authorities, Bank of Namibia), or do not participate (customs, mines, biomass-based industry and associations), to the data collection and dissemination. Institutional outreach would support the continued development of data collection particularly where end use electricity consumption, petroleum products end uses, energy efficiency statistics, and biomass data are concerned. Secondly, **data quality could be improved with consumption surveys critical sub-sector, biomass and petroleum**.

Finally, another weakness relates to the **software infrastructure which is currently being developed, which is being developed without a clear roadmap or prioritization of functionalities**. Currently, the tool is designed only to collect and store data with a labour-intensive process and does not allow for data processing or reporting. In the objective of designing an efficient statistical infrastructure able to generate energy balance and key indicators, first of all there is a need to develop capacity on data management and data processing. Then, it will be required to identify the key requirements for an infrastructure design and develop functional specifications before investing more time in the tool being developed.

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**Institutional environment**
2. Recommendations

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

1. Set up an effective institutional environment
   - **Set up an inter-institutional statistic working group with MME, ECB and NSA** to review and allocate data collection and processing to the different institutions.
   - **Implement a statistic team in the MME dedicated full time to energy statistics** to conduct a relevant work on energy statistics including data collection, analysis, report writing & dissemination.

2. Improve data quality and coverage
   - **Improve critical sub-sector data for biomass, petroleum**, through training, outreach to new stakeholders to improve secondary data collection, as well as investments in consumption surveys.
   - **Reinforce data collection from existing sources** for electricity and coal by working closely with ECB, NSA and other key data providers to expand the data shared or to introduce low-cost changes to their collection methods.
   - **Develop data inputs for energy efficiency analysis** in collaboration with AFREC.
   - **Set up a Technical working group with the principal data providers** to support and oversee the generation and validation of energy statistics on an annual basis. Focal points will be responsible for assisting the inter-institutional statistics working group in the data collection process and for participating in data validation meetings.

3. Adapt Statistical Tools to the Requirements of a NEIS
   - **Develop capacity on data management and data processing** through training of designated focal points and 1-2 members for more in-depth training on database management and tools in order to anticipate potential changes in the statistical infrastructure.
   - **Engage the next phase of the existing statistical infrastructure development** to (1) reduce repetitive work as much as possible, (2) integrate already processed electricity data and statistics generated (3) integrate data for all relevant energy sub-sectors (4) provide energy balance tables and other key indicators as an output.
   - **Improve and expand quality checks** to include all relevant stakeholders in the validation processes, and employ advanced data quality checks to verify estimations and ensure alignment with international standards.

4. Structure and facilitate data dissemination
   - **Build capacity on energy economics and data analysis** to establish the foundation for the analytical output of MME’s Statistics team.
   - **Publish an annual report and dataset** for public dissemination building on the internal reporting already in place.

5. Perpetuate and formalize energy statistics processes
   - **Formalize the energy statistics mandate** on the basis of the arrangements made between the three responsible institutions.
   - **Formalize the institutional relationships and data sharing arrangements** with partner institutions.
   - **Ensure continuity in statistics activities** with written processes and user manuals.
   - **Review and evaluate** statistics processes, 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 52 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$414,000 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$2,500 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. To those costs need to be added the increased in human resources with two full-time officers in the MME, and four full-time in the long-term.

The top priority identified, as an office (MME) is on establishing a workable system for the institutional environment and tools required to establish a NEIS. Given this assessment, the “quick wins” actions that should be implemented as highest priority from S2 2022 are to:

- **Finalize the creation of an inter-institutional statistic working group** with MME, ECB and NSA and appoint at least two focal points from each institution with the final objective of building an Energy reference system (Action 1.A.1). This action has already started and should not require additional human nor financial resources.
- **Implement a statistic team in the MME dedicated full time to energy statistics** to consolidate and structure the energy statistic internal and institutional environment towards an integrated system in the MME. The Team will be in charge of refining and implementing a roadmap for statistics development at MME to set up the structures and systems correctly, based on this diagnostic and action plan, to guide resource allocation and development of tools and dissemination over the short, medium and long term (Action 1.B.1). This action would require one officer from the actual Division to be dedicated full time to energy statistics together with a full-time assistant, and two other officials with more than 30%, and approximately 10 FTE weeks to develop the roadmap.
- **Train the Statistics Team on biomass sectors to improve understanding of data requirements, sector structure, and potential methodologies for estimation** (Action 2.A.1) to prepare for the structuring action. If possible, train the Statistics Team on petroleum sector (Action 2.B.1) and on energy efficiency (Action 2.E.1).

Implementing these actions will pave the way for the top priority long-term actions that require more substantial resources and planning to be implemented within 24 months:

- **Reinforce Biomass data collection with sample surveys** via a comprehensive bio-energy study (Action 2.A.4). It will require at least 35 FTE weeks, with an estimated cost of US$1,000 conference package for sensitization workshop and US$150,000 for the bio energy study.
- **Disseminating data to proper users** should also be a priority once the team is sufficiently capacitated and equipped. This implies developing a public dataset and report (Action 4.B.1, Action 4.B.2). This would require at least 2 FTE weeks to structure and 4 weeks per cycle of publication with few financial resources for web publishing and estimated US$500 for report printing.
4. Five-year action plan to establish a NEIS

PHASE 1:
Plan finalization & preliminary adaptations (H2 2022)
- Finalization and dissemination of the action plan
- Strengthening the institutional environment
- Participation in the AFREC training program
- Implementation of initial «quick win» actions to improve data collection on biomass, petroleum products and energy efficiency

PHASE 2:
Consolidation of quick wins and preparation of long-term projects (H1 - H2 2023)
- Formalization of collaboration with new stakeholders on biomass, petroleum, coal or EE data
- Launch of dissemination activities
- Planning and resourcing for long-term projects and end-uses consumption surveys

PHASE 3:
Implementation of long-term projects (H1 2024-H2 2025)
- Infrastructure re-design
- Full integration of improved data from surveys and data collection
- In-depth training on data management and energy economics for team focal points
- 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
- 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 Namibia

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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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