

Institutional Arrangements for MRV system in the Energy Sector - Sudan

Initiative for Climate Action Transparency - ICAT

Institutional Arrangements for MRV system in the Energy Sector – Sudan

Deliverable #2

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Table of contents

List of Tables	iv
List of Figures	iv
List of Acronyms	v
Introduction	1
ICAT Overview	1
Scope and Objectives	1
Methodology of the Work	2
Structure of the Report	2
General Overview of Existing Institutional Arrangements	4
Introduction to Institutional arrangement	4
Institutional flow in previous communications	4
Energy Sector Context	5
Identified Gaps by Stakeholders	9
Ministry of Energy and Petroleum	9
Forests National Corporation, Ministry of Agriculture	9
Central Bureau of Statistics	10
Ministry of Industry	11
Electricity Regulatory Authority	11
National Energy Research Centre (NERC)	12
The Proposed Institutional Arrangements	13
The key stakeholders	13
Suggested Institutional Arrangement for Energy Sector	15
Roles and Responsibilities	16

Recommendations	18
References	19
Annexes	20
Annex 1: Form/ Questionnaire	20
Annex 2: Identified stakeholders	24
Annex 3: Summary of the results	25
Annex 4: Meeting with the Central Bureau of Statistics, March, 2023	27
Annex 5: consultative workshop on institutional arrangement for Energy and Transport Sectors	28

List of Tables

Table 1-Summary of the assessment results for the Ministry of Energy and Petroleum	9
Table 2- Summary of the assessment results for the Forests National Corporation (FNC)	9
Table 3- Summary of the assessment results for the Central Bureau of Statistics (CBS)	10
Table 4- Summary of the assessment results for the Ministry of Industry	11
Table 5- Summary of the assessment results for Electricity Regulatory Authority	11
Table 6- Summary of the assessment results for the National Energy Research Centre	12

List of Figures

Figure 1 Organizational structure for institutional arrangement in support of MRV activities (Source: FNC)	7
Figure 2 Organizational structure for institutional arrangements in support of MRV in the energy sector (Source: IRENA)	8
Figure 3- Key components of the institutional arrangement.	13
Figure 4- Organizational structure of the ministry of energy and oil	14
Figure 5- Organizational Structure of the FNC	15
Figure 6- Proposed Institutional Arrangement for the energy sector	16

List of Acronyms

BUR	Biennial Update Report
CBIT	Capacity Building Initiative for Transparency
CBS	Central Bureau of Statistics
CC	Climate Change
COP	Conference of the Parties
CSO	Civil Society Organization
ERA	Electricity Regulatory Authority
FAO	Food and Agriculture Organization of the United Nations
FNC	Forests National Corporation
GEF	Global Environment Facility
GHG	greenhouse gases
HCENR	Higher Council for Environment and Natural Resources (Sudan)
M&E	Monitoring & evaluation
MEAs	Multilateral Environmental Agreements
MPGs	Modalities, Procedures and Guidelines
MRV	Measurement, reporting and verification
MWRIE	Ministry of Water Resources, Irrigation, and Electricity (Sudan)
NAP	National Adaptation Plan
NBSAP	National Biodiversity Strategy and Action Plan
NC	National Communication
NCSA	National Capacity Self-Assessment
NDC	Nationally Determined Contribution
NGO	Non-governmental organization
NLDC	National Load Dispatch Centre
POPP	Programme and Operations Policies and Procedures
QA/QC	Quality assurance/quality control
REDD+	Reducing Emissions from Deforestation and forest Degradation
SCADA	Supervisory Control and Data Acquisition
SCIA	Sudanese Chambers of Industries Association
SEDC	Sudanese Electricity Distribution Company
SEHC	Sudanese Electricity Holding Company
SETC	Sudanese Electricity Transmission Company
SHGC	Sudanese Hydropower Generation Company
SPC	Sudanese Petroleum Corporation
STPG	Sudanese Thermal Power Generating Company
SWOT	Strengths, Weaknesses, Opportunities, and Threats

TOR Terms Of Reference
UNDP United Nations Development Programme
UNFCCC United Nations Framework Convention on Climate Change

Introduction

ICAT Overview

The Initiative for Climate Action Transparency (ICAT) is a global initiative that aims to improve the transparency of climate actions, policies, and support at the national and sub-national levels. ICAT provides guidance, tools, and capacity building support to countries to help them measure, report, and verify the impacts of their climate actions. ICAT has been working with a number of developing countries, including many in Africa, to improve their climate action transparency to provide guidance and tools to help these countries measure and report on their greenhouse gas emissions, as well as the impacts of their climate actions. Additionally, ICAT works with these countries to build their institutional and technical capacity to develop robust and transparent national systems for measuring and reporting on climate action.

At the national level, countries must establish systems for collecting and reporting data on their climate action plans, progress, and results. This includes developing national-level policies and regulations that ensure data accuracy and completeness, as well as establishing systems for monitoring and verifying emissions data. To achieve the desired transparency objectives, the Sudan ICAT project aimed to help to develop an effective institutional arrangement in the energy sector.

Sudan needs to establish permanent transparency arrangements to communicate, report and track data related to the GHG inventory, climate change mitigation and adaptation, progress in the implementation of its NDCs and finally the technological, financial, and capacity building support needed and received. Such arrangements can further be developed benefiting from knowledge exchange and sharing of lessons learnt at national as well as international levels through being actively engaged in the capacity building initiative for transparency (CBIT) global coordination platform. Long-term transparency strategy on actions such as GHGs inventory, mitigation and adaptation is required. In particular, ICAT's guidance on transport and energy sectors in Sudan plays a crucial role in developing climate policies and actions that are more effective, transparent, and aligned with global climate goals.

Strengthen the institutional arrangement for MRV in the energy and transport sectors to improve the transparency and effectiveness of Sudan's climate actions in these sectors is a key objective for the ICAT project. ICAT aims at providing technical support to Sudan to develop comprehensive MRV systems for both the energy and transport sectors.

In the energy sector, ICAT aims at working with Sudan to develop an energy data management system that tracks progress towards the country's clean energy targets align with its NDCs. The system has the potential to provide a comprehensive view of the country's energy production, consumption, and emissions, and helps to identify opportunities for further emissions reductions.

Scope and Objectives

The report starts with institutional mapping exercise to assess the gap against the requirements. This is followed by proposing the new institutional arrangement to achieve the following objectives:

1. To identify and map the key energy related institutions in Sudan in the context of Climate Change mitigation and low carbon development.
2. To improve clarity on institutional jurisdictions, functions, and mandates; across levels of government and civil society to strengthen to support greater transparency.
3. To understand the potential influence and role can be played by key energy related institutions on Climate Change and processes for MRV of policies and actions.

Based on the findings and the identified gaps by stakeholders, this report recommends and suggests institutional arrangements and coordination mechanisms for the energy sector with the purpose of strengthening and enhancing their transparency frameworks.

Methodology of the Work

To achieve the main objective of this assignment (strengthen the institutional arrangements for MRV in the energy sector), two main methods were employed:

The first method was **Desk Review**. Desk review includes reviewing existing literature, reports, and publications related to institutional arrangement for transparency and best practices. This can provide a good understanding of the background, context, and key issues. This include documents such as Handbook on institutional arrangements to support MRV/transparency of climate action and support, Climate MRV for Africa and others were collated and reviewed.

The second approach that was utilized is **Stakeholders' Consultation** through the working group as well as HECNR officials to gather feedback, insights, and perspectives from stakeholders. This was conducted through meeting and workshop and distributing a form that assess the key features for the effective institutional arrangement. The form is tailored to assess the institutional gap and the existing arrangements which can be strengthened for the MRV. Consultation was undertaken based on guiding questions covering the following components and assessment dimensions of the institutional arrangements for the MRV in the energy sector.

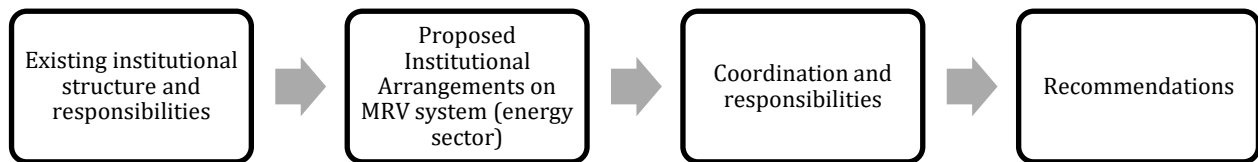
- The overall structure of the institution, overall mandate.
- Responsibility and Climate Change mandate if any.
- Capacity and resource allocated to climate change related activities in terms of both human and financial resources.
- Management Structure and processes that enable the Stability and adaptability of the existing system.
- Authority and the ability to affect the decision making and autonomy within the institution.
- Sectoral Coordination mechanisms with other institutions, both vertical and horizontal.

The key stakeholders across the related line-ministries were consulted. Annexes 1 and 2 are a list of the stakeholders consulted and the form used as well as the summary of the data collected. The consultative workshop report is presented in Annex 5 (for both Energy and Transport Sectors)

Structure of the Report

This report is divided into number of sections; the Introduction, general overview of existing

institutional arrangements in the energy sector, The proposed new institutional arrangement, the roles and responsibilities in the new institutional arrangement, and recommendations for the energy MRV system.



General Overview of Existing Institutional Arrangements

Introduction to Institutional arrangement

The Paris Agreement, adopted in 2015, aims to limit global warming to well below 2°C above pre-industrial levels and pursue efforts to limit the temperature increase to 1.5°C. To achieve this goal, the agreement requires countries to regularly report on their greenhouse gas (GHG) emissions and progress towards their climate targets. This reporting is done through a system called Measurement, Reporting, and Verification (MRV).

The MRV system is a crucial component of the Paris Agreement's transparency framework. It provides a standardized approach for measuring and reporting GHG emissions, as well as tracking progress towards climate goals. The institutional arrangement for MRV involves several key actors:

1. National Focal Point: Each country designates a national focal point responsible for coordinating its MRV activities. In Sudan the national focal point is the Higher Council for Environment and Natural Resources (HCENR)
2. Designated National Authority: The designated national authority is responsible for overseeing the development and implementation of the country's MRV system.
3. Technical Experts: Technical experts provide support and guidance on the development and implementation of MRV systems.
4. Independent Review Teams: Independent review teams are responsible for reviewing countries' GHG inventories and other relevant information to ensure accuracy and completeness.
5. UNFCCC Secretariat: The United Nations Framework Convention on Climate Change (UNFCCC) Secretariat provides guidance on MRV requirements and facilitates the exchange of information between countries.

Overall, the institutional arrangement for MRV is designed to ensure that countries are transparent about their emissions and progress towards their climate targets. By providing accurate and reliable data, the MRV system helps build trust among countries and supports effective global action on climate change.

Institutional flow in previous communications

The Higher Council of Environment and Natural Resource (HCENR) is the leading institution coordinating Sudan's efforts to meet its MRV obligations under the UNFCCC and Paris Agreement. Addressing Sudan's obligations under the UNFCCC is characterized by significant engagement of multidisciplinary teams of scientists, engineers, and planners representing relevant national institutions (i.e., federal ministries, universities, research centers, private sector entities, NGOs and other governmental bodies).

Based on the provisions of environmental legislation passed in 2020, HCENR is chaired by the Prime Minister of Sudan, and has an Inter-ministerial Committee comprised of ministers and heads of national institutions whose mandate includes environmental protection and conservation of natural resources. A proposed new organizational structure for HCENR has been developed, approved and is currently being implemented. The new structure includes 5 General Directorates:

- 1- Policies and Planning;
- 2- Environmental Inspection;
- 3- Sustainable Resources and Environment Protection;
- 4- Climate Change, Desertification and Disaster Prevention; and
- 5- Finance and Human Resources)

In addition to 15 departments/units across those Directorates.

Under the 2020 legislation, the HCENR's Climate Change Unit operates as part of the General Directorate for Climate Change, Desertification and Disaster Prevention. It has five (5) major responsibilities as outlined below.

- Planning, preparation, compilation and submission of the national climate change reports, such as National Communications, Biennial Update Reports, Biennial Transparency Reports, National Adaptation Programme of Action (NAPA), National Adaptation Plan (NAP), Nationally Determined Contributions (NDC), etc;
- Establishment and coordination of the national climate change committee, as well as expert teams on GHG inventory development, GHG mitigation analysis, vulnerability assessment, identification of adaptation strategies, etc;
- Establishment of formal working arrangements and procedures with climate related national institutions and stakeholders;
- Definition and allocation of roles and responsibilities of the different institutions in meeting Sudan MRV obligations; and
- Management of the GHG inventory preparation processes, including technical and institutional capacity building, data collection and archiving, quality controls, technical validation, and the formal government approval process.

During the preparation of the initial and second National Communication, the institutional arrangements related to MRV were established on an ad hoc basis.

Energy Sector Context¹

The energy sector is a crucial sector for Sudan's development, and it plays an important role in the country's efforts to address climate change. Sudan has a high potential for renewable energy, particularly solar and wind energy, and the government has recognized the need to invest in renewable energy to reduce greenhouse gas emissions and address climate change. However, Sudan continues to rely heavily on fossil fuels, particularly oil, for electricity generation and transportation. The use of these fossil fuels contributes significantly to the country's greenhouse gas emissions, which have been increasing in recent years due to economic growth and population growth.

The government during 2011-2018, using its own resources and Arab Funds financing, invested considerably in thermal and hydro power generation and distribution. Investments included Merwe Dam in 2011 (1250 MW), Heightening of Rosiers Dam in 2013 (90 MW), Umdabaker Thermal station - Kosti- in 2016 (500 MW), Upper Atbara and Setiet 2017 (320 MW). Power generation capacity doubled

¹ Based on Sudan First National Communication, Second National Communication, UNSDAF, Communication with Sectoral Focal Point and Intended National Determined Contributions.

in just a few years, rising from around 8,455 GWh in 2011 to 17,064 GWh in 2018. Sudan also utilized excess of supply of electricity in the region by importing electricity from Ethiopia. Despite this development, the ever-growing demand for power regularly exceed supply available resulting in frequent power outage and prolonged voltage brownouts.

There are strong linkages between energy and climate and environment in Sudan. Deforestation, which is estimated to be occurring at a rate 0.84 percent per annum, is driven principally by cutting trees for energy needs. More than half of the population (58 percent) in 2014 depended on firewood and charcoal for cooking, with the associated environmental and health problems. Use of gas dominated energy use in the urban areas (64 percent) followed by use of charcoal (26 percent) while firewood is still by far the domination source of energy for cooking in the rural areas (61 percent).

Although Sudan is rich in wind, with mean wind speeds of 4.5m/s across 50% of the country, but wind energy is not yet developed. Sudan has published a wind atlas in March 2012. Based on this atlas, three areas were identified with a potential to host wind power projects: (1) Jabel Marra mountains, North of Nyala in Western Sudan, (2) Northern Sudan (Dongola), and (3) the Red Sea area. UNDP, Global Environment Fund (GEF) and Ministry of Water Resources in Sudan are conducting initial steps in use of wind energy in Sudan based on the Atlas; they started a wind project in 2015 (design capacity of 200MW).

Sudan has been considered as one of the best countries for exploiting solar energy since its average sunshine duration ranges from 8.5 to 11 hours a day (average daily solar irradiation is 5.8-7.2 kwh/m²) However, Sudan's solar energy achievements so far appear to be very poor. It has no grid-connected solar capacity. Most of the solar technology installations in the country are Photovoltaic (PV) with a total installed capacity of about 2 MW. Approximately half of the installed capacity is associated with the telecommunication industry (e.g. remote off-grid antennas and satellites).

A robust MRV framework for the energy sector will closely link to and integrate with other key sectors, and therefore lead to a better understanding of the mitigation opportunities in the sector, given its potential to reduce the greenhouse gas emissions and address climate change. With the objective of communicating consistent, transparent, and comprehensive information on GHG emissions, actions, and support, the transparency of climate action and support provides an essential basis for understanding current GHG emissions inventories, the ambition of existing efforts, as well as understanding progress of the NDC implementation at national level.

Current institutional arrangements under the energy sector

According to the IPCC categorization for GHG emissions inventory, the energy sector include:

- Energy industries (mainly electricity generation and transmission): Electricity holding company, Ministry of Energy, etc.
- Manufacturing industries (mainly petroleum products and biomass): Ministry of Energy, Ministry of industry, state ministries, etc.
- Transport: Ministry of transport, urban planning, private sector, etc.
- Commercial/residential and services (mainly petroleum products and biomass: charcoal, firewood): National Forest Corporation, Ministry of Agriculture, States, private sector, etc.
- Fugitives' emissions (from petroleum crude and products): Ministry of Energy and Petroleum.

Therefore, for each subsector there are several institutions that play an important role in GHG

inventory and emissions mitigation and adaptation, such as the forestry sector in Sudan that is the focal point for biomass activity data and emissions estimation.

MRV system is under establishment in the forestry sector which is a requirement for Sudan to achieve REDD+ readiness preparation and implementation of REDD+ activities. The following diagram shows the organizational structure or institutional arrangement for the forestry MRV system.

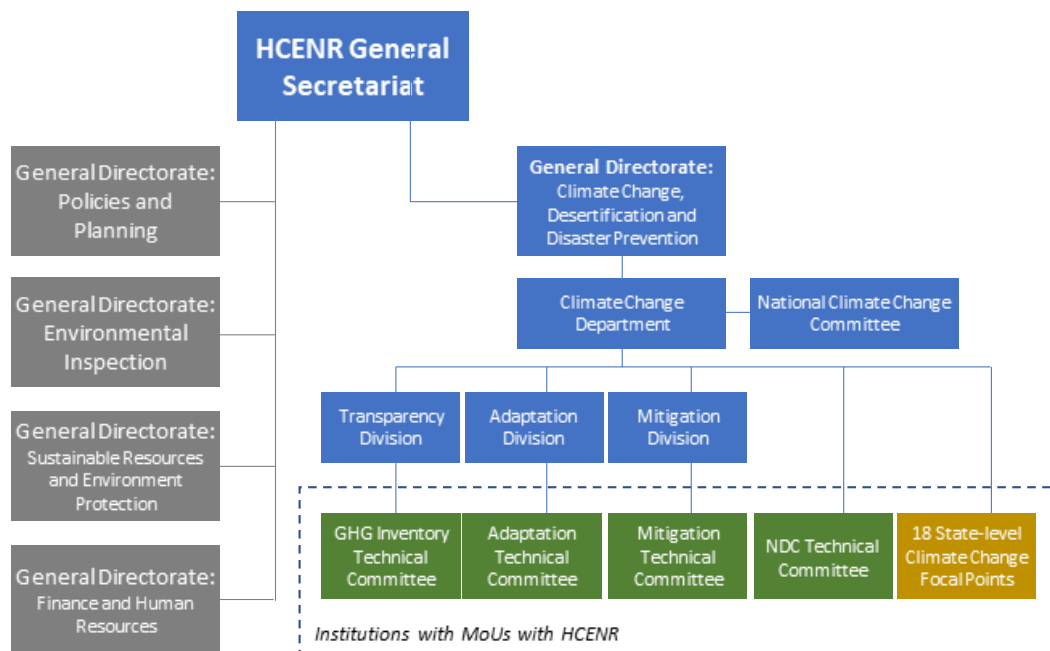


Figure 1 Organizational structure for institutional arrangement in support of MRV activities (Source: FNC)

For the electricity generation and transmission subsector, an initiative to establish an MRV system by the International Renewable Energy Agency (IRENA) was undertaken 2~3 years ago. The initiative proposed an organizational structure for institutional arrangement in support of MRV for the electricity sub sector as shown in the figure below.

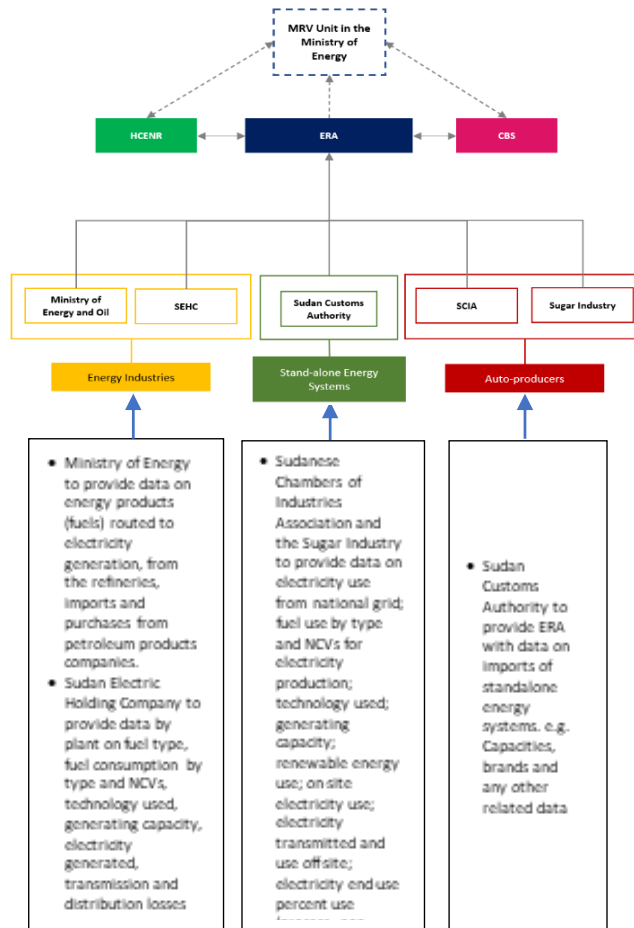


Figure 2 Organizational structure for institutional arrangements in support of MRV in the energy sector (Source: IRENA)

Identified Gaps by Stakeholders

The forms (presented Annex 1) were submitted to the focal points and technical working group within the identified stakeholders. General qualitative information regarding the existing institutional arrangements were received from the consultees. As mentioned earlier, the form cover key components for the well-functioning institutional arrangement (based on Handbook on institutional arrangements to support MRV/transparency of climate action and support and best practices) the overall structure, responsibility and climate change mandate in the consultee institutions, capacity and resource allocated to climate change related activities in terms of both human and financial resource as well as management Structure and processes that enable the stability and adaptability, the ability to affect the decision making and Sectoral Coordination mechanisms.

Ministry of Energy and Petroleum

The results of assessing the existing institutional arrangements for the ministry of energy and petroleum indicate that there is no lead institute to collect energy statistics. In addition, a lack of coordination between entities within the ministry leads to duplicated work and inefficient utilization of funds. In terms of human and financial resources, there are an insufficient number of staff working on energy statistics. It is concluded that there are limited resources and funds for capacity building and the enhancement of effective data collecting, handling, and disseminating systems.

Table 1-Summary of the assessment results for the Ministry of Energy and Petroleum

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure related to CC	Authority	Stability and adaptability	Sectoral Coordination
Ministry of Energy and Petroleum	Not exist	1. Only 10 employees are dedicated for climate change related data 2. There is no allocated financial resources or budget for climate change related data	Although there is a directorate for Health, Safety and Environment (HSE) but there is no designated department or unit for climate change related issues.	Limited	Not exist	A lack of coordination between entities within the ministry leads to duplicated work and inefficient utilization of funds

Forests National Corporation, Ministry of Agriculture

Despite the fact that the Ministry of Agriculture's FNC is considered as an active government institution in term of climate change action, but still the legal framework with respect to the collection of energy statistics and climate change related data is unclear. Different methodologies used in calculations and estimations of energy statistics in term of biomass all through the supply chain. There is an absence of linkages between databases from producers and users. In terms of human and financial resources, the trained staff as well as the financial resources are insufficient.

Table 2- Summary of the assessment results for the Forests National Corporation (FNC)

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure for MRV unit	Authority	Stability and adaptability	Sectoral Coordination
Forests National Corporation (FNC)	- GHG Unit under MRV Unit. (LoA) between FNC and TNC	1. around 10 employees are dedicated to climate change related data 2. there is no allocated financial resources or budget for climate change related data unless through projects with external funds.	Not fully defined	Not fully defined	The flow of climate change related projects in which the FNC is the national implementing agent (for example REDD+), resulting in increasing interest within the corporation to develop and sustain its MRV system	Horizontal coordination with FNCs offices in states and vertical coordination with (1) HECNR and (2) Ministry of Agriculture

Central Bureau of Statistics

According to the meeting² with Central Bureau of Statistics top management, the bureau has personnel experienced with qualitative and quantitative data collection for crosscutting supported with effective legal framework (e.g., The Statistics Act, 2003). The bureau has the potential to develop questionnaires, templates and survey forms for each climate change related sector and governmental entities. Furthermore, the internal system has a robust process for data validation. However, the engagement of the bureau in climate change related data gathering requires both capacity building and financial resources.

Table 3- Summary of the assessment results for the Central Bureau of Statistics (CBS)

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure- climate change unit	Authority	Stability and adaptability	Sectoral Coordination
Central Bureau of Statistics	Directorate for natural resource statistics	For the time being, there are no resources allocated for climate change related statistics	Not exist	In general, CBS has the authority to collect data from all government related bodies and firms. The data collection can be in terms of administrative and technical reports generated by the governmental bodies, or it can be	Since CBS is a governmental arm for statistics, data collection efforts and results are highly dependent on the availability of funds from the government.	Horizontal coordination with all governmental sectors

² The meeting is held jointly with CBIT national consultants (see Annex -4).

				through census and targeted surveys.		
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Ministry of Industry

The ministry of industry has the technical authority to provide the data, however there is an absence of linkages between different stakeholders, clear methodology used for collecting, analyzing and reporting.

Table 4- Summary of the assessment results for the Ministry of Industry

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure	Authority	Stability and adaptability	Sectoral Coordination
Ministry of Industry	Ozone office (Unit) under Montreal Protocol	There are limited number of staff	N/A	Technical Authority and provision of data	Stable in terms of roles and policies	Existing coordination mechanism with (1) Higher Council for Environment & natural Resources (2) General Directorate for Industrial Production Metrological Organization

Electricity Regulatory Authority

The Electricity Regulatory Authority (ERA) is an independent regulatory body in Sudan that oversees the electricity sector in the country. The ERA was established in 2000 under the Electricity Act and operates under the Ministry of Energy and Mining. The main objective of ERA is to ensure the provision of reliable and affordable electricity to consumers in Sudan while promoting competition, transparency, and accountability in the electricity sector. To achieve this objective, the ERA is responsible for the re he Electricity Regulatory Authority (ERA) in Sudan plays a significant role in the collection and dissemination of data related to climate change. The ERA recognizes the importance of reliable data on climate change for evidence-based decision-making and policy formulation in the electricity sector. However, lack of effective coordination between the governmental entities and other key stakeholders may considered as a gap.

Table 5- Summary of the assessment results for Electricity Regulatory Authority

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure for CC unit	Authority	Stability and adaptability	Sectoral Coordination
Electricity Regulatory Authority	Not exist	1. only one employee is dedicated for climate change related data 2. there is no allocated financial resources or budget for climate change related data	Not exist	Provision of performance indicators and energy efficiency to be used by related bodies	N/A	Existing coordination mechanism with (1) Electricity Company

National Energy Research Centre (NERC)

According to the meeting with NERC, there is no legal framework or any institutional arrangements in place for energy statistics. Also, energy statistics are not accounted for separately in the center's annual budget. They are only present within projects. The center's Studies Unit has personnel experienced with qualitative and quantitative data collection for energy statistics, but they are insufficient in terms of number. The center creates questionnaires and survey forms for each project, meaning there are no standardized templates and questionnaires for energy statistics, nor do they follow any available manuals. Also, there are no particular processes followed for data validation or any methodologies documented for estimations. In terms of data dissemination, there are no fixed schedules for publishing energy data and statistics.

Table 6- Summary of the assessment results for the National Energy Research Centre

Institution	Assessment Dimensions					
	Climate Change mandate	Capacity and Resource	Management Structure	Authority	Stability and adaptability	Sectoral Coordination
National Energy Research Institute	CC unit was established	<ul style="list-style-type: none"> 3 employees are dedicated for climate change related data there is no allocated financial resources or budget for climate change related data 	N/A	limited	Project based activities.	N/A

The Proposed Institutional Arrangements

The transition from the existing arrangements to the MRV aligned with the enhanced transparency framework (ETF) will introduce enhanced scope and depth of reporting for developing countries, which underscores the importance of having strong sustainable institutional arrangements in place (UNFCCC, 2020). effective institutional arrangements enhance and facilitate information exchange and reporting across the implementing entities (the energy and transport in case of the current project). According to UNFCCC (2020), institutional arrangements can be organized around five separate components: Organizational mandates; Expertise; Data flows; Systems and tools; Stakeholder engagement. The below figure adopted from UNFCCC, 2020 explains these components and the silent feature of a well-functioning institutional arrangement. The next subsections illustrate the proposed institutional arrangement for the energy sector.

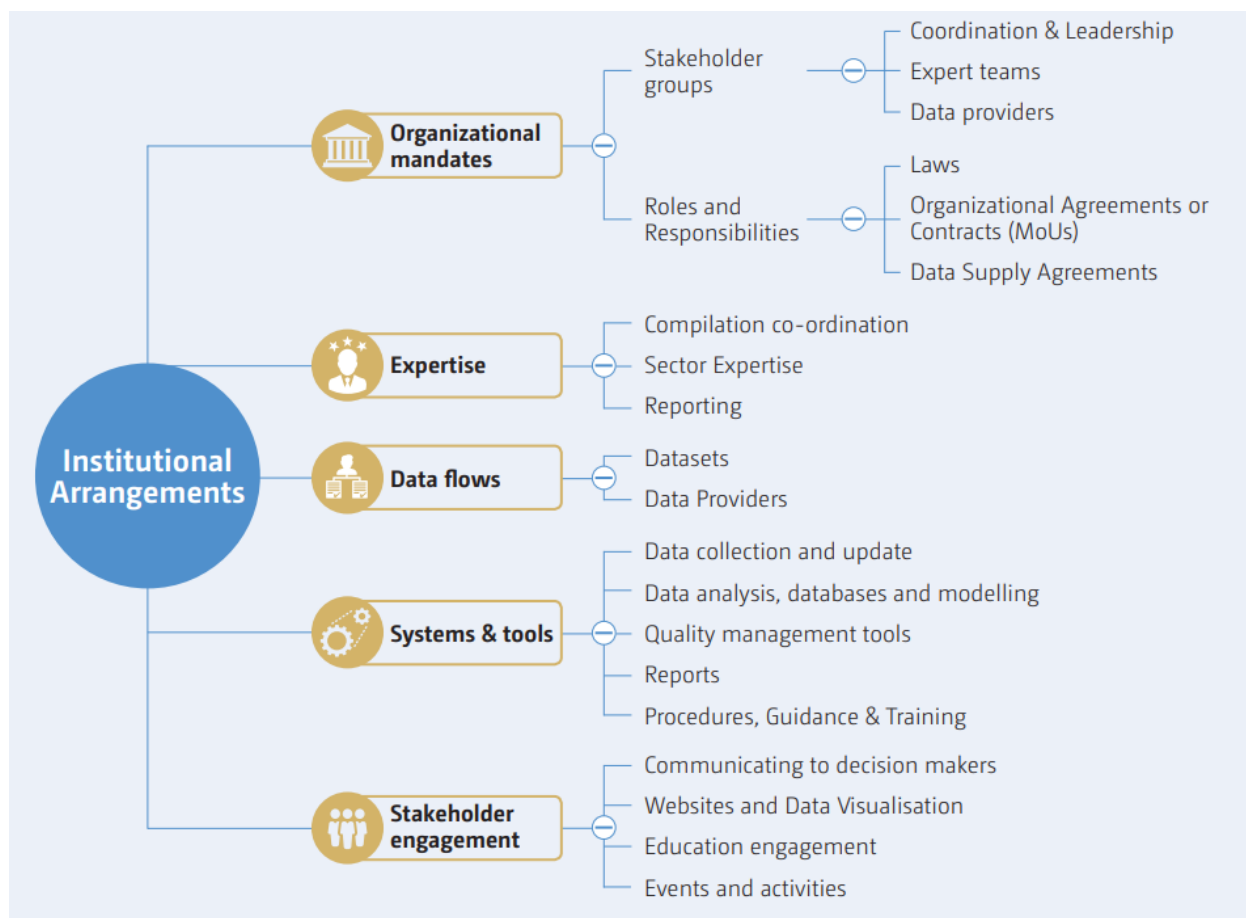


Figure 3- Key components of the institutional arrangement. Source: UNFCCC (2020)

The key stakeholders

Ministry of Energy and Petroleum includes the Electricity sector, and Oil sector, in which the electricity sector is represented by the Sudanese Electricity Holding Company (SEHC) and the oil and gas sector is represented by the Sudanese Petroleum Corporation (SPC).

Fuel consumption and electricity generation reports for both grid-connected and off-grid thermal



Figure 4- Organizational structure of the ministry of energy and oil

power plants are produced monthly by the Information Unit in the Sudanese Thermal Power Generating Company (STPG). The Health and Safety Division produces monthly reports on emissions generated from power plants. The Sudanese Electricity Transmission Company (SETC) collects real-time data on electricity generation, imported electricity and fuel consumption through a Supervisory Control and Data Acquisition (SCADA) system. Daily reports are produced in spreadsheets (Excel) and archived in the National Load Dispatch Centre (NLDC) of SETC. The Sudanese Electricity Distribution Company (SEDC) produces monthly reports on electricity distribution, which are archived along with the data in the company's data center. Hydropower dams are operated by the Sudanese Hydropower Generation Company (SHGC). Data for hydro power exist in both the SHGC and the Load Dispatch Centre in SETC. The Sudanese Electricity Holding Company (SEHC) data and reports are treated as confidential, and permits are required to obtain them.

On the other hand, The Renewable Energy Directorate and the National Energy Research Centre are the main entities responsible for conducting renewable energy studies, resource assessment, producing manuals, plans and conducting research in for solar, wind and hydropower. The Ministry of Mining's Geological Directorate is responsible for research related to geothermal energy.

The Sudanese Petroleum Corporation (SPC) collects data on oil production, imports, exports, consumption, international marine bunkers, international aviation bunkers and stock changes as estimation reports monthly. Data focus on energy use. This is done through its various directorates, especially downstream entities:

- General Directorate of Supplies and Marketing of Petroleum
- Bashair Pipeline Company (BAPCO) and Petrolines Company (PETCO) crude transportation companies.
- Refineries and distribution companies for petroleum products

Data is provided and managed in files and papers. Oil data is considered confidential and official permission is required to obtain the data.

The Ministry of Agriculture, led by its entity Forests National Corporation (FNC), plays a significant role in integrated land use systems in Sudan with regard to socio-economic development and environmental protection functions. Also, it is responsible for tracking bioenergy fuel resource (wood fuel, charcoal and agriculture) residues in Sudan. The FNC has conducted several studies since the 1980s that could be used as a baseline for policy making and planning for bioenergy fuel resources.

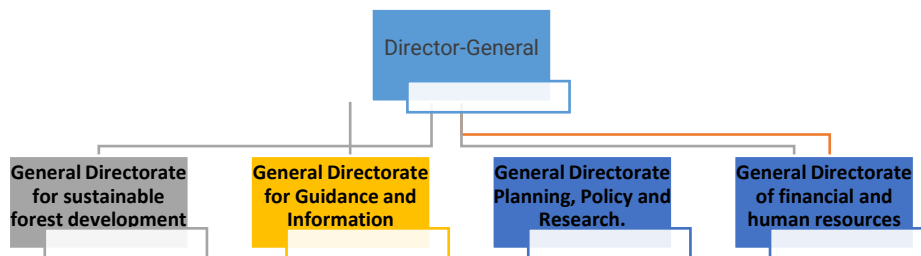


Figure 5- Organizational Structure of the FNC

National Energy Research Centre (NERC) is a government institution in Sudan that is responsible for conducting research and development activities in the field of energy. NERC was established in 1982 and is affiliated with the Ministry of Energy at that time. The main objective of NERC is to promote sustainable development and the efficient use of energy resources in Sudan. To achieve this objective, NERC conducts research, provides technical assistance, and offers training and education in various areas of energy, such as renewable energy, energy conservation, and energy efficiency. NERC also collaborates with national and international organizations to implement energy projects and programs. For example, NERC has partnered with the United Nations Development Programme (UNDP) to implement the Sudanese Solar Energy Development Project, which aims to promote the use of solar energy in rural areas of Sudan. In addition, NERC serves as a national energy information centre that collects, analyses, and disseminates data and information on energy resources, consumption, and production in Sudan.

Suggested Institutional Arrangement for Energy Sector

For effective implementation of a robust MRV system³ for the in Sudan, the following schematic represents the proposed institutional framework. the framework has been developed based on the analysis of the existing situation, stakeholders’ consultation relevant to addressing the issues, and the transparency objectives. All of these pointed to the need for a simple and autonomous design. The arrangement emphasizes all the sector Stakeholders include institutions and individuals that have financial, coordination, regulatory, operating, and/or reporting responsibilities regarding the activity data.

In addition, the arrangement considers the need for Co-ordination, in a multiple setting of different interests, motives, visions, missions; organizational mandates, is essential for climate MRV. Co-ordination is required to facilitate a seamless flow of data and information, cohesion, and integration in each sector.

Strong stakeholder engagement ensures that the transparency system reaches a broad range of

³ The proposed institutional arrangement has been developed based on consultation with the CBIT national consultants.

stakeholders, including those from national government, local government, the private sector, academia, NGOs, the media, and the public, so that data can be gathered from the most reliable and relevant sources and the outputs can inform their decision-making processes.

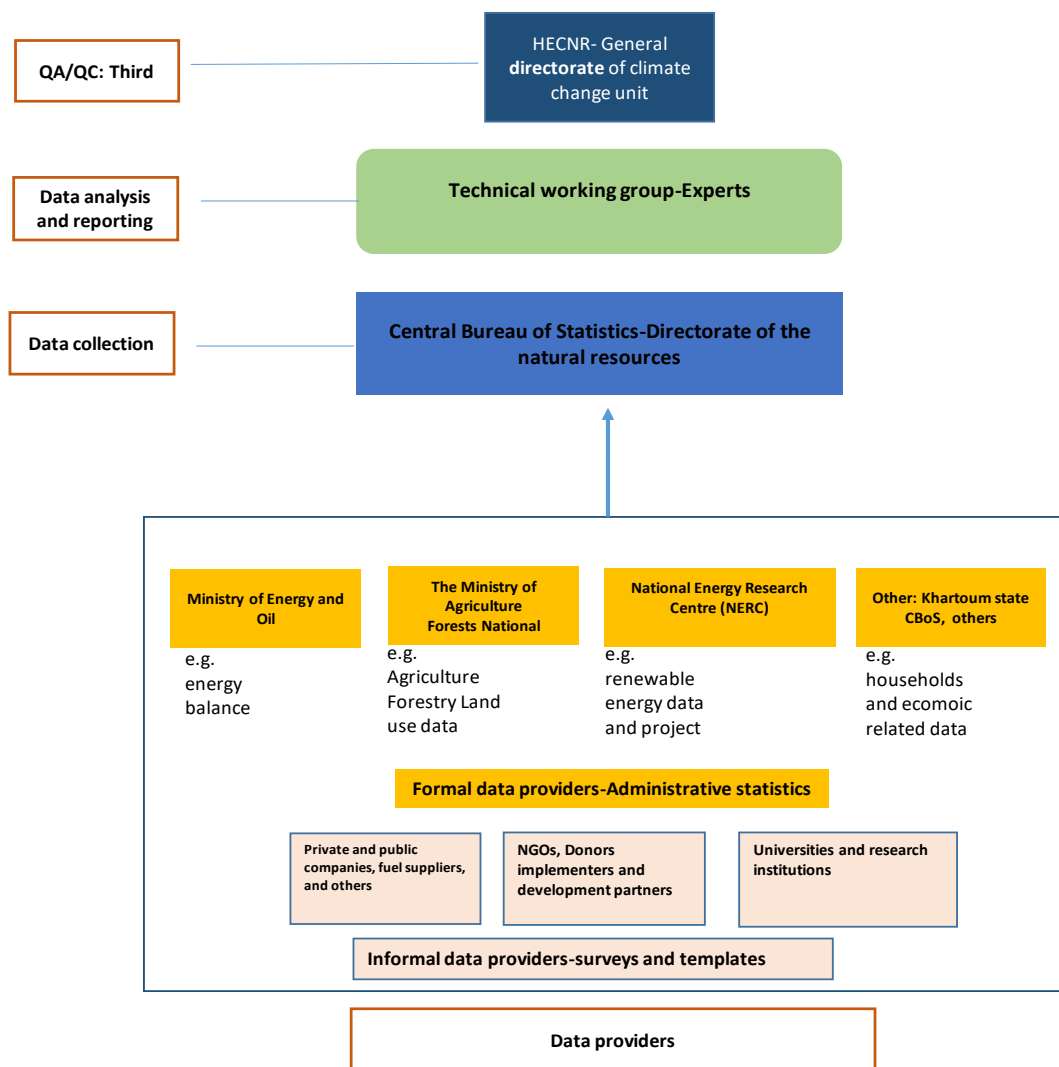


Figure 6- Proposed Institutional Arrangement for the energy sector

Roles and Responsibilities

HECNR-CCU is key link to the intergovernmental process and the international community responsible for the following:

- Setting the overall frameworks for national and international climate change related reporting. All information on climate impacts and action and will bring together information from a range of ministries and agencies, the private sector, academia and subnational governments.

- Identifying the methods, procedures and guidelines including the templates, format and quality assurance.
- Coordinates the activities needed to ensure that outputs are prepared and are of sufficient quality to meet the country's commitments.

Technical Working Group/expert, as HECNR operates in an administrative manner, technical functions are suggested to be delegated via clear mandates and terms of reference, to a specialized climate change, environmental or statistical experts/agency with the relevant technical expertise.

Central Bureau of Statistics CBS currently operates under the 2003 Statistics Act which empowers the Director General to collect, analyse and disseminate statistical information and provide technical advice to the government departments on statistical matters. The Central Bureau of Statistics is responsible for coordinating statistical activities throughout Sudan and for producing and disseminating official statistics on the country's population, economy, society, and environment. The 2003 Act contains some important new features, including the setting up of National Statistical Council, and makes the CBS responsible for the overall coordination and supervision of the production of statistics in the country.

The proposed institutional arrangement assumes a critical role for the CBS based on the 2003 Statistics Act as major data-generating agency in the country and, according to the Statistics Act, mandated to provide statistical advice to government departments. CBS is supposed to be the leader in terms of coordinating, collecting and gathering the climate related data from the relevant ministries and entities.

The Sudanese Statistical Law provides a legal framework for the collection, compilation, analysis, and dissemination of climate related data in a coordinated and integrated manner. The law aims to ensure that statistical data is of high quality and meets international standards.

Data providers can be divided into formal and informal. The formal data providers are the key ministries and governmental agencies e.g., ministry of transport, ministry of energy and oil and other relevant institutions including ministry of finance and economic planning and Central bank of Sudan. The other data providers include the private and public operator companies, universities and research institutes.

Recommendations

Based on the situational analysis of key institutions in the Sudanese Energy sector and the current institutional arrangement, the following recommendations are drafted for meeting the transparency requirements of the Paris agreement through efficient institutional arrangements:

1. Appointing a regulatory body: Although “Energy” is becoming a title of a federal ministry after 2019, however the ministry has no directorate or subsidiary responsible for energy policies and statistics. It is important to appoint one regulatory body to oversee the energy sector (from fossil fuel, biomass, and electricity) and ensure compliance with transparency requirements. The regulatory body should have the power to enforce regulations and impose penalties for non-compliance.
2. Develop a comprehensive energy policy: Sudan should develop a comprehensive energy policy that outlines its goals, targets, and strategies for reducing GHG emissions. The policy should also include measures to promote renewable energy sources and energy efficiency.
3. Increase transparency in reporting and decision-making: The Ministry of Energy and Petroleum should increase transparency in data provision and decision-making processes related to the energy sector. This includes publishing information on contracts, licenses, and permits related to energy projects and actual fuel consumption by different sectors, firms, and institutions.
4. Strengthen monitoring and reporting systems within the Ministry of Energy and Petroleum and affiliated bodies to include GHG emissions from the different energy uses. This includes developing a robust data collection system and regularly reporting of activity data and emissions to CBS and consequently to HCENR.
5. Engage stakeholders: including civil society organizations, local communities, and private sector actors in the development of its energy policies and decision-making processes. This will help ensure that all perspectives are taken into account and increase buy-in for sustainable energy solutions.
6. Build capacity: Sudan should build capacity within government agencies responsible for implementing climate policies related to the energy sector. This includes providing training on climate change mitigation strategies, renewable energy technologies, and monitoring and reporting systems.
7. Foster international cooperation: Ministry of Energy and Petroleum, FNC and NERC are recommended to foster international cooperation with other countries on climate change mitigation efforts related to the energy sector. This includes sharing best practices, technology transfer, and financial support for sustainable energy projects.

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Annexes

Annex 1: Form/ Questionnaire

Inputs provided by: (please provide the Official name of your organization)
1. Structure of the institution and institutional mandate
(Please elaborate and provide information on the overall structure of your Institution, mandate, functions and objectives including the relationship with other governmental institutions/organizations and the cabinet. Please feel free to expand the boxes as needed throughout the form)
2. Affiliated bodies
3. Mandate of the institution: clear mandate on climate change
(Is there any clear mandate, legal or institutional framework/policies on climate change, If yes elaborate in the mandate, roles and responsibilities and attach the relevant/support documents.)
4. Capacity and resource constraints
4.1 Availability of human resources: The ability of an institution to allocate sufficient human resources
(Are there any dedicated employees for climate change data, statistics, issues. If yes, elaborate on the following: Number, skills, training, and responsibilities and attach the relevant/support documents.)

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4.2 Availability of financial resources: The ability of an institution to allocate sufficient financial resources

(Is there any allocated funding, budget for climate change data, statistics or issues, specify the source of fund, organizational own fund, special fund, international funds. Please elaborate in the sustainability of the fund and attach the relevant/support documents.)

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5. Management practices and processes

5.1 Management Structure

is there any sustainable management structure for addressing the climate change. If yes, kindly indicate the structure/component of the existing unit/position/committee, Does the key unit/body responsible have a sustainable development roadmap or strategy in place with clearly defined roles and targets?

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5.2 Authority (the ability to influence key governmental decisions/to allocate resources)

is the defined unit, position, or committee having the authority or the legal framework to influence the decision, Is the unit/body strongly supported by the highest levels of institution.)

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5.3 Stability/adaptability of the institutional framework

is the defined unit, position, or committee adaptable in terms of new roles, approaches or policies

6. Sectoral coordination: Coordination mechanisms

(Does your institution/ organization have a coordination mechanism in place to foster horizontal coordination across sectors, and vertical coordination across government levels in issues **other than** climate change. If yes please elaborate in the mandate, objectives and institutional network)

(Does your institution/ organization have a coordination mechanism in place to foster horizontal coordination across sectors, and vertical coordination across government levels in issues **related** to climate change. If yes please elaborate in the mandate, objectives and institutional network.)

Annex 2: Identified stakeholders

#	Stakeholders Entities
1	Ministry of Interior (Sudan Customs Authority)
2	Ministry of industry
3	Ministry of Finance and National Economy
4	Ministry of Energy and Petroleum
5	Ministry of Agriculture and Forestry (Forests National Corporation (FNC))
6	Ministry of Transport
7	Ministry of Urban Development, Roads and Bridges
8	Central Bureau of Statistics
9	National Research Centre
10	Energy Research Centre
11	Electricity Regulatory Authority

Annex 3: Summary of the results

#	Institution	Assessment dimensions					
		CC mandate	capacity and resource	Management Structure	Authority	Stability and adaptability	Sectoral Coordination
1	Ministry of Energy and Oil	Not exist	1. only 10 employees are dedicated for climate change related data 2. there is no allocated financial resources or budget for climate change related data	Not exist	Limited	N/A	A lack of coordination between entities within the ministry leads to duplicated work and inefficient utilisation of funds /A
2	Ministry of Urban Development, Roads and bridges	Not exist	1. only one employee is dedicated for climate change related data 2. there is no allocated financial resources or budget for climate change related data	Not exist	Not exist	Not exist	N/A
3	Ministry of Industry	Ozone office (Unit) under Montreal Protocol	There are limited number of staff	Not exist	Technical Authority and provision of data	Stable in terms of roles and policies	Existing coordination mechanism with (1) Higher Council for Environment & natural Resources (2) General Directorate for Industrial Production Metrological Organization
4	Ministry of Transport*	Not exist	Not exist	Not exist	Technical Authority and provision of data	Not exist	Existing coordination mechanism with Higher Council for Environment & natural Resources
5	National Energy Research Institute	CC unit was established	1. 3 employees are dedicated for climate change related data 2. there is no allocated financial resources or budget for climate change related data	Not exist	limited	Not exist	Not exist
6	Central Bureau of Statistics	Directorate for natural resources	Not exist	Not exist	Technical authority	Not exist	Horizontal coordination with

		statistics			and provision of data		many government sectors
7	Forests National Corporation (FNC)	<ul style="list-style-type: none"> GHG Unit under MRV Unit (LoA) between FNC and TNC 	<ol style="list-style-type: none"> 10 employees are dedicated for climate change related data there is no allocated financial resources or budget for climate change related data 	N/A	N/A	N/A	Horizontal coordination with FNC's offices in states and vertical coordination with (1) HECNR and (2) Ministry of Agriculture
8	Sudan Customs Authority**	(SCA) Monitors the application of the provisions of the relevant international conventions The role of customs in protecting the environment could expand considerably with the implementation of climate change related initiatives.	<ol style="list-style-type: none"> 6 employees are dedicated for climate change related data The organizational own fund 	Yes	Technical authority and provision of data	Stable in terms of roles and policies	Horizontal coordination with many governmental sectors and HECNR
10	Electricity Regulatory Authority	N/A	<ol style="list-style-type: none"> only one employee is dedicated for climate change related data there is no allocated financial resources or budget for climate change related data 	N/A	Provision of performance indicators and energy efficiency to be used by related bodies	N/A	Existing coordination mechanism with (1) Electricity Company (2) Sudanese Chambers of Industries Association (3) Sudanese standard Metrological Organization

*Based on submitted forms of CBIT project.

**Based on submitted forms of CBIT project.

Annex 4: Meeting with the Central Bureau of Statistics, March, 2023



Annex 5: consultative workshop on institutional arrangement for Energy and Transport Sectors

INITIATIVE CLIMATE ACTION TRANSPARENCY

Energy and Transport Sectors TWGs Workshop-Khartoum Sudan

Report

Dr Abdelrahman Eltahir Ahmed and Dr. Qousay Awad Ahmed
2/20/2023

ICAT Project – Sudan TWGs Workshop

**Initiative Climate Action Transparency
TWGs Meeting/Workshop Report
Faisal Bank Cultural Center- Khartoum- Sudan
20 February 2023**

1. The Workshop

This TWGs Meeting/Workshop was an intended meeting for the Initiative Climate Action Transparency project undertaken under the ICAT Secretariat and the UNEP-CCC partnership. The overall objectives of the workshop were to give an overview on the project first deliverable (**Gap Analysis and Needs Assessment on MRV System in the Energy and Transport Sectors, Sudan**) as well as to highlight the requirements from all participants for the project's second deliverable (**Institutional Arrangement in the Energy and Transport Sectors, Sudan**). Two PPTs are attached.

2. Participants

The Workshop was attended by 19 participants, five apologies and five absent (attendance sheet attached). The consultants will make sure to have face to face meeting with those who didn't attend to ensure the dissemination of information and quality of the second deliverables.

Faisal Bank Cultural Center- Khartoum- Sudan

ICAT Project – Sudan TWGs Workshop

Table 1: Stakeholders Targeted by ICAT Project

SN	Stakeholders Entities
1	Ministry of Interior
2	Ministry of Communications and Digital Transformation
3	Ministry of Finance and National Economy
4	Ministry of Energy and Petroleum
5	Ministry of Agriculture and Forestry
6	Ministry of Transport
7	Ministry of Urban Development, Roads and Bridges
8	Central Bureau of Statistics
9	National Research Centre
10	Energy Research Centre
11	Private sector and industrial facilities (Food Industry, Cement factories, Sugar companies, Energy, MOil & Gas industry)
12	Unions, chambers of commerce and other associations
13	The Higher Council of Environment and Natural Resources (HCENR)

ICAT Project – Sudan TWGs Workshop

3. Workshop approach and methodology

The workshop was based on provision of presentations and the effective participation of the participants through open discussion. To that end two Power Point Presentations were prepared (in English), and the discussion carried in Arabic to assure the participants' understanding of the objectives and outcomes of the project as well as to agree on the roles and responsibilities of all participants in the coming deliverables.



<p>The Second Presentation (Attached)</p> <p>Initiative Climate Action Transparency (ICAT) Project – Sudan</p> <p>MRV SYSTEM FOR ENERGY SECTOR IN SUDAN</p> <p>By Dr. Abdelrahman Eltahir</p>	
<p>Content:</p> <ul style="list-style-type: none"> ✓ ICAT General Objectives ✓ ICAT Specific Objectives (Sudan Project) ✓ Gap Analysis and Needs Assessment on MRV System- Energy and Transport sectors ✓ Areas of MRV Improvements 	
<p>The First Presentation (Attached)</p> <p>Initiative Climate Action Transparency (ICAT) Project – Sudan</p> <p>MRV SYSTEM FOR TRANSPORT SECTOR IN SUDAN</p> <p>By Dr. Qousay Awad Ahmed</p>	
<p>Consent:</p> <ul style="list-style-type: none"> ✓ General Background ✓ Potential of Transparency ✓ Institutional Arrangement ✓ Energy Sector – Transport Sector ✓ Questionnaire 	

Table 2: Selection of the technical working groups Energy & Transport

Faisal Bank Cultural Center- Khartoum- Sudan