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## Mid-Term Review (MTR) for Evaluation Report

of the UNDP/GEF project

### "Promoting Utility Scale Power Generation from Wind Energy - in Sudan Project (PUSPG-WE)"

Project ID:00090222

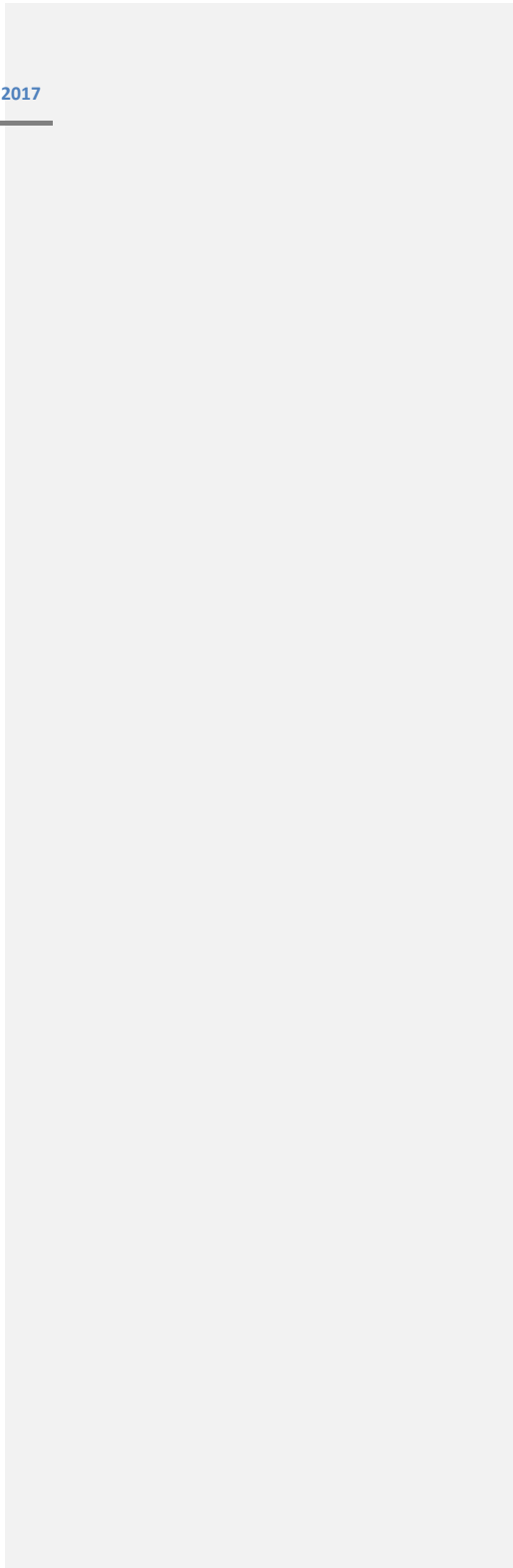
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**List of Acronyms**

<b>UNDP CO</b>	UNDP Country Office
<b>CO<sub>2</sub></b>	Carbon dioxide
<b>CSP</b>	Concentrating Solar Power
<b>EE</b>	Energy Efficiency
<b>EENS</b>	Expected Energy Not Supplied
<b>EIA</b>	Environmental Impact Assessment
<b>ERA</b>	Electricity Regulatory Authority
<b>GDP</b>	Gross Domestic Product
<b>GEF</b>	Global Environment Facility
<b>GHG</b>	Greenhouse Gas
<b>GT</b>	Gas Turbine
<b>HCENR</b>	Higher Council for Environment and Natural Resources
<b>IEA</b>	International Energy Agency
<b>IPP</b>	Independent Power Producer
<b>MIC</b>	Ministry of International Cooperation
<b>M&amp;E</b>	Monitoring and Evaluation
<b>MEM</b>	Ministry of Energy and Mining
<b>MoNRPD</b>	Ministry of Environment, Natural Resources and Physical Development
<b>MoF</b>	Ministry of Finance
<b>MoM</b>	Ministry of Mining
<b>MoP</b>	Ministry of Petroleum
<b>MoSC</b>	Ministry of Science and Communications
<b>MWRE</b>	Ministry of Water Resources and Electricity
<b>MRV</b>	Monitoring, Reporting and Verification
<b>MW</b>	Megawatt
<b>NAMA</b>	Nationally Appropriate Mitigation Action
<b>NEC</b>	National Electricity Corporation
<b>NERC</b>	National Energy Research Centre
<b>NGO</b>	Non-Governmental Organisation
<b>O&amp;M</b>	Operations & Maintenance
<b>PIR</b>	Project Implementation Review
<b>PMU</b>	Project Management Unit
<b>PPG</b>	Project Preparation Grant
<b>PPP</b>	Public Private Partnership
<b>PB</b>	Project Board
<b>PUSPG-WEP</b>	Promoting Utility Scale Power Generation from Wind Energy Project
<b>PV</b>	Photovoltaic
<b>QPR</b>	Quarterly Progress Report
<b>RCU</b>	UNDP Regional Coordination Unit
<b>RE</b>	Renewable Energy
<b>RTA</b>	UNDP Region-Based Technical Advisor
<b>SETCO</b>	Sudanese Electricity Transmission Co.
<b>SWH</b>	Solar water heater
<b>SSMO</b>	Sudanese Standards and Metrology Organization
<b>STPG</b>	Sudanese Thermal Power Generating Co.
<b>TPR</b>	Tripartite Review
<b>TTR</b>	Terminal Tripartite Review
<b>TWh</b>	Terawatt-hour
<b>WB</b>	World Bank
<b>UNDAF</b>	United Nations Development Assistance Framework
<b>UNDP</b>	United Nations Development Programme
<b>UNEP</b>	United Nations Environment Programme
<b>UNFCCC</b>	United Nations Framework Convention on Climate Change

## 1.0 Executive Summary

Like many developing countries, Sudan has a shortage of electricity. Approximately 35% of the population has access to electricity (MWRE-Renewable Energy Master Plan 2013). Even then, it is not reliable and experiences regular power outages. Hydro-power has the largest share of energy generation. The potential to expand hydro-power to meet future needs is limited. Sudan does not have significant oil or gas production and as a result will have to turn to importation of fossil fuels to meet future energy needs. Climate change threatens to affect rainfall patterns on which Sudan relies for the water that generates its hydro-power. This further emphasises the need for Sudan to diversify its energy sources. As part of this effort, the Promoting Utility Scale Power Generation from Wind Energy (PUSPG-WE) project seeks to address these problems by promoting the use of wind energy in Sudan. The project supports the removal of barriers to the adoption of utility-scale wind energy tied to the national grid in Sudan. Wind energy has been identified as a priority mitigation technology by the Government of Sudan, and, although it is a mature technology globally, it has not yet been adopted in Sudan. A systems approach is proposed to integrate energy policy analysis within the broader developmental objectives of Sudan. The project also establishes regulatory frameworks for encouraging private investments in grid-connected wind energy. Sudan currently has plans to develop utility-scale wind farms in four regions: Dongola in the North, Nyala in the West, the Red Sea coastal region and Khartoum.

The development objective of the project is to help diversify Sudan's power sources and reduce its reliance on fossil fuels, particularly for future expansion and to reduce greenhouse gas (GHG) emissions by promoting the use of wind energy. The project will therefore help increase Sudan's energy security and support its development. The project has been designed to play a catalytic role in this transformational scaling-up of wind energy, and renewable energies more broadly. The project has a total budget of US\$ 217,486,364 from which US\$ 250,000 is from UNDP, US\$3,536,364 from the GEF and the remaining from the Government, which will be utilised over a period of five years since January 2015. In addition to this, the project has planned to provide direct technical assistance to the Dongola wind farm and will aid in the replication of experiences from the Dongola wind farm to be applied to the Red Sea wind farms and subsequent wind farms. It also aims to put in place legislation and a framework to promote private sector involvement in renewable energy in Sudan. It aims to do so through four (4) interconnected outcome components, which are also expected to work collaboratively with other development projects in the areas.

The project has the following four (4) integrated outcomes;

1. **Outcome 1:** Grid-connected power generation from wind farm introduced.
2. **Outcome 2:** Policy and institutional regulatory framework adopted.
3. **Outcome 3:** The wind technology support and delivery system Strengthened.
4. **Outcome 4:** Adaptive learning and replication plan supported

The purpose of this Mid-Term Review (MTR) is to provide an overall assessment of the project and an opportunity to critically assess administrative and technical strategies and issues. More specifically, the MTR is implemented to meet the following objectives: i) to assess progress being made towards the attainment of project results and impacts; ii) to provide a basis for decision making on necessary amendments to project design and improvements to project implementation; iii) to assess the effectiveness of and promote accountability for resource use; and iv) to document and disseminate lessons learned.

The evaluation gives recommendations to improve the potential of the project to achieve expected outcomes and objectives within the project timeframe. The MTR of PUSPG-WEP has identified a number of issues that are presented in the following section as recommendations for use in the way forward and implementation of similar projects in future.

**Commented [NH1]:** Executive summary is too long. Please it will be good to make it concise and results focused, reflects at a strategic level. Ideally 2 to 3 pages "synthesis". Please see attached guidelines on the UNDP final evaluation report template.

## Project performance and progress

### Project performance

The mid-term performance of the project against the targets measured through the indicators is evaluated based on its feasibility, effectiveness, efficiency, relevance and sustainability. Most of the direct technical assistance activities to the Dongola wind farm performed so far are satisfactory and their integration to support in promoting the use of wind energy in Sudan is high. The overall performance of the project is highlighted in ~~Table 1~~ ~~Table 4~~ below.

**Table 1: Overall Project Performance**

Intervention	Feasibility	Effectiveness	Efficiency	Relevance	Sustainability
Project Design	5	n/a	n/a	4	n/a
Implementation Approach	5	4	4	4	3
Stakeholder Involvement <sup>1</sup>	6	5	4	R	5
Technical Reporting	5	4	4	R	n/a
Financial Reporting	6	4	n/a	R	n/a
Integrated Nature	5	3	4	R	4
Office facilities and staffing	6	6	5	R	4
Capacity building support	6	5	5	R	4
Awareness Raising	6	5	4	R	4
Providing direct technical assistance to the Dongola wind farm	6	3	3	R	3
Aid in the replication of experiences from the Dongola wind farm to be applied to subsequent wind farms	5	3	3	R	3
Putting in place legislation and a framework to promote private sector involvement in renewable energy in Sudan	5	5	n.a	R	5
Enabling the Government of Sudan to tender future wind farms as IPP projects	4	3	n.a	R	3
Supporting existing initiatives, such as the draft Electricity Law, the Investment Law	6	n/a	n/a	R	5
Access to wind technologies and practices	6	5	5	R	4
Experiences gained in Dongola serve to reduce the risk of investing in wind farms in Sudan	6	5	5	R	4
Promoting the use of wind energy in Sudan	6	5	6	R	5
Replication plan to promote the replication of wind farms and support replication throughout Sudan	5	4	4	R	4
Stakeholder engagement <sup>2</sup>	6	5	4	R	n/a
Documentation and communication	5	4	4	R	4
Professional Trainings	6	6	6	R	4
Task teams	6	6	6	R	4
Regular M&E	5	5	4	R	4

Score: Feasibility, Effectiveness, Efficiency, Coherence: 6 = highest, 0 = lowest  
n/a = not assessed or non-assessable.

<sup>1</sup> Defined as the ability stakeholders to interact with one another in order to facilitate the implementation of the projects intervention (WHO, 2007:18). Available online at <http://www.who.int/dietphysicalactivity/griffiths-stakeholder-involvement.pdf>

<sup>2</sup> Defined as the process by which the project involves people who may be affected by the decisions it makes or can influence the implementation of its decisions (International Finance Corporation, 2007). Available online [http://www.ifc.org/wps/wcm/connect/938f1a0048855805beacfe6a6515bb18/IFC\\_StakeholderEngagement.pdf?MOD=AJPERES](http://www.ifc.org/wps/wcm/connect/938f1a0048855805beacfe6a6515bb18/IFC_StakeholderEngagement.pdf?MOD=AJPERES)

Sustainability (4 = negligible risks, 1 = severe risks)	Relevance 2. Relevant (R) 1. Not relevant (NR)	Impacts 3. Significant (S) 2. Minimal (M) 1. Negligible (N)
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The project has identified numerous best practices to overcome barriers to the market development of utility-scale wind farms in Sudan to be up-scaled, upgraded or replicated as standard interventions. While the feasibility of most interventions is good, some budget line item weighting/allocation and baseline project financing challenges appear in documentation even though significant effort and time has been put into trying to resolve the challenges. The progress towards the achievement of the Project Development Objective PDO which is “to overcome barriers to the market development of utility-scale wind farms in Sudan” so far is as highlighted in the sections below.

## Project Progress

### Outcome 1: Grid-connected power generation from wind farm introduced

i. The project is positively progressing towards achieving its development objectives. Under this component, the project site isn't preserved, protected or safe guarded from any encroachment threats from urban development and agricultural activities as it currently isn't enclosed. The installation of 100 MW capacity in Dongola was not achieved due to many reasons which were a big risk yet out of the control of the project team i.e. beyond the scope of this project's control due to the recently lifted embargo<sup>3</sup> that was imposed on Sudan and the snowball effects from the cessation of South Sudan from Sudan which impacted on Sudan national budget revenue from the formerly oil-rich regions lost when the South gained independence from Sudan. The biggest risk that has affected the project is how these get financed due to a +19-year embargo (*which has recently been lifted*) at scale due to high financing risks that made capital premiums too costly in relation to development priorities becoming a barrier to the necessary mainstreaming of wind energy in practice. For instance, the project activities were and are still viewed as a top priority that's imbedded as part of the day to day electricity diversification and development priority issues going forward by Sudan's central government. As such the installing of four (4) wind farms by the Ministry of Water Resources and Electricity (MWRE) was also not realised due to the fact the base line project was not implemented because there have been no budget available for it at present. Central government has shown a lot of commitment and desire to try and fund the baseline as evidenced by the attempts and options tried which are well documented in this report. However, large financing capacity from central government has been severely limited and significantly constrained at present.

At an institutional level, there appears to be very high levels of awareness among policy-makers and their staff about the benefits of renewable energy. The acceptance of new technologies takes time as people get acquainted and appreciate the performance of new technologies overtime. The review team notes that as a result of the embargo, ongoing focus has to ensure that the demonstration of grid-connected power generation from wind farm must be introduced even if it's at a much smaller scale than originally planned as the context in which this project was planned and the current context after close to three full years of implementation are vastly different.

<sup>3</sup> Defined by as <https://www.merriam-webster.com/dictionary/embargo> 1 : an order of a government prohibiting the departure of commercial ships from its ports. 2: a legal prohibition on commerce. a trade embargo.

Grid-connected power generation from wind energy is also key to raise awareness, especially of communities, leaders, policy-makers and local community development practitioners. Focus can also be put on other small-scale wind energy easier to finance options which can feed the grid (*centralised or decentralised*) with potential to upscale in phases as and when more funds become available. This is important since grid connection is being used as a catalyst to demonstrate Sudan's commitment in renewable energy and instilling wind energy confidence in the private sector of what new government policy is whilst demonstrating how these relate to Sudan's development priorities to achieve effective mainstreaming of mitigation efforts through the implementation of new technologies being introduced through the project. Although the levels of awareness have significantly improved amongst stakeholder involved with this project since its implementation began, the review team is of the opinion that PUSPG-WEP should still provide opportunities for continued awareness raising in relation to grid-connected power generation from renewables to keep mainstreaming the overall renewable energy development agenda of local communities and the country.

**Recommendation:** The project site needs to be preserved, protected or safe guarded from any encroachment from urban development and agricultural activities as it currently isn't enclosed. Development doesn't need to first encroach into the buffer zone/region of the site before a decision to protect it is made. Once people or activities start to happen within the sites boundaries, it'll be difficult if not near impossible to move people off and efforts between all the relevant stakeholders to avoid this from happening is of paramount importance.

The failure to install a 100 MW grid-connected power generation capacity in Dongola can't be blamed on the project but the changing country context which transitioned and affected central government's financial ability. All things being equal it would have been achieved in full or partially at this stage, yet it remains a long-term possibility. However, to avoid the risk of weaning demand for wind energy (and renewables in general) after so much capacity, awareness raising had been successfully done: short to medium term risk aversion considerations must be done and a decision on which scope option to follow/take be done by December 2017 as the project will only be left with about 24 months (Jan 2018 – Dec 2019) before it ends. As a form of an urgent risk aversion mechanism whilst awaiting medium to long term positive market behaviours from the embargo upliftment, the review team suggests four (4) short to medium term time bound interventions for GEF and UNDP in principle consideration (*listed below*) that will play an important role which demonstrate grid-connected power generation from wind. This must be done with the intention to put in place a wind energy NAMA that can sought funding at a much bigger scale through the NAMA funding windows as a spin off from this project as Sudan's Internal Nationally Determined Contributions INDC have mitigation as one of the aspects with wind energy forming part of that. Equally so the Green Climate Fund (GCF) can also be approached to fund a scaling up project of the proof of concept from this GEF supported project to make the most out of the current gains made through the GEF support in order to pave the way for further market development and scaled wind energy uptake in the potential areas.

The suggested four (4) short to medium term time bound interventions suggested below stem from page 13 of the ProDoc motivation which states that *"the baseline project provides a unique opportunity to start addressing these barriers with a view to favouring private-sector investment in the market development of wind energy in the medium-to-long term. Some of these barriers, namely those related to the transfer of nationally-appropriate wind energy technologies, will be addressed directly in conjunction with the baseline project. In order to generate market acceptance at a time when wind technology does not exist in Sudan, it is crucial to first demonstrate the technological viability of wind energy in the local context. Any technological*



*failure at the early stages in wind energy development will only undermine the acceptance of the technology in Sudan, resulting in an unwanted increase in yet more market barriers. Using the favourable conditions generated by the imminent Dongola wind farm to promote wind energy, other – broader – barriers will be addressed by the UNDP-implemented, GEF-financed project in order to pave the way for the market development of the Red Sea wind farm and beyond".*

**Option 1:** *(if no decision on the baseline funding by end of November 2017 was realized, then please trigger option 2)*

- **Pursue central government baseline project funding** – Sudan's central government has reiterated its commitment to this project and now intends to trigger funding a 5 MW baseline project to demonstrate grid-connected power generation from wind energy. This option has been pursued to three (3 years on 31 December 2017) and has stalled in previous attempts due to the reasons already mentioned earlier. It's of paramount importance with government reiterating its commitment during this MTR that if no firm funding availability has been confirmed from central government by the end of November 2017 that option 2 is triggered. Bureaucratic systems take time and the project is almost 3 years into implementation with only 2 years left and the timing of triggering a decision has now become very critical if outcome 1 demonstration ambition is to be achieved.

**Option 2:** *(if no decision on the baseline funding by early Dec 2017, then please trigger option 3 below)*

- **Scope change as project reallocates a proportion of its outcome 1 budget** – consideration can be given to reallocating a proportion of the projects outcome 1 budget line items to fund a 1MW grid-connected power generation from wind demonstration plant. This will assist with proving the concept and also the disbursements of the funds as the bulk of the budget is allocated towards outcome 1 and can't be disbursed because the baseline hasn't been implemented as originally planned from central government funds and resulting in the project not being able to spend. Quotations and company offers received by MWRE early in 2017 alongside desktop internet research indicates that a 1MW costing in the range of USD\$1.2 million to USD\$2.4 million.

**Option 3:** *(if no decision on the baseline funding by mid Dec 2017, then please trigger option 4 below)*

- **Scope change to small scale wind energy for water pumping** – Standalone of hybrid small scale wind turbines for water pumping as an opportunity to demonstrate grid-connected power generation from wind energy where grid refers to "power "grid," they're referring to the transmission system for electricity" (UCSUSA, 2015). Sudan has a history of wind energy (wind mills) being used to pump water for irrigation and other purposes stretching back from the 1980s. Given the baseline funding constraints, this is another option which can be used to demonstrate grid-connected power generation from wind for an electric grid, though decentralised in this instance. The GEF is already funding another demonstration project in the wind energy potential areas that's using solar energy for water pumping. Using wind could be another way of proving the concept and demonstrating how wind energy is equally good as a form of energy in these potential areas. This for example, is a community-based approach that provides opportunities for more awareness raising for wind energy as one type of a renewable energy source in order to keep mainstreaming low capital and low risk options in wind energy and renewable energy overall in Sudan. Increased awareness beyond the current levels will make it possible for the project to increase its coverage of promoting renewable energy adoption at the community level in Sudan. In the long term when the financial market confidence levels increase, large scale 100 MW capacity wind farms

like Dongola will become a lot easier to finance and smaller scale interventions will serve Sudan well by practically demonstrating its appetite and commitment towards renewables<sup>4</sup>.

**Option 4:** *(if no decision on the baseline funding by end of Dec 2017, high risk & triggers no further options)*

- **Scope change to small scale wind energy for demonstration at Universities** – standalone of hybrid small scale wind turbines for powering university campuses or university water pumping as an opportunity to demonstrate grid-connected power generation from wind energy where grid refers to "power "grid," they're referring to the transmission system for electricity" (UCSUSA, 2015)<sup>5</sup>.

### **Outcome 2: Policy and institutional regulatory framework adopted**

This is one outcome which has been highly appreciated and seen as the key to barrier removal by all the stakeholders. The project's role in enabling a Feed-in-Tariff (FiT) was greatly commended and appreciated as ground breaking. The policy reforms and harmonisation of legislation to enable a private sector driven wind energy market was also highly lauded by stakeholders and highlighted multiple times as something which wouldn't have been achieved if it wasn't for this project. Evidence on progress thus far shows that:

- The Environmental Impact Assessment (EIA) studies and reports were accomplished.
- The Feed-in-Tariff (FiT) policy document and NAMA project document and reports were produced.
- The policies and legislation for renewable energy are effectively adopted and enforced.

Overall, it's safe to conclude that at this MTR stage the policy, legislative and institutional regulatory framework has been well adopted to a large extent with a few action points that are being finalised over the final duration of the project.

**Recommendation:** PUSPG-WEP should aim to resolve the slight technicalities mentioned about a standardised FiT that makes it attractive for new entrants' players to enter the market at various scales. The private sector can play a significant role with complementation of households and small businesses that can generate renewable energy at various scales which can be fed into the grid during the day and vice-versa at night. Investors at all scales seeing the adopted policy, legislative and institutional regulatory framework in practice will also enable a community-based approach from technologies that can be benefited from. PUSPG-WEP's responsibility would be restricted more to making sure implementation is fully beneficial by adopting these renewable technologies in line with the policy, legislative and institutional regulatory framework. Otherwise, a negative reputation of the project might emerge when the technology is partially implemented and does not also fully provide the benefits to the local communities by also enabling smaller players to become active in the sector.

### **Outcome 3: The wind technology support and delivery system strengthened**

<sup>4</sup> A 25kW wind turbine produces enough energy to power a small neighbourhood. These devices are also intended for agricultural and light industrial applications. It has also been used for years in remote village applications, where diesel power systems supply electricity for a small grid.

<sup>5</sup> A 100kW wind turbine produces enough energy to power 15+ homes. These are not residential turbines but are community-sized wind turbine that produce the right amount of power for school and university campuses, residential developments, farms, municipalities, and a variety of businesses ranging from injection moulding factories to extrusion houses. They can also be used in small wind farms for direct grid hookup.

The wind technology support and delivery system has been strengthened with a lot of technical training and learnings being undertaken from similar projects and contexts elsewhere which is very good. Evidence on progress thus far shows that:

- 65 engineers were trained in wind technology (49 males and 16 females).
- Three (3) institutions have been supported in wind technology.
- Wind maps and atlas version 1.0 was developed.

**Recommendation:** As a medium-to-long term technology support and delivery system strengthening, the involvement of most of the institutions of higher learning and higher education from the potential wind farm locations needs to be strengthened. This should aim to build localised skills, capacity and expertise now that exists at a national level on aspects raised during the MTR like (1) wind energy planning; (2) wind assessment software; (3) Designing and assessing wind energy. Even if it's at their own costs through Master's and Doctoral students as a start – it triggers the technology support and delivery system strengthening from a very early stage of local graduates as the project can't simply rely on experts to come in from Khartoum for certain simple aspects which local well capacitated technicians can do. More of these localised institutions need to start becoming active players in the renewable energy sector and be part of the learnings of this process to build local capacity and capability within this sphere of expertise at a localised level. Hybrid-ing wind energy with solar on solar powered agricultural farms for water pumping to be financed by farm owners is another avenue which is explored with cooperation from Institutions of higher education will add value to the notion of wind technology support and strengthen the delivery system. This is an area that will be required on an ongoing basis beyond the construction phase of the Dongola wind farm as it determines how the local pool of expertise is developed for a stronger Sudanese renewable energy sector.

#### **Outcome 4: Adaptive learning and replication plan supported.**

Evidence on progress thus far shows that amongst others, one (1) study tour was undertaken to wind plants in Morocco (composition included 50% female and 50% male). In this component, the project also has another fifth outcome on project management where evidence on progress shows that:

- The project management unit was established and is operational.
- The project's Board representing (PB) different stakeholders was established and is operational.
- The project's Technical Committee (PTC) representing different stakeholders was established and is operational.

**Recommendation:** as part of Adaptive learning, the 100MW baseline project should be viewed as a learning curve and the learnings adapted by going for a lesser ambitious yet immediately fundable intervention to prove the concept as recommended in outcome 1 above. A changing context in transition which Sudan found itself in pre-project implementing and now during implementation requires adaptive learnings to be drawn out of it and that the replication plan factors this risk very well and how it can be mitigated. Adopting a targeted approach for the remaining Adaptive learnings to be offered towards an identified niche would be more strategic and impactful. No desktop baseline survey on renewable energy skills or expertise required in the sector in Sudan was done for this phase of the project for the different stakeholders. Only the Electricity Regulatory Authority (ERA) submitted a list whilst the rest of the other stakeholders didn't. It's worth having a survey done (*even if it's a simple desktop exercise in consultation with the institutions of higher learning and education*) to guide targeted training prioritisation. So that the training and capacity building interventions going forward are more targeted and adapted to the immediate gaps/needs as a range of useful skills development has been undertaken thus far as intended.

## Conclusions

The mid-term review team concludes that PUSPG-WEP is on target to achieve most of the results that are intended by the project for both the medium-long-term. The grid-connected power generation from wind farm process in Sudan has begun to be established which is the outcome prone to a higher risk than the rest of the outcomes due to 100MW baseline financing whose reasons and mitigation measures have already been explained under outcome 1. However, this baseline risk has been noted with measures to mitigate the risk being suggested through four logical options that can be undertaken as part of adaptive management which will render the overall project a success at its end. This project thus far has led to strengthened institutions to progressively deliver universal access to basic services that are aligned with latest UNDP Strategic Plan in Sudan and aligns to the next generation Poverty Reduction Strategy Plan (PRSP) that Sudan is finalising.

In addition, early signs suggest that in the short – medium term the project has seen improved progress on the wind farm construction at the Dongola site. Experience sharing and exposure visits on successful power generation from wind farm practices has created good insights for good international standards and practice benchmarking for those involved on the project. Very strong local partnerships between the various stakeholders have been established and adequate progress has been made towards getting local Sudanese stakeholders to own the project. MWRE has even gone to the extent of creating a general directorate for this project's work and the renewable energy sector much more broadly. The training of personnel though welcomed as part of the project isn't doing justice to the current ripe atmosphere of demand for renewable energy sources that Sudan is showing. This makes the need to have a grid feeding demonstration wind turbine of paramount importance as one can't guarantee that trainees from this project will stay on without any wind farm to work on and learn from. The failure of not having any wind energy system feeding into the grid isn't giving a positive reflection on the intent even though the policy and legislative foundation has been laid down –having a wind turbine feeding into the grid irrespective of Mega Watt scale will send positive signals to the market and the renewables sector in Sudan which will trigger more investment interest as investors (domestic and abroad) would have seen Sudan's first wind farm feeding into the grid.

Overall, a cross-sectoral and forward-looking approach that satisfactorily considers the integrated and inter-related impacts such as budget reprioritisation is evident. Without this cross-sectoral approach, strategic cost-effective alternatives, such as project budget reallocation would not necessarily have been considered.

## Lessons learned

The implementation of the PUSPG-WE project has yielded a number of lessons that will be useful for the design of future GEF funded projects as well the implementation of similar projects in Sudan stemming from the project's main challenges around budget allocation and efforts to finance the overall project.

1. Even though the Government of Sudan is committed to support this project, its conception has to consistently pay special attention to the stiff US economic sanctions against Sudan for the last 19 years which have made it very difficult to obtain sustainable financing for the baseline project.
2. Stakeholders are interested in seeing the technology working on Sudanese soil irrespective of scale. This has made the need to have some kind of grid feeding demonstration wind turbine constructed in Dongola more vital to avoid the risk of weaning demand on renewables after so much capacity, hype and awareness raising had been successfully done.

3. People want to see things work and for a demonstration project, the demonstration is what stakeholders are looking out for.
4. Consultancy services or consultancy work is very costly and has skewed the project's budget significantly high for Outcome 1 (*by more than 63%*) and Outcome 3 (*by more than 54%*) of each of the proposed budget for the individual outcomes respectively. This is an indication that the initial project's budget distribution amongst the project outcomes was not realistic and this mid-term is the appropriate time for budget review and reallocation to avail more funding for urgent activities that support the achievement of the project's development objectives in the long run.
5. At times physical infrastructure projects come with unforeseen challenges which can be beyond the control of the project itself yet hamper progress in terms of delivery of the projects intended objective(s).
6. A shared vision is important as with challenges along the way, every interested party still hangs onto what the vision is and works towards that as evidenced by commitment all round by these project's stakeholders to ensure that the project delivers on its objectives no matter what.

## 2.0 Introduction

### 2.1 Background

Like many developing countries, Sudan has a shortage of electricity. Approximately 35% of the population has access to electricity (MWRE-Renewable Energy Master Plan 2013). Even then, it is not reliable and experiences regular power outages. Hydro-power has the largest share of energy generation. The potential to expand hydro-power to meet future needs is limited. Sudan does not have significant oil or gas production and as a result will have to turn to importation of fossil fuels to meet future energy needs. Climate change threatens to affect rainfall patterns on which Sudan relies for the water that generates its hydro-power. This further emphasises the need for Sudan to diversify its energy sources.

Sudan currently has a generation capacity of 2,723 MW of power (ibid), has no wind generation capacity and no grid-connected solar capacity. Publicly-owned utilities own all of the power generation facilities, transmission and distribution lines in Sudan. The Government owns 5,984 km of 220 kV transmission lines and 965 km of 500 kV transmission lines. Approximately 35% of Sudan's population has access to electricity<sup>6</sup>. In 2012, the power consumption per capita was 233 kWh/ year.<sup>7</sup> There are no independent power producers (IPPs) in the country; though initiatives are underway to promote private investment in power generation. This project seeks to support those initiatives where they relate to wind power.<sup>8</sup>

In 2012, the power transmission losses were approximately 4%, and distribution losses were approximately 18%, such that, in total, roughly one-fifth to one-quarter of the electricity generated is lost in transmission and distribution.<sup>9</sup> As a result, Sudan must generate 25% to 33% (MWRE 2013 – Long Term Power System Plan) more power than is consumed to overcome the transmission and distribution losses, and, in the process, emit associated greenhouse gases.

Forty-four percent of Sudan's electricity is generated from fossil fuels. The principal fossil fuels currently used for Sudan's power generation are heavy and light fuel oils, with shares of 61% and 39% respectively of the fossil fuel used for power generation in Sudan.<sup>10</sup> Hydro-power plants represent 56% of Sudan's installed power generation capacity, more than any other technology.<sup>11</sup> To meet the Government's target of 75-80% electrification by 2031, the Government plans to install 12,000 MW of additional generation capacity by 2031. This is to include 1,582 MW of renewable energy (other than large-scale hydro-power), with approximately 650 MW of wind energy.<sup>12</sup>

The Promoting Utility Scale Power Generation from Wind Energy project (PUSPG-WEP) was designed to support the removal of barriers to the adoption of utility-scale wind energy tied to the national grid in Sudan. Wind energy has been identified as a priority mitigation technology by the Government of Sudan, and, although it is a mature technology globally, it has not yet been adopted in Sudan. A systems approach is proposed to integrate energy policy analysis within the broader developmental objectives of Sudan. The project will also establish regulatory frameworks for encouraging private investments in grid-connected wind

<sup>6</sup> UNESCO (2009), *Electricity Access Rates*.

<sup>7</sup> Arab Union of Electricity (2012), *Statistical Bulletin*.

<sup>8</sup> RCREEE (2013), *Arab Future Energy Index*.

<sup>9</sup> Arab Union of Electricity (2012), *Statistical Bulletin*.

<sup>10</sup> Arab Union of Electricity (2012), *Statistical Bulletin*.

<sup>11</sup> Government of Sudan (2013), *Second National Communication to the UNFCCC*.

<sup>12</sup> Lahmeyer International (2013), *Long and Medium-Term Power System Plans of Sudan*.

energy. Sudan currently has plans to develop utility-scale wind farms in four regions: Dongola in the North, Nyala in the South, the Red Sea coastal region and Khartoum. Against this background, Promoting Utility Scale Power Generation from Wind Energy project was designed and launched with a development objective that includes four components.

## 2.2 Description of the project

The Promoting Utility Scale Power Generation from Wind Energy project in Sudan includes four components: the implementation of an initial wind farm; support to policy and regulatory development, particularly to encourage private sector participation; strengthening the support for wind technology in the country and support an adaptive learning and replication plan. Support to the implementation of the first wind farm in Sudan, Dongola, will align the wind farm with international best practices. It will also create a case study for replication in later wind farms. The Dongola wind farm will be implemented in five phases over the lifetime of the UNDP-implemented, GEF-financed project. This phasing will allow lessons-learned in it to be applied in the later phases and, perhaps more importantly, will provide five years of continuous wind farm construction-commissioning-operation that will serve as a laboratory for training personnel and developing associated tools and guidelines. The opportunity to have such continuous exposure is very rare and will assist in transferring knowledge and experience to neighbouring countries.

The project aims to help diversify Sudan's power sources and reduce its reliance on fossil fuels, particularly for future expansion and to reduce greenhouse gas (GHG) emissions. The project will therefore help increase Sudan's energy security and support its development. The project has been designed to play a catalytic role in this transformational scaling-up of wind energy, and renewable energies more broadly.

The project provides a series of distinct and coordinated initiatives to achieve:

- Support for the construction of the Dongola wind farm in a manner that follows international norms and best practices with respect to the wind farm and the electricity grid;
- Support for a regulatory framework that paves the way for the implementation of wind farms throughout Sudan to help meet the country's energy needs for sustainable development through Government and private-sector participation;
- Capacity building to establish the technical and regulatory capacities within Sudan to promote the development of wind farms;
- A replication plan to both promote the replication of wind farms throughout Sudan and support their replication by providing distilled lessons and tools from the implementation of 100 MW at Dongola wind farm.

The project's main components were:

Outcome 1: Grid-connected power generation from wind farm introduced.

Outcome 2: Policy and institutional regulatory framework adopted

Outcome 3: The wind technology support and delivery system Strengthened

Outcome 4: Adaptive learning and replication plan supported

In accordance with the GEF-5 Climate Change Focal Area Objective #3, to "Promote Investment in Renewable Energy Technologies", the key success indicators of the project are:

- The extent to which policies and regulations for RE are adopted and enforced;
- The volume of investment mobilised; and
- The number of tonnes of CO<sub>2</sub>-equivalent avoided.

The project specifically aims to achieve the following:

- Installation of the 100 MW Dongola wind farm, while ensuring a stable grid connection.
- Replication of lessons from Dongola for the Nyala, Khartoum and Red Sea wind farms.
- Development of a comprehensive set of policies and regulations to encourage investment in wind power in Sudan.
- Completion of technical and regulatory standards needed for connection of private-sector power generators to the grid.
- Development of a wind resource map for Sudan, coupled with other geographical information, such as bird flights, to determine optimal areas for development.
- Development of a NAMA around a spatially-differentiated feed-in tariff.
- Development of a “one stop shop” within the Government to streamline the project development process.
- Development of human capacity, through training, workshops and advanced study curricula, to support wind farm projects.

### 2.3 Purpose of the mid-term evaluation

The Mid-Term evaluation is intended to provide a comprehensive overall assessment of the project in order to provide opportunity to critically assess administrative and technical strategies, issues and constraints associated with implementation. The evaluation gives recommendations to improve the potential of the Project to achieve expected outcomes and meet objectives within the Project timeframe.

While according to UNDP-GEF Monitoring and Evaluation (M&E) procedures were conducted continuously throughout the lifetime of long term projects by implementing agencies, mid-term reviews (MTRs) are implemented to meet the following objectives: i) to assess progress being made towards the attainment of project results and impacts as set out in the project document; ii) to provide a basis for decision making on necessary amendments to achieve the overall objectives of the project within the time frame; iii) to assess the effectiveness, efficiency and sustainability of the project and promote accountability for resource use; and iv) to document and disseminate initial lessons learned. It is in this context that the Promoting Utility Scale Power Generation from Wind Energy project in Sudan was subjected to a mid-term review (MTR).

The overall objective of the MTR is to assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. This report documents the findings of the Mid-term review of the Promoting Utility Scale Power Generation from Wind Energy Project in Sudan implemented through the Ministry of Water Resources and Electricity with support from the United Nations Development Programme-Global Environment Facility (UNDP-GEF) since Jan. 1, 2015. The PUSPG-WE project will be implemented over a period of five (5) years until Dec. 31, 2019 and as per UNDP-GEF project management requirements, a



mid-term review was to be conducted. UNDP Sudan Country Office commissioned this review with the involvement of the Ministry of Water Resources and Electricity in Sudan as the executing agency under the National Execution Modality.

The progress towards the achievement of the Project Development Objective PDO which is “to overcome barriers to the market development of utility-scale wind farms in Sudan” is being assessed. This Mid Term Review is a planned activity that has the following specific objectives:

1. Review progress, efficiency and effectiveness of the Project implementation in terms of achieving project objectives, outcomes and delivering outputs.
2. The extent to which the project implementation approaches/strategies are contributing to the sustainability of the interventions.
3. Examine the time frame for implementing the remaining activities (considering project ends December 2019).
4. Review the financial and fiduciary aspects of the project.
5. Provide recommendations for corrective actions for the Project/Organisation’s management, government of Sudan and GEF as donor.

The objective of the project is to reduce greenhouse gas (GHG) emissions by promoting the use of wind energy in Sudan. The project will provide direct technical assistance to the Dongola wind farm and will aid in the replication of experiences from the Dongola wind farm to be applied to the Red Sea wind farms and subsequent wind farms. The project also aims to put in place legislation and a framework to promote private sector involvement in renewable energy in Sudan. An outcome of the UNDP-implemented, GEF-financed project is to enable the Government of Sudan to tender future wind farms as IPP projects.

#### 2.4 Methodology of the mid-term review (MTR)

The MTR was conducted in a consultative, participatory, and cross learning approach that recognizes targeted stakeholders as active agents of change in the field of wind energy promotion and who have the potential power to support the achievement of the project’s universal and immediate goals. A team made up of an International Consultant and a National Consultant conducted the MTR of the PUSPG-WEP and [Error! Reference source not found.](#) Annex 4 highlights the MTR Methodology Matrix. To that end the MTR was based on both office and field work in Khartoum and Dongola for collection of primary data of both qualitative and quantitative nature.

The team used a variety of techniques including:

- a) Literature reviews where the MTR team reviewed documents including national policy and legal documents that provide the enabling framework for project implementation, the PUSPG-WE project documents and the various reports that have been produced by the project implementing entities to date including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, quarterly reports, national project steering committee meeting minutes, project budget revisions, lesson learned reports, national strategic and legal documents, LPAC meeting minutes, field survey reports, and any other materials that the team considers useful for this evidence-based review).
- b) Stakeholder interviews, and

- c) Field visits to project implementation sites.

## 2.5 Structure of the Mid-term Review (MTR) Report

This report is divided into chapters to meet the desired objectives as set in the ToR for this mid-term evaluation (see [Annex 1: MTR TOR \(excluding ToR annexes\)](#)~~Annex 2: MTR TOR (excluding ToR annexes)~~). Chapter 1 is an Executive Summary while Chapter 2 is an Introduction that provides general background and a brief overview of the project, purpose of the evaluation, key issues addressed and the methodology used in conducting the MTR. The PUSPG-WE project is described in Chapter 3. This chapter also provides an analysis of the context within which the project was developed. This includes the problems that the project was designed to address, its immediate and development objectives, the main stakeholders involved in the implementation of the project as well as the outcomes and or results expected from the process.

Chapter 4 analyses the main findings of the evaluation focusing on issues of project design, its responsiveness to national and global environmental priorities and the extent to which national stakeholders were involved in the implementation of the project. Chapter 5 provides an analysis of the results achieved in implementing the project at mid-term. This includes financial planning and management and assesses whether project resources were used in an effective manner. This chapter also discusses the extent to which the project has met its intended objectives and provides a rating of specific project elements against targets set at project inception. Chapter 6 discusses recommendations and conclusions from the mid-term review exercise. Finally, the lessons learnt from the implementation of the PUSPG-WEP that could be useful in the design of similar projects in future are given in Chapter 7, and Chapter 8 is a record of the Annexes to the MTR report.

## 3.0 The Project and its Scope

The Promoting Utility Scale Power Generation from Wind Energy in Sudan Project (PUSPG-WEP) commenced implementation in Jan 2015. The project is to be implemented over a five-year period ending in Dec 2019. The project is being implemented by Ministry of Water Resources and Electricity in partnership with UNDP.

The Ministry of Water Resources and Electricity (MWRE) has succeeded the Ministry of Electricity and Dams (MED) as the body responsible for the electricity sector in Sudan. MWRE is planning the installation and commissioning of four utility-scale wind farms by 2020: Dongola (100 MW), two Red Sea wind farms (Tokar and Port Sudan, 180 MW), Nyala (20 MW) and Khartoum (20 MW).<sup>13</sup> This time-frame coincides with the implementation of the UNDP-implemented, GEF-financed project.

For the purposes of the Global Environment Facility, the baseline project consists of the Dongola and Red Sea sites. Hence, the baseline project has a total installed capacity of 280 MW that is expected to produce 849,695 MWh of renewable electricity annually when all the sites are operational. The cost of these wind farms is approximately US\$523 million.

<sup>13</sup> Following the guidance of the GEF Secretariat during PIF review, the Dongola and Red Sea wind farms form the baseline project for the purposes of the UNDP-implemented, GEF-financed project. The Nyala wind farm is excluded: it is relatively small, is due to commence after Dongola (and hence lacks Dongola's symbolic importance as Sudan's first utility-scale wind farm), and has few additional learning or replication benefits beyond those provided by the Dongola wind farm. Moreover, the Nyala wind farm is connected to a local grid but not the national grid and hence lacks national impact and does not offer potential lessons-learned from integrating wind energy into the national grid.

### 3.1 Shortages of electricity issues and opportunities in Sudan

Like many developing countries, Sudan has a shortage of electricity. Approximately 35% of the population has access to electricity (MWRE-Renewable Energy Master Plan 2013). Even then, it is not reliable and experiences regular power outages. Hydro-power has the largest share of energy generation. The potential to expand hydro-power to meet future needs is limited. Sudan does not have significant oil or gas production and as a result will have to turn to importation of fossil fuels to meet future energy needs. Climate change threatens to affect rainfall patterns on which Sudan relies for the water that generates its hydro-power. This further emphasises the need for Sudan to diversify its energy sources. The PUSPG-WE project seeks to address these problems and focuses on promoting the use of wind energy in Sudan.

### 3.2 Problems the Project seeks to address

Sudan currently has a generation capacity of 2,723 MW of power (ibid), has no wind generation capacity and no grid-connected solar capacity. Publicly-owned utilities own all of the power generation facilities, transmission and distribution lines in Sudan. The Government owns 5,984 km of 220 kV transmission lines and 965 km of 500 kV transmission lines. Approximately 35% of Sudan's population has access to electricity<sup>14</sup>. In 2012, the power consumption per capita was 233 kWh/ year.<sup>15</sup> There are no independent power producers (IPPs) in the country, though initiatives are underway to promote private investment in power generation. This project seeks to support those initiatives where they relate to wind power.<sup>16</sup> Against this background, the main objective of the project is addressing shortages of electricity in Sudan by promoting the uptake of wind energy.

### 3.3 Project Goal and Objectives

The goal of the project is to support Sudan to reduce greenhouse gas (GHG) emissions by promoting the use of wind energy in Sudan. The project will provide direct technical assistance to the Dongola wind farm and will aid in the replication of experiences from the Dongola wind farm to be applied to the Red Sea wind farms and subsequent wind farms. The project also aims to put in place legislation and a framework to promote private sector involvement in renewable energy in Sudan. An outcome of the UNDP-implemented, GEF-financed project is to enable the Government of Sudan to tender future wind farms as IPP projects.

This project provides a series of distinct and coordinated initiatives to achieve: i) support for the construction of the Dongola wind farm in a manner that follows international norms and best practices with respect to the wind farm and the electricity grid; ii) support for a regulatory framework that paves the way for the implementation of wind farms throughout Sudan to help meet the country's energy needs for sustainable development through Government and private-sector participation; iii) capacity building to establish the technical and regulatory capacities within Sudan to promote the development of wind farms; and iv) a replication plan to both promote the replication of wind farms throughout Sudan and support their replication by providing distilled lessons and tools from the implementation of Dongola.

<sup>14</sup> UNESCO (2009), *Electricity Access Rates*.

<sup>15</sup> Arab Union of Electricity (2012), *Statistical Bulletin*.

<sup>16</sup> RCREEE (2013), *Arab Future Energy Index*.

### 3.4 Project Management and Implementation Arrangements

The National Execution modality is being applied, executed by the Ministry of Water Resources and Electricity, under the National Implementation Modality (NIM). UNDP is accountable for the disbursement of funds and the achievement of the project goals, according to the approved work plan. The executing agency has assigned a senior officer as a Government Project Coordinator to: (i) coordinate the project activities with activities of other Government entities; and (ii) certify the expenditures are in line with approved budgets and work-plans.

**A Project Board (PB)** was established at the inception of the project to monitor project progress, to guide project implementation and to support the project in achieving its listed outputs and outcomes. It is chaired by a MWRE representative and includes representatives from UNDP, NERC, ERA, MWREPD, SSMO, SBEF, HCENR MFNE, and a Project Assurance Officer from UNDP. Other members can be invited at the decision of the PB on an as-needed basis, but taking due regard that the PB remains sufficiently lean to be operationally effective. The final list of the PB members was completed at the outset of project operations and presented in the Inception Report by taking into account the envisaged role of different parties in the PB. The composition of the project Board is as follows:

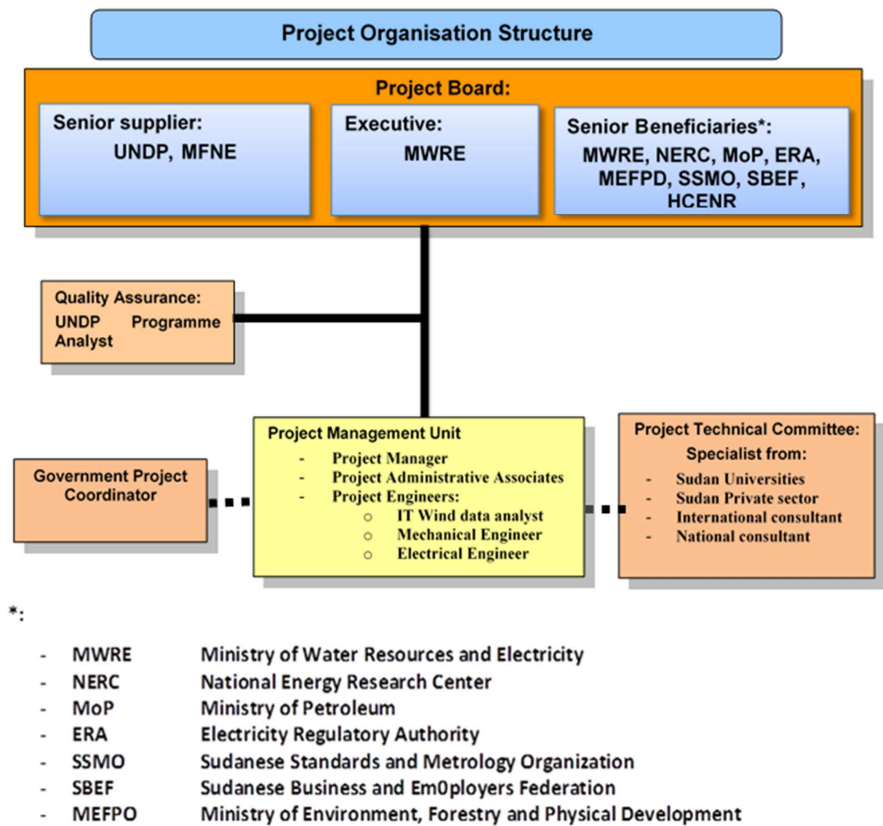
Nº	Name	Title/Entity
1	Musa Omer Abulgasim	Undersecretary, MWRE Project BOA
2	Abdalazim Widaa	MOP
3	Mohammed Osman Mahgoob	STPG
4	Salaheldin H.Elgaabo	G D Planning, MWRE
5	Min Huttin	UNDP
6	Nouralla Yassin Ahmed	UNDP
7	Mohmed Ahmed Mohamed	Secretary General, ERA
8	Abdal Hafiz Fadallah Babikir	Director, ERA
9	Nawal Hassan Mohamdain	Section Head, MOFNE
10	Manal Omer Ali	Program Officer, MOFNE
11	Elfadil Birama	NERC
12	Hana Hamdalla	HCENR
13	Yasir Abdalla Saeed	RE Director, MWRE
14	Hind Elamin Elnour	MWRE
15	Amin Sabri Ahmed	SSMO
16	Abdalatti Osman	Director, MIC
17	Ekhlas Mohamed Ali	Director, MIC

The project manager participates as a non-voting member in the PB meetings and is also responsible for compiling a summary report of the discussions and conclusions of each meeting. The PB meets on a regular basis during project implementation, at least twice per year, and it will have the responsibility of coordinating and harmonizing the actions of all the key stakeholders.

**The project Management Unit (PMU):** The PMU is composed of a National Project Manager (NPM), Finance and Administrative Officer, a Monitoring and Evaluation Expert (M&E) and three engineers. The PMU is responsible for the day-to-day management of the project activities and is accountable to the PB. The Project Management Unit's overall role is to ensure comprehensive technical and management support

is provided to project activities and local beneficiaries, such as overseeing knowledge management and Monitoring and Evaluation. The PMU has adequate multi-disciplinary technical capacity to be able to support technical, financial and assurance-related activities. The PMU is established within MWRE and coordinates its work with UNDP and other stakeholders. The Project Manager reports mainly to MWRE and shares reports to UNDP and the PB. The Terms of Reference of the key project personnel are presented in Annex 8.3 of the Project Document. The project personnel were selected on a competitive basis in accordance with the relevant UNDP rules and procedures and in consultation with the UNDP-GEF Region-based Technical Advisor.

Figure 1: Project Operational Structure



The project also has a **project technical committee (PTC)**. The PTC is an advisory body supporting the project management unit to implement the project document on a scientific and knowledge based manner. It represents a think-tank for the project implementation. The PTC is responsible for all aspects of the technical specifications and processes whose composition is as follows.

Nº	Name	Institution
1	Mohmaed Osman Sidahmed	Sudan University
2	Elfadil Braima Hamid	NERC
3	Abdul Hafiz Fadalalla	ERA
4	Amin Sabri	SSMO
5	Hanna Hamdalla	HCENR
6	Abdul Azim Widaa	GDEA
7	Manal Omer Ali	MIC
8	Noralla Yasin	UNDP
9	Hind Elnur	MWRE
10	Yasir A Said	MWRE
11	Hassan Abdall	Solar Man Co
12	Gamela Omer Ahmed	MOFNE
13	Abdelaati Gabir Elhag	MIC
14	Mohamed Sidahmed Abdalla	SETCO
15	Mahjoub Eisa Khalil	MWRE

The PTC is responsible for day-to-day oversight and coordination of implementation of project activities including recruitment and supervision of technical and training expertise as required for implementation of the project. The PTCs reports to project board and maintains liaison with UNDP.

The PMU is responsible for coordinating the preparation and presentation of reports to NSCPB and UNDP on a regular basis (including Annual Project Reports, Inception Report, Quarterly Reports and the Terminal Report).

### 3.5 Project timing and milestones

The project's timing is opportune and appropriate, as Sudan has to act now and start building its climate resilience by investing in green energy and improving access by needy communities to sustainable energy. The project was initiated at a time when strategically Sudan is embarking to understand the planning and operational requirements of wind power, to gain experience with installation and grid integration issues, and to employ policy options that promote wind energy development within the broader context of low-carbon, climate-resilient development to catalyse climate finance. Moreover, this project thereby creates the appropriate technological, institutional, policy and capacity environment that will enhance the probability of success of the baseline wind farms and establish the pre-conditions for replication elsewhere in Sudan. A participatory process of making the country's economy green and climate resilient initially was planned to be undertaken under the ownership of MWRE and its other line ministries that are required to make this vision possible. Based on these facts the timing of the project was perfect and the milestones are realistic and being satisfactorily achieved as expected.

### 3.6 Main stakeholders baseline analysis

A comprehensive stakeholder identification process was embarked upon at the time of the design of the PUSPG-WE project. Stakeholder consultation has been a key feature in the design of this LDCF Proposal,

and stakeholders have been involved in identifying and prioritizing the proposed intervention activities. The project interventions involve agencies (e.g. NERC, ERA, MWREPD, SSMO, SBEF, HCENR MFNE, UNDP). To ensure the proposed project was grounded in local realities whilst aligned to national policy, the project preparation phase involved extensive consultations held in Sudan with MWRE and the North State Government where the planned Dongola farm is located. Then MWRE confirmed that the issue of the interface electronics had not been considered (or budgeted for) for any of the baseline wind farms, and that the now-completed tender process for the Dongola wind farm reflects this omission. Further, MWRE specifically emphasised the need for GEF assistance in this area. In the absence of such interface electronics, it is highly probable that the grid will face islanding problems that will lead to load management problems and further grid instabilities. As a result of the extensive stakeholder consultations and comments received, which are reflected in the project design, the project has considerable ownership by the relevant entities and stakeholders in Sudan.

### 3.7 Results expected

PUSPG-WEP is being implemented to overcome barriers to the market development of utility-scale wind farms in Sudan. The project will help Sudan introduce grid-connected power generation from a wind farm and by providing capacity development for policy, institutional and regulatory framework. The project proposal was designed to support adaptive learning and replication plan and strengthen wind technology support and delivery system.

#### 3.7.1 Grid-connected power generation from wind farm introduced

The UNDP-implemented, GEF-financed project will advance the baseline scenario in Sudan by creating a technical and regulatory basis for the development of wind power specifically and renewable energy in general, as many of the underlying regulations are similar. The project will support existing initiatives, such as the draft Electricity Law, the Investment Law, and the application of lessons-learned in Dongola in the construction of the Nyala and Red Sea wind farms. The experiences gained in Dongola should serve to reduce the risk of investing in wind farms in Sudan and help encourage private-sector investors to participate.

At present, the installation of 100 MW capacity in Dongola was not achieved due to many reasons some of which are out of the hands of the project team. The installation of four (40 wind farms by the Ministry of Water Resources and Electricity (MWRE) was also not realised due to the fact that the base line project was not implemented due to funding constraints.

In the long term, the Dongola wind farm will be owned and operated by MWRE. Future wind farms, in particular the planned wind farms on the Red Sea, are intended to be privately owned and operated as IPP projects, provided the appropriate legislation, guidelines, regulations and experience are in place to support their development as such. For this to be successful in the longer term (i.e. outside the project timeframe) needs consideration of:

- The requirements for differentiated support for IPPs are promoted.

- Combining technologies that have private investment value/potential, with risk reducing measures (like credit or local renewable energy parts manufacturing) that creates an environment for IPPs to experiment and adapt in a way that enhances their adopting of wind energy.

For this project to contribute to a long-term solution, these packages of support and the learning derived from the testing should then be costed and scaled-up, either through leveraging private sector scale up investments through adoption by the national-scale renewable energy development programmes or through emerging renewable energy finance mechanisms. The experience of the financial mechanism for solar powered irrigation pumps is an example to follow.

To effectively influence the large national scale-up programme's efforts will require field level interaction to build a strong evidence base of effectiveness in bringing renewable energy benefits and on-going national engagement between this project's Steering Committee and the steering committees of its sister programmes and projects.

### 3.7.2 Policy, institutional and regulatory framework adopted

To support improvements in policy, institutional and regulatory framework, there will be a need for effective institutional capacity to design, plan and support implementation. During the MTR Phase, the following needs have been achieved: Environmental Impact Assessment (EIA) studies and reports were accomplished. The FiT policy document and NAMA project document and reports were produced whilst the policies and legislation for renewable energy are effectively adopted and enforced. Taking a holistic-level approach to a policy, institutional and regulatory framework facilitates an incentive-based focus with certainty amongst stakeholders to invest which is attractive as a long-term solution.

### 3.7.3 The wind technology support and delivery system Strengthened

Through a combination of long- and short-term technical assistance initiatives, national governments can strengthen and build wind technology support and delivery systems. Facilitating the development or strengthening of wind technology cannot be achieved without an adequate of skilled artisans and institutional delivery systems. 65 engineers were trained in diversified wind technology (49 males and 16 females) (see table), three (3) institutions were supported in wind technology while wind maps and atlas version 1.0 were produced as part of wind technology support and delivery system strengthening which can build a solid platform to demonstrate and test the wind technology in local conditions.

### 3.7.4 Adaptive learning and replication plan supported

In the face of wind energy being in its infancy in Sudan, a study tour was undertaken to wind plants in Morocco by a group from Sudan (*which included 50% female and 50% male*). The main impact of the tour across all target skills will be on learning and replication systems.

## 4.0 Mid-term review Findings and Conclusions

### 4.1 Introduction

This MTR analyses the baseline problems that the project seeks to address in line with its development objectives. The project's performance has been made by evaluating project performance against the targets for the mid-project period through the indicators. The report followed the ToR, and covers three main areas:

- (i) Project Delivery



(ii) Project Implementation

(iii) Project Finances

#### 4.2. Key Observations from Stakeholder and Project Staff Interviews.

- Project is proceeding according to expectations of interviewed stakeholders;
- There is good contact between UNDP/GEF project office and stakeholders;
- Timing of project (delayed start of the projects office recruitment) could have an impact;
- Project has had significant impact with local stakeholders by providing support for building local capacity;
- There is good communication between project team and stakeholders at all levels except the complaint raised at regional level;
- There is a lot of published outputs on WEPSP website that can be of significant benefit – especially as teaching material and learning materials for university students;
- The project is viewed as having an impact at local and national levels;
- The need to get the grid feeding baseline going in reality even if it's at a very small scale has been constantly raised and flagged as critical for the future of the renewables sector in Sudan;
- The Stakeholder engagement on this project has been highly satisfactory and it's evident by the manner of participation and commitment that all the relevant stakeholders are putting towards implementing the project.

In a nutshell tables 2– 5 summarise the mid-term stage progress that the project has made towards meeting the set targets.

#### 4.3. Project delivery, Outputs and Outcomes

Table 2: Project performance under Outcome 1

Activity	Done	Not done	In progress
<b>Outcome 1:</b>			
<b>Power Generation from Wind Energy Resources Increased</b>			
<b>Sub-outcome 1.1:</b>			
Assist in the planning and procurement of baseline wind farm			<ul style="list-style-type: none"> <li>• Contract for construction of the access road to the Dongola wind Farm was signed. 80% of construction work was done.</li> <li>• Land ownership certificate was issued.</li> <li>• A state of the art wind mast (86 m high) was installed at the site.</li> <li>• Operate and Generate Electricity license for</li> </ul>

			Dongola wind farm was issued.
Conduct detailed grid study for the baseline wind farm		The Baseline project was not realized	
Training on project management and implementation.	<ul style="list-style-type: none"> <li>- Wind farms and contracts management training</li> <li>-NAMA Academy Fall 2015 in workshop.</li> <li>-Formulating proposals for low carbon climate resilient development: Designing Green Climate Fund (GCF) Projects in Netherlands. workshop</li> </ul>		
<b>Sub-outcome 1.2:</b>			
Establishment of baseline for calculating and updating the national grid emission factor	training to update existing grid factor		
Development of Red Sea EIA	<ul style="list-style-type: none"> <li>- Completion of Dongola EIA gaps (MSB) and performing Red Sea (MSB)</li> <li>- Red Sea EIA study completed</li> </ul>		
Development of FiT policy NAMA for Wind Power in Sudan			Contract with Local consultant was made, TOR of International consultant was published and recruitment is pending with UNDP

- The main objective of outcome 1 is to assist in increasing the share of the power generation from wind energy resources in the national grid. In this regard, the project was able to work out with the Government of the Northern State, the necessary paper work for the allocation (land ownership certificate) of the site where the baseline project near Dongola would be based. The project installed a wind mast (86 m high) at the site. The project successfully acquired the "Operation and Generation of Electricity from wind farm license" from ERA for Dongola wind farm.
- The project was able to get financing from the Ministry of Finance and National Economy as a grant equivalent to USD 800,000 towards the construction of the access road from the main highway to the site (4.7 Km). The technical committee drafted the ToR, selected the contractor and signed the contract with the winning company. The company received the first payment and started the construction and completed around 80% of the access road.
- The project conducted successfully a training module on wind farms and contracts management. 2 participants attended the training workshop from the different project stakeholders.
- The project conducted a successful training to update the existing grid factor. 3 participants from the different project stakeholders attended the training.
- The project participated in a training program on NAMA Academy Fall 2015 in Copenhagen, Denmark for 1 participant.
- The project participated in a workshop on Grid Integration of RE Power Generation Systems in Amman, Jordan for 2 participants.
- The project participated in a training program on Formulating proposals for low carbon climate resilient development: Designing Green Climate Fund (GCF) Projects in Netherlands for one participant.
- The project contracted a wildlife expert to perform EIA for the following studies: "Gaps related to Migratory Soaring Birds (MSB) in Dongola wind farm with Emphasis on mitigation measures" and "Possible Impact of onshore Wind Farms on MSB along the Red Sea Coast".
- The project prepared the ToR, selected the consultant and contracted the winning consulting firm to develop the Red Sea EIA. The consultant produced the final report and presented it to a validation workshop that was attended by the different project stakeholders. The final report was approved and its recommendations would be adhered to in the development of the Red Sea wind farm.
- The project prepared the ToR, selected and contracted the local consultant to Develop the FiT policy NAMA for Wind Power in Sudan. The consultant submitted the inception report and is developing the draft final report. The draft final report would be presented to a stakeholder's consultation workshop.

**Table 3: Project performance under Outcome 2**

Activity	Done	Not done	In progress
<b>Outcome 2: Policy, institutional and regulatory framework adopted</b>			
<b>Sub-outcome 2.1: Formulated long-term energy policy and regulations for Sudan</b>			
Establish communication links with project partners	technical committee members		
Evaluation of existing legislation and regulation for private sector involvement in grid-connected REs			IPP local consultant report

Survey of policies and codes within the East African Power Pool members.			Recruitment for IC to review Sudan Grid code. National consultant was contracted
Support the Integration of policies and codes compatible with EAPP members			
<b>Sub-outcome 2.2: Developed and endorsed standardized Power Purchase Agreement</b>			
Assist in the development of PPA for Sudan	standardized Power Purchase Agreement (PPA) for grid-connected renewable energy projects was completed		
<b>Sub-outcome 2.3: Established and approved dynamic, geographically-zoned feed-in tariff</b>			
Assist in the development of FiT systems for SUDAN			- Recruitment for IC to review and update FiT is under process by UNDP. - National consultant is under contract.
<b>Sub-outcome 2.4: Adopted and approved secondary legislation relevant to wind energy</b>			
assist in the development and implementation of IPP Act for investors in Wind Energy projects			- Recruitment for IC to develop IPP Act.is under process by UNDP. - National consultant was contacted and completed his preliminary study assignment.
<b>Sub-outcome 2.5: Formulated and adopted grid code</b>			
Assist in the development of Grid-code for Sudan			- recruitment for IC to review Sudan Grid code was completed. And started his assignment. -National consultant was contracted and started his tasks.
<b>Sub-outcome 2.6: Established an operational inter-ministerial High Committee for wind energy.</b>			
<b>Sub-outcome 2.7: Established an operational “one-stop shop” (OSS) for wind energy</b>			
Assist in the development of consolidated permitting requirements and training of personnel to support permitting procedures for wind projects in Sudan			Will be established after finalization of FiT and IPP Act.

Established an operational "one-stop shop" (OSS) for wind energy investors and developers			There is a national One-stop shop for all investment projects including wind energy. The project will facilitate the wind projects integration.
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- 1) The project prepared the ToR, selected and contracted a national consultant to conduct a survey of the existing legislation and regulation for private sector involvement in grid-connected Renewable Energies. The consultant submitted a draft report of the Independent Power Producers (IPP) study and that report was validated through a consultation workshop that was attended by different stakeholders. The consultant responded to the different comments that were reported by the participants of the consultation workshop and produced the final report.
- 2) The project prepared the ToR and selected an international consultant for the survey of policies and codes within the East African Power Pool members (EAPP). The international consultant would also support the Integration of policies and codes compatible with EAPP members. This contract was signed.
- 3) The project prepared the ToR and contracted national consultant to formulate the following:
  - a. The long-term energy policy and regulations for Sudan
  - b. A NAMA Feed in tariffs
  - c. A training programme
- 4) The project prepared the ToR(s) and selected a national and international consultant to develop and endorse a standardized Power Purchase Agreement (PPA) for grid-connected renewable energy projects. The consultants prepared and submitted their final report on the most applicable PPA.
- 5) The project had prepared the ToR for an international consultant to assist in the development of FiT systems for SUDAN. This contract is still pending approval from UNDP.
- 6) The project has prepared the ToR for a consultant to assist in the development and implementation of IPP Act for investors in Wind Energy projects. This Contract is still pending approval from UNDP.
- 7) The project had prepared a ToR for an international consultant to assist in the formulation and adoption of grid code for the interconnection of variable renewable energy sources. This contract was signed.
- 8) The project conducted a training program in Power Purchase Agreement (PPA) for (4) persons in South Africa and later a workshop on the same topic was arranged in Khartoum for 19 persons.

Table 4: Project performance under Outcome 3

Activity	Done	Not done	In progress
<b>Outcome 3: The Wind Technology support and delivery system strengthened</b>			
<b>Sub-outcome 3.1: Developed and approved wind atlas for Sudan in a GIS system</b>			
Compile existing wind data and develop wind Atlas for Sudan	- Data of 15 wind masts existing across the country was collected,		- Started the recruitment of International Firm to develop Sudan

	archived and uploaded to the server		wind atlas is under processing
Compilation of data on geology, land ownership and grid connection and bird migration	- GIS hosting Agreement with SETCO		
Integration of wind and other data set into a Web-based GIS system	wind Atlas version 1.0 was produced		
Assist in the standardization of wind meteo-stations and relocation of wind measurement masts	- Standardization report was published  - Wind measurement equipment's of 11 wind masts were calibrated in Germany		
Development of a national map to highlight priority areas for wind development			Started the recruitment of International Firm to highlight priority areas for wind development
<b>Sub-outcome 3.2: Local experts, technicians and practitioners capacitated to prepare</b>			
local experts and practitioners have training (training of 100 engineers (50 males + 50 females))	a total of 65 persons was trained in different wind technology disciplines.		
Certification of technical staff on WAsP and Compilation of data for the development of Wind Atlas into a GIS system	training workshop on WAsP was conducted.		
Establishment of a structured training program for national experts' technicians, academics and students throughout the construction of the Dongola wind farm		base line project not implemented	
<b>Sub-outcome 3.3: Approved RE-related curricula of specialized universities and the NERC.</b>			
Development of training and study material for universities and the national research center	3 Meteo-weather stations was purchased, erected and in Sudanese		

	universities and institutions.		
Establishing collaboration with established RE-related curricula and activities at international universities and institutions			Contract with UKCC to review the current renewable energy curriculum and programs in Sudanese universities and higher education institutions was made.

- 1) The project signed an agreement with SETCO (Sudanese Electricity Transmission Company) to develop and produce a wind atlas for Sudan in a GIS system, with additional layers for geology, geomorphology, land ownership and type (e.g. protected areas / forests), settlements and routes of migratory birds. The project staff carried out the standardization of wind meteo-stations and relocation of wind measurement masts. A standardization report for the wind measurement equipment was produced and all the wind measurement equipment were maintained and re-calibrated in Germany especially for the wind vane and wind anemometer. The project was able to draft a ToR to recruit an international firm for the development of a national map to highlight priority areas for wind development. The recruitment process is still pending approval from UNDP.
- 2) The project purchased and distributed automatic meteo-weather stations for a number of higher education institutions as a training and study material for university students and the national research centers. In this regard about 3 Universities students were trained in this respect.
- 3) To establish collaboration with established RE-related curricula and activities at international universities and institutions, the project signed a contract with University of Khartoum Consulting Corporation (UKCC) to review the current renewable energy curriculum and programmes in the Sudanese universities and higher education institutions. The consultant submitted the inception report and the final report.
- 4) Regarding wind resource assessment, a workshop on WAsP Software training program was conducted by the project in Khartoum for 11 persons.
- 5) A training course on Ammonit wind measurement equipment was attended by a project engineer in Germany, during the erection and operation phase of the procured weather stations a number of (3) persons were trained in Khartoum (NERC, U of K)
- 6) Regarding the wind Atlas updating, the project provided a training for 3 Engineers from SETCO GIS department on "Designing maps with ArcGIS" in Lebanon.

Table 5: Project performance under Outcome 4

Activity	Done	Not done	In progress
<b>Outcome 4: Adaptive learning and replication plan supported</b>			
<b>Sub-outcome 4.1: Documented lessons-learned, experiences and</b>			
Establishment of a quality management certification process (e.g. ISO 9001) at Dongola wind farm		base line project not implemented	
Documentation and dissemination of lessons learned			website, film and photos

Sub-outcome 4.2: Completed regional workshops for transferring knowledge			
Establish Study tours and networking connections at the regional level.	two out of planned regional tours was done: - Morocco tour. - Jourdan regional workshop		
Establish regional cooperation among the East African Power Pool on the development and integration of Renewable Energies in the East African Grid.			- Attempts to contact with EAPP was not succeeded.  - WillContact To EAPP through Ministry of International Cooperation.
Documentation and dissemination of lessons learned.	- Project website was established, all documents was securely uploaded and archived. - a series of documentary films was produced		

- 1) Since the baseline project was not implemented, a quality management certification process (e.g. ISO 9001) at Dongola wind farm was not established.
- 2) The project staff collected, compiled, and disseminated documented lessons-learned, experiences and best practices related to the development of the Dongola wind farm (including website, film and photos) for the wind farm project in Sudan.
- 3) The project had completed regional workshops for capacity building and knowledge sharing for the technical staff of different project's stakeholders at relevant regional countries (e.g. Morocco).
- 4) The project was not able to establish a regional cooperation among the East African Power Pool on the development and integration of Renewable Energies in the East African Grid. The project management tried many times to link with the EAPP, with no success.
- 5) The project developed a website ([www.wepd.org](http://www.wepd.org)) for the project activities that is user friendly and hosted @ AWSAM Hosting ([www.awsamhosting.com](http://www.awsamhosting.com)) Denver, Colorado, USA.
- 6) A Policy maker tour to the kingdom of Morocco to adopt the lesson learned from Morocco's Experience in the Field of Renewable Energy. The tour was arranged for (6) persons – 4 males and 2 females –



comprising of a (5) members of the National Assembly Committee of Energy, Water, Mining and Industry and the project manager.

Based on an analysis of the facts detailed above, the project has made significant progress towards achieving its outcomes. Capacity development includes the process whereby individuals, groups, and organisations enhance their abilities to mobilise and use resources in order to achieve their objectives on a sustainable basis (DFID, 2013). There is, in addition to the three levels in the definition, the 'institutional' context in which capacity development takes place. This covers the incentives, the economic, political and regulatory context and the resource base on which the context is built. Based on this DFID definition, PUSPG-WEP has made significant progress towards its outcomes.

#### 4.4. Project ownership, stakeholders' participation and partnerships

From a development context perspective, PUSPG-WEP goals, objectives and expected results were developed in line with Sudan's Medium-Term Power System Development Plan also targets the addition of 551 MW of renewable electricity to the national mix over the medium-to-long term Development Plan. In addition to this, the project also focused on supporting the development of private sector participation in renewable energy through the Independent Power Producers (IPPs) model. A deliberate focus of the project is redressing energy access inequality and energy poverty alleviation through the natural resources management potential that can largely be proffered as a sustainable vehicle towards poverty alleviation and climate proofing poor and vulnerable households in Sudan.

PUSPG-WEP was also formulated by Sudan nationals who understood the realities on the ground especially from the institutional strength and weakness perspective as well as from the perspective of the development needs of the country. This is clearly evidenced by the deep community grassroots engagements, analysis of the policy, socio-economic and institutional context of the project that is included in the Project Documents. Although the need for external assistance is highlighted in the PD, the project design proposed and implemented decentralised management of most of the critical elements of the project be placed in the hands of local, communal and national institutions as a way of further ensuring sustainability, ownership and commitment to build local skills, expertise and capability.

The assessment of the project formulation process and current project design for PUSPG-WEP revealed that the project emanated from a very comprehensive and robust analysis of the contextual status in Sudan. This was promised by the Government of Sudan by making considerable steps towards opening up major public service sectors to private investment, including the power sector, to help serve its population of 37 million.<sup>17</sup> It has already put in place incentives to encourage the participation of Independent Power Producers (IPPs) in the power sector. Sudan's Investment Encouragement Act, first passed in 1999 and later updated in 2003, 2007 and 2013 identifies the power sector as a major target for investment. It specifies power projects, and especially renewable energy power projects, as having strategic importance. As such, they are eligible for incentives such as exemption from import duties and customs. Their profits are also exempt from corporate income taxes for a decade.<sup>18</sup> Sudan's power sector remains Government-owned but has been restructured to reflect a private-sector structure. Independent companies have been established with responsibilities for power generation, transmission and distribution, including a single

<sup>17</sup> Central Bureau of Statistics, Sudan (2014)

<sup>18</sup> RCREEE (2013), *Arab Future Energy Index*.

company that owns and operates the Merowe Dam. This structure serves to further establish the framework for private sector participation.

The feedback from all stakeholders interviewed on the involvement of, and awareness in the project was supportive. All persons interviewed stressed the benefit of raising public awareness. Stakeholders praised initiation of discussion on promoting renewable energy as an energy source to diversify the energy mix at different levels.

Stakeholder consultation has been a key feature in the design of this project, and stakeholders have been involved in identifying and prioritizing the proposed intervention activities. The stakeholder consultation during the project implementation is supporting all the outcomes. Details of the stakeholder engagement during the PPG Phase were provided and a Stakeholder Consultation Plan was developed that outlined some of the key consultation principles and processes at a strategic level. It has been translated into practical action during the project implementation and provided guidance based on the initial stakeholder analysis, conducted as part of the project preparation process, and the consultations so far. This can be used to define further exact activities in consultation with the Project Board and Project Management Unit during the further period of implementation.

The project interventions involve national agencies. To ensure the proposed project was grounded in local realities whilst aligned to national policy, the PPG phase involved considerable stakeholder engagement and was driven through a PPG Steering Committee established as an inter-agency and multi-stakeholder coordination mechanism. The Stakeholder engagement on this project has been relatively satisfactory and it is evident by the manner of participation and commitment that all the relevant stakeholders are putting towards implementing the project.

#### **4.5. Effectiveness, efficiency and timeliness of project implementation**

On the basis of the quarterly reports, discussion with project staff and with stakeholders, the project is proceeding close to the original plan apart from the baseline wind farm which is heavily delayed. The project implementation was delayed initially because of the recruitment of the project's management unit staff being put in place. This preparatory PMU staffing recruitment work took little time, which saw the implementation of the project with a fully-fledged PMU starting in April 2015. With a fully-fledged PMU, the project implementation model is in line with other government programs, it is effective and delivered efficiently because all the programs are aimed at investment in green energy and access by needy communities to sustainable energy improved.

#### **4.6 Remaining barriers to achieving the project objective**

From the document analysis and project beneficiaries' field assessment visits, a number of barriers that were initially identified that need to be overcome in order to achieve the long-term solutions don't exist anymore. The implementation of an initial wind farm in Dongola is the remaining critical milestones in this project implementation. A strategic decision around existing budget has to be made soon as support to the implementation of the first wind farm in Sudan, Dongola, will align the wind farm with international best practices. It will also create a case study for replication in later wind farms which Sudan so desperately needs if it's to market itself as a renewable energy market ready economy as it solicits local and external investment in this sector. Failing to address the baseline wind farm that did not materialised to this point wont agar well for the renewable energy sector in Sudan. The opportunity to productively use the opportunities already provided to have such continuous exposure that's very rare which will assist in

transferring knowledge and experience to neighbouring countries will be lost. Also, the achievement of the project's aim to help diversify Sudan's power sources and reduce its reliance on fossil fuels, particularly for future expansion and to reduce greenhouse gas (GHG) emissions without a tangible wind farm on the ground in Dongola would always be debatable. So as the project's help increase Sudan's energy security and support its development will also be debatable. The project has been designed to play a catalytic role in this transformational scaling-up of wind energy, and renewable energies more broadly and without a tangible wind farm on the ground in Dongola, this too would be debatable.

#### 4.6.1 Funding for the base line project

The project had made several attempts to avail sustainable financing for the baseline project, with little success. This was basically due to the stiff US economic sanctions against Sudan for the last 19 years. Also, the cessation of South Sudan had further aggravated the problem by the fact that Sudan had lost almost 80% of its oil revenue to the South. The Government of Sudan is committed to support this project, but due to its meagre financial resources, was not able to allocate enough financial resources for this project. Many attempts were tried with potential regional or international financial support institutions, but with no success so far. The project exerted a lot of effort to realise the necessary funding for the base line project. There have been ongoing efforts made to finance the baseline project which can be summarised as:

##### a) Effort of Finance the Baseline Project: -

A committee was established to manage government fund available from the Ministry of Finance and National Economy (17.2 million SDG for 2016). The project supported & hosted meetings of the committee. MWRE signed a contract with Shirian AL-Shamal Company for Roads & Dams (L.T.D) on 17.11.2016 for construction of the access road to the Dongola wind project site (4.7 km). The access road cost is 5 million SDG. 80% of the construction of the access road has been completed. A joint mission from MWRE/UNDP/ visited the pilot project site at Dongola in January 2017.

##### b) MWRE Effort for finance the Project: -

A lot of efforts have been exerted and many trials have been made to finance the baseline project (fully or partially). These are:

- i. MWRE has applied for partial funding of the first phase of Dongola wind project (10MW) through IRENA/ADFD project funding facility in his 4<sup>th</sup> cycle. The application was not successful and the MWRE is now seeking other sources to finance the baseline project.
- ii. MWRE applied for funding Dongola wind project through Islamic Bank for Development for 2018 fund.
- iii. MWRE applied for funding Dongola wind project through Abu Dhabi Fund for Development.
- iv. MWRE has signed an MOU on August 2016 with the Chinese Company (Sinohydro) to implement Dongola wind project on EPC + finance basis. MWRE received the offer on Feb.2017 and under study and evaluation of the offer.
- v. MWRE has signed an MOU on Mar. 2016 with Florence Services & Ventures/Amda Energía Company to implement Dongola wind project on IPP basis. MWRE received the offer on Mar.2017 and under evaluation and negotiation.
- vi. MWRE established a committee to follow up and accelerate the finance of Dongola wind project on Mar.2017. The GEF project management unit PMU is part of the committee and the project is hosting the meetings of the committee.

- vii. In September 2017, a decision was made by the ministry to implement the pilot phase of the Dongola wind project from the ministry's own resources. Arrangements with the Ministry of Finance and National Economy are ongoing.

#### 4.6.2 Budget revision and budget line item allocations

With respect to budget line item allocations, the project's outcome 1 budget which amounts to US\$ 2,391,864 is significantly high (more than 63%) compared to the total grant amount. Looking carefully into the breakdown of outcome 1 budget reveals that there is a need for budget reallocation to meet other important project expenditures for the whole project life. In outcome's 1 budget the two main items are a) consultancy work (US\$ 1,331,000) and b) Equipment (US\$ 800,000). It is clear that this component is heavily loaded with the proposed consultancy work.

This same challenge faces the budget allocation of outcome 3. A significant portion of the budget of outcome 3 was allocated for consultancy services (US\$ 270,000) which amounts to more than 54 % of the proposed budget for this outcome. Again, this is an indication that the initial project budget's distribution amongst project outcomes was not realistic and this is the right time for budget relocation to avail more funding for urgent activities that support the achievement of the project's development objectives in the long run.

#### 4.6.3 Low Institutional Adaptive Management Capacity

The institutional capacity across the feedback loop from monitoring and evaluation technical aspects requires strengthening. MS Project is being used as a project management tool which is good. However, risks from barriers like the delivery of the baseline project which hasn't been delivered on haven't been escalated on taken seriously on how they can be mitigated. For a demonstration project, it's of paramount importance to practically demonstrate what's being referred to even if it's at a small scale – people want to see, feel and touch what the hype around the demonstration is. Failure of which discredits the project idea even though it's a brilliant one. Other stakeholders are looking at it and questioning if reprioritisation on available funds can't be agreed upon to make a demonstration happen, then why believe in this in the first place? The capacity of having this discussion and a resolution taken on it at PB, PTC levels has seemed to be missing and requires urgent attention. Without targeted adaptive management efforts to decide on this issue, this will create a barrier to long-term renewable energy uptake once a negative perception starts making the rounds in the sector. This was also reflected upon in most of the interview engagements, which also corroborates this finding, evidencing a lack of capacity for adaptive management, planning and implementation were cited as capacity barriers.

Whilst different stakeholders have greater capacity in certain elements than others - and the project has built on these strengths where possible – a further continuous process of capacity building across the project cycle is still needed. Some specific technical trainings will be needed (e.g. on contracting, interconnection agreements, feed in tariff negotiations, wind energy on the job training sites) whilst for the main implementation aspects it would be best to continue to take a learning by doing approach with ongoing mentoring support as required, that builds problem solving confidence and the ability to work out solutions in a systematic, decisive and consultative way on which risks to tolerate and which one not to e.g. the current baseline project failures are a risk not worth tolerating and it could easily create a very bad name for the entire project.

Similarly, institutional barriers have contributed in most countries to weak coordination between those working on climate change mitigation, development and poverty reduction. Government departments responsible for poverty reduction and energy access are in some cases aware of renewable energy options, but have no means of coordination, which leads to the development of parallel efforts. In this case all the key areas within the Sudanese government alongside non-government partners/stakeholders are being well coordinated through multi-sectoral representatives in the PTC, PMU and PB structures.

#### 4.6.4 Low levels of Private Sector Investment Advisory

Access to energy, especially reliable, affordable, clean and smart electricity is important in addressing energy poverty and improving energy access in Sudan. The extent to which investors' and people receive the advice on renewables will also affect the extent to which new techniques and practices are understood and made available for adoption. From the evidence generated during the MTR phase there were no independent power producers (IPPs) in the Sudan, though initiatives are underway to promote private investment in power generation. Certainly, the Government of Sudan has made considerable steps towards opening up major public service sectors to private investment, including the power sector, to help serve its population of 37 million.<sup>19</sup> It has already put in place incentives to encourage the participation of Independent Power Producers (IPPs) in the power sector which has important implications for energy access as the cost for a single centralised grid system are staggering and vulnerable to high cost shocks is considerable which can be a dis-incentive for private investment. This project seeks to support those initiatives where they relate to wind power by highlighting renewable energy power projects, as having strategic importance.<sup>20</sup> This structure serves to further establish the framework for private sector participation to keep sending out the IPPs and PPAs messaging though focused mainly on wind energy as a means of private sector investment advice – the other renewable energy sub-sectors other than wind can always easily adapt this to suit their needs and requirements'. This has been very evident and important with respect to the project's approach to apply and promote interventions that offer value addition: differential approaches have been used by project interventions in aiding renewable energy stimulation mainly wind energy and supporting both men and women through most of the projects aspects that have been programmed to date. The project needs to continue with this intentional targeting of both male and female beneficiaries in all aspects of its outcome areas if gender inequality is to be abated.

#### 4.7 Project Administration and Management Arrangements

PUSPG-WEP is a Nationally Executed project that is scheduled for implementation over a period of five years beginning in January 2015 implemented through the Ministry of Water Resources and Electricity (MWRE) which has succeeded the Ministry of Electricity and Dams (MED) as the body responsible for the electricity sector in Sudan, which is the designated institution for the implementation of the project. It has overall management oversight and monitoring responsibility over the project. UNDP Sudan Country Office has the facilitating role for project implementation, which includes assisting in the procurement of equipment, international and local consultants for the project as needed and requested by the implementing agencies.

A Project Management Unit (PMU) was established and is operational. The PMU is composed of 1) A Project Manager, 2) Technical Assistants, 3) A financial officer, and 4) logistics officer. The project established an operational Project Board and a Technical Committee representing different stakeholders in Sudan. These management instruments were very instrumental in guiding the process of project development to achieve its developmental objectives. Project implementation is guided through high-level policy guidance and orientation from a Project Board (PB) alongside a Project's Technical Committee (PTC).

<sup>19</sup> Central Bureau of Statistics, Sudan (2014)

<sup>20</sup> RCREEE (2013), *Arab Future Energy Index*.

A Project Implementation Unit (PIU) which is headed by a Project Manager (PM) is attached to MWRE where it has specific responsibility for project implementation. The PTC works under the supervision of MWRE. The PM U is also supervised by MWRE, who are the executing agency of the project. The PMU is also responsible to UNDP, through the executing agency, for the application of all UNDP administrative and financial regulations and procedures for the use of UNDP/GEF funds.

**Table 6:** Performance of the Project Board

Nº	Meeting date	Attendance %	Decision taken	Done	Not done	In progress
1	18 Feb. 2015	93%	1. The Project Board Meeting to be held at least twice a year.	X		
			2-The "Project Technical committee" to be changed to "Project Technical and legal committee".		X	
			-Finalise the project management team during two weeks from this meeting	X		
			-The budget and the detailed plan to be approved in the next meeting after being prepared by the project manager	X		
			-The Project Board decisions to be circulated to the members by the secretary of the Project Board.	X		
2	17 May 2015	72%	The budget has been approved as temporary budget until the revision of next board meeting in August 2015.	X		
			The project management should consider and build on the activities that have been done by the different government entities.			X
			The next Project Board meeting to be held before August.		X	
			The detailed plan and budget should be prepared and presented to the technical committee quarterly.	X		
			The MWRE and representatives of the MOF should seek finance for the first phase of the baseline project.			X
3	17 Dec. 2015	64%	Accelerate the steps towards constructing the baseline Wind farm in Dongola because it will help in finalizing the activities of outcome one.			X
			The project management should cooperate with and build on the activities that have been done by ERA to facilitate and encourage the private sector investment.	X		
			The MWRE and representatives of the MOF and the Ministry of International cooperating should seek finance for the first phase of the baseline project.			X
4	17 Jan. 2017	79%	Accelerate the implementation of all the elements of the project while considering the dependency of the activity especially for the baseline project.			X

			Consider alternative plans for the project implementation such as offer the baseline project implementation for the IPPs.	X		
			The project team should well prepare all the documentations translated in English language for the next mid-term review in the next July.	X		
			Initiate a committee to follow up and accelerate the baseline project finance	X		
			To follow up the advance payment for the access road for Dongla Wind Farm project as the Ministry of Finance committed to deliver the payment	X		
			The Project Board approved the annual report for the year 2016 and the plan and budget for the year 2017.	X		
			The Board Agreed to establish a NIM Support Unit within the UNDP to equally support the NIM projects implemented by different partners and the cost of it is to be shared proportionally between NIM projects.	X		
			The board also agreed to set limit of approving authority of the project manager. The board delegated the chairperson, Mr. Musa Omer, to take the action and inform the project manager on his decision.		X	

**Table 7:** The performance of the Technical Committee.

Nº	Meeting date	Attendance %	Decisions taken	Done	Not done	In progress
1	8 July 2015	92%	MWRE should finance the base line project internally like other power generation projects.			✓
			MWRE have to contact other bidder to negotiate a down scaled offer. A new design will be required for the down scaled project which represents an opportunity for the project. Also, the local component at the Ministry of Finance and Economy (SDG15 millions) could be utilized for this purpose.		✓	
			The RE law 2001 is not accommodating many new developments in the sector and the approval of the new RE law is vital for the development of RE in Sudan.		✓	
			There exist a Draft PPA developed by the East African Power Pool (EAPP) which could be useful for the project initiative in developing a PPA for Sudan.	✓		
			Establishing proper and functional policies and Regulations are critically vital for private sector development in the renewable energy and the project should seek maximum achievement on this output, which is successful, then it will enable private investment in the sector. Otherwise it is not anticipated that, private sector will enter into the power sector as a whole.			✓

			Currently available wind data deemed sufficient to kick-off the development of wind Atlas and analysis should proceed on this activity.	✓		
			The project is recommended to invest in new wind measurement stations as deemed necessary to cover any gaps.		✓	
			The project will assist in the development of standards for testing for wind measuring station for Sudan. This will be based on existing hardware, through calibration and covering any gaps.	✓		
			The lack of representation of the private sector in the technical committee was highlighted and in absence of active players in the wind energy across the country while having quite strong PV players, the technical committee recommended to invite key PV players to become members of the Project Technical Committee. This is deemed acceptable as the policy and regulatory issues are not only targeting wind energy player but rather renewable energy development in the country and it will be of high importance to hear the voice of those having experience in renewable energy business at large.	✓		
			The technical committee recommended to focus on experts from the region and countries of similar experience when deploying international consultants in the project as this will be more useful to the country than focusing purely on technical qualifications	✓		
2	5 Nov.2015	85%	The MWRE requested the consultant to prepare a design for downscaled size of the project, expecting to receive the new design by next week. Then the ministry will seek to secure funding from its own resources as well as the local component funds available from the ministry of finance which is due to be missed if not utilized within the remaining time of the year. The Renewable Energy Directorate is recommended to urgently contact the National Development Directorate at the Ministry of Finance and National Economy and arrange for urgent disbursement of the budget and seek for additional contribution in next year's budget		✓	
			Alternatively, the project initiated GCF concept note is recommended to be taken forward by UNDP for submission to the GCF.		✓	
			The consultant working on the grid code and the FiT model is expected to finalize the work by mid-2016 and the project will review and assist the ERA in filling the gaps.			✓



			Upon presentation on the outcomes of the workshop on PPA in South Africa (participation was financed and facilitated by the project) the Minister of Water Resources and Electricity assigned a task force chaired by the ERA to follow the development of the PPA model. The project is finalizing the recruitment of the International Consultant for this activity which is implemented in collaboration with the ERA. The activity was delayed due to slowness in UNDP business process in recruiting the consultant	✓		
			The new RE Law expected to be presented by the MWRE to the council of ministers soon, however, the technical committee noted that, strong efforts at all level are required to get such a law through the different approval entities			✓
			The recruitment of the international consultant for the WASP training was delayed due the slow business process by UNDP. Contractual arrangements are in progress and, once over, the project is ready to go forward with this training as the software licenses were already purchased. Further, participating agencies were already identified and invited to nominate their candidates	✓		
			One private sector company joined the committee meeting and deemed representative for the private sector in line with the recommendation of the previous technical committee meeting.  Further, the meeting recommended to invite the Ministry of Finance and National Economy to join the technical committee as a member	✓		
			It was noted that, recruitment of international consultants is taking long resulting in shuffling of activities from the previous quarter and the project is currently following a parallel route to do desk review for potential consultants and requested the committee members to assist with names and addresses of consulates to undertake grid integration study for renewable energy power generation	✓		
			The project is recommended to provide indication of the advances against disbursement figures as part of the quarterly operation report to the technical committee	✓		
			UNDP has exercised a budget revision which is partially approved, intended changes should be communicated before 20th November 2015	✓		
			The National Consultant recruited to undertake study on the effect of wind farms in Dongola and Red Sea on migratory soaring birds has presented his finding to the technical	✓		

			committee. The committee members provided several comments which will be addressed by the consultant in the study final version.			
3	1 FEB 2016	85%	QOR and AWP was approved			
4	12 May 2016	86%	The committee recommended including the Energy Research Centre as a member in the procurement committee for the baseline project.		✓	
			It is recommended to go for small size in the pilot phase for the process of learning and avoid deployment of big machines at this stage			✓
			The application for funding from IREN for wind power plant has passed the first stage and currently in the stage of preparation of the full project proposal	✓		
			It was noted that, Khartoum could have been a better site for the base line (first) project, however, it was clarified that, land acquisition was not possible due to obstruction to RADAR communication systems	✓		
			The Regulatory authority has received the final document of the Grid Code and the Tariff model. This will undergo a review process and the will assist in further development if required.	✓		
			- A coordination with the Sudanese Standards and Metrology(SSMO) is recommended to maintain the required IEC document by the project in the Wind/Solar Technologies to the country			✓
			- It was noted by the private sector and the research/universities that no private consideration for wind in the absence of a Wind Atlas giving information on the potential on a scientific basis. As such the development of the Sudan Wind Atlas by the project was noted as crucial activities for the development of the technology in the country.			✓
			The PIR (mandatory by UNDP-GEF) was considered as sufficient for informing the technical committee on the project progress against its milestones.	✓		
			It was recommended to direct support planned for Sudan participation in the Eastern Power Pool (EAPP) to Sudan-Ethiopia bilateral interconnection efforts		✓	
5	18Aug.2016	86%	The committee recommended to contact Wind Guard company which is preparing study for Alshiek Ibrahim Harbor wind- Energy hybrid project at Port Sudan for future study for the baseline project.	✓		

			The committee recommended to contact university of Khartoum consultancy corporation (UKCC) as it has partner agreement with multi International consultants to recruit International Consultants (IC) for study on Grid Integration Cost	✓		
			The application for funding from IREN for Dongola wind power plant has submitted full project proposal and was short listed currently in the stage of recommendation by the advisory committee.	✓		
			The committee recommended to have a site visit to Dongola project.		✓	
			The committee recommended contacting university of Khartoum consultancy corporation (UKCC) as it has partner agreement with multi International consultants to recruit International Consultants (IC) for studies on Grid Integration Cost, revision and finalization of Sudan grid code and the Tariff model.		✓	
			The committee confirm Morocco for a policy maker study tour	✓		
			The Committee recommended to contact the same consultant (Riso National Laboratory for Sustainable Energy–Demark) who conducted the wind Atlas for Egypt, Morocco and South Africa to develop Wind Atlas for Sudan in a GIS system.	✓		
			The Committee recommended supporting the new project Manager.	✓		
6	20 Nov. 2016	86%	The committee recommended contacting Lahmeyer International, ECREE, COMESA and ESCOA for recruitment of an individual consultant (IC) to develop the bidding document for the baseline project.		✓	
			The committee recommended to wait until the results of the IRENA and the Abu Dhabi Fund for Development (ADFD) are out, then proceed in signing contract with IC to develop the bidding document for the baseline project because in case the project has been selected for the fund the bidding document should follow IRENA procedures.		✓	
			The committee recommended to add activities progress chart to the QOR to facilitate the project follow up by the PTC	✓		
			The committee recommended contracting national consultant for the development of framework for the Independent Power Producers (IPP) to start the work with the	✓		

			committee which established to develop the framework for Independent Power Producers			
			Committee recommended to involve the Energy & Research Centre in evaluating the wind data and installing of the wind measurement station.			✓
			Committee recommended to be involved in the review of the technical documents before the final approval	✓		
7	23 Feb.2017	86%	The committee recommended to delegate the preparation of the alternative scenarios for the project mid-term review in case the baseline project failed to start due to funding problems to the special committee initiated by the project board to search for funding to the baseline project.			✓
			The committee recommended preparing progress chart to facilitate the project follow up illustrating the whole project life plan and the annual plan against the actual progress. The committee recommended tight follow up to accelerate the process of the international consultant recruitment through the UNDP.	✓		
8	30 April 2017	79%	Recommended to prepare all the documents which shows the effort that has been taken by the MWRE to secure the finance of the baseline wind project before project mid-term review	✓		
			The committee recommended to accelerate the achievements in the second outcome before the project mid-term review.			✓
			The committee recommended to follow up with the educational institutions that received the demonstration weather station in order to insure the maximum benefit.	✓		
			To maximized the benefit of the weather stations data the committee agreed to handover the third demonstration weather station to Omdurman AL ahlia university to cover Omdurman area in addition to that they have the RE research centre.	✓		
9	27 Aug. 2017	71%	The committee recommended that MWRI will continue on the efforts to implement the Dongola Wind farm (dismantle units) and should include the project in the 2018 budget.			✓
			The committee recommended to arrange a meeting between the MWRE-RE Directorate,			✓

			WEP and UNDP staff to discuss the delay from UNDP side to recruit the (IC) for Grid Code, IPP, FiT and Sudan Wind Atlas before the Project Board meeting.			
			The committee recommended to distribute soft copies of the PPA to members of committee	✓		
			The committee recommended MTR Auditor to visit NERC' & U of K. Energy Research Centre' weather station			✓
			The committee recommended that ERA to get the available RE standards from Sudanese Standards and Metrology Organization (SSMO).			✓

**Table 8:** The performance of the project management unit (field visits)

Nº	Mission Description	Place	Duration	Team members
1	Site investigation for effect of wind turbines on Migratory Soaring Birds in the Red Sea project area (Mohammed Goal, Eait, Suakin and Tokar)	Red Sea state, Port Sudan based	6 days 1 Oct 2015	MSB consultant, WEP
2	Site investigation for effect of wind turbines on Migratory soaring Birds in Dongola	Northern Sudan, Dongola based	4 days 22 Oct 2015	MSB consultant, WEP
3	Support MWRE/RE in the reception of Dongola wind meteo mast from the contractor	Dongola	3 days 19 Jan 2016	3(WEP, MWRE)
4	Assist MWRE/RE department to maintain the wind meteo mast @ Nyala site	Nyala	4 days 27 Feb 2016	2(WEP, MWRE)
5	Dongola wind farm site visit with UNDP country office team	Dongola	2 days 7/3 and 9/3/2016	9 (MWRE, ERA, UNDP-Sudan, Indian Embassy)
6	Assist MWRE/RE department to maintain the wind meteo mast @ Toker site	Toker	4 days 9-12 March 2016	2(WEP, MWRE)
7	Civil-work committee: Access Road constructions follow up.	Dongola	4 days 1-4 April 2017	2(WEP, STPG)
8	Determination of Access Road path from Dongola highway to wind farm site	Dongola	3 days 30 May – 1 June 2016	2 (WEP, SETCO) + Urban planning Engineer(s) Northern state
9	Site visit to Ministry of Oil and Gas to storage area to acquire and transfer the property of number of (11) wind meteo masts to MWRE.	Al-Kadaro, Khartoum North	(2 times) 6 April 2016 16 June 2016	Ministry of Oil, MWRE, WEP
10	Civil-work committee: delegation of Access Road construction work to Shirian Al-Shamal Company	Dongola	4 days 29 Nov 2016	2 (WEP, STPG)
11	Civil-work committee: Access Road constructions follow up.	Dongola	2 days 20 Sept 2017	WEP

**Table 9:** The performance of the project management unit (meetings with partners)

Nº	Description	Date/Place	Parties
1	Presentation about the IPP implementation in power generation: case studies, Thailand.	9 Nov 2015 WEP office, Khartoum	SETCO, MWRE

2	IPP committee: first meeting: HOW-TO establish IPP in Sudan.	3 Feb 2016 WEP office, Khartoum	MWRE, ERA, WEP
3	Assist MWRE-RE directorate to acquire and transfer the property of a number of (11) wind meteo masts from the Ministry of Oil and Gas.	6 April 2016 Ministry of Oil Al-Kadaro store site, Khartoum North	Ministry of Oil, MWRE, WEP
4	Evaluation of the technical/financial offers of the bidders to supply a number of (3) weather station for Research purposes.	11 April 2016 WEP office, Khartoum	WEP
5	Civil-work committee: - first meeting - determination of the civil work that can be funded by the local component ... etc.	17 April 2016 WEP office, Khartoum	MWRE, STPG, WEP
6	Meeting with Government of the Northern state to discuss the wind farm Land Lease Issues and access road to farm site	1st June 2016	MWRE- undersecretary, Northern state Governor, Agriculture and Urban Planning ministers/northern state, WEP
7	Meeting with ERA to grant the licence of "Operate and Generate Electricity from wind farm" for Dongola wind farm	7 June 2016 ERA office, Khartoum	ERA, WEP
8	Civil-work committee: develop a road map guideline for the construction work of Dongola wind farm Access Road.	19 July 2016 WEP office, Khartoum	MWRE, STPG, WEP, SETCO
9	Meeting with National Energy Research centre, turnover a Copy of IEC standards regarding wind and solar.	25 July 2016 NERC HQ, Khartoum	WEP, NERC
10	Meeting with MWRE-solar pumping project, turnover a Copy of IEC standards regarding solar.	25 July 2016 MWRE RE directorate Khartoum	WEP, MWRE/solar pumping project
11	Meeting with MWRE, turnover a Copy of IEC standards regarding wind and solar.	25 July 2016 MWRE RE directorate Khartoum	WEP, MWRE/SEDC/Rural Electrification dept.
12	Meeting with MWRE, turnover a Copy of IEC standards regarding wind and solar.	25 July 2016 MWRE RE directorate Khartoum	WEP, MWRE
13	Meeting with the University of Khartoum Consultancy co to clarify the requirements of ESIA study for RED sea coast wind farms in Sudan	26 July 2016 WEP office, Khartoum	University of Khartoum Consultancy co, WEP
14	Meeting with Energy Research centre, University of Khartoum, turnover a Copy of IEC standards regarding wind and solar.	27 July 2016 UofK, Khartoum	WEP, R-Centre U of K
15	Evaluation of technical and financial offers for ESIA-RED sea coast study	2 Aug 2016 WEP office, Khartoum	
16	Civil-work committee: review the design and quantities submitted by Urban planning/Northern Sudan state Access Road construction.	21 Aug 2016 WEP office, Khartoum	MWRE, STPG, WEP
17	Civil-work committee: drafting of technical specifications for Dongola wind farm Access Road construction.	23 Aug 2016 WEP office, Khartoum	MWRE, STPG, WEP
18	Civil-work committee: approval of technical specifications and do Bidding work for Dongola wind farm Access Road construction.	5 Sept 2016 WEP office, Khartoum	Ministry of Finance, MWRE, SETCO, STPG, WEP
19	Publishing the "PPA for wind turbine and wind farms in Sudan". Distributing copies for relevant stakeholders.	21 Sept 2016 WEP office, Khartoum	MWRE, ERA, UNDP

20	Civil-work committee: finalizing the Bidding process and select the contractor for the Access Road construction.	16 Oct 2016 WEP office, Khartoum	Ministry of Finance, SETCO, MWRE, Concrete Co, WEP
21	Meeting with National Energy Research centre, turnover weather station Equipment to NERC.	10 Jan 2017 NERC HQ, Khartoum	WEP, NERC
22	Civil-work committee: Access Road construction contract issues.	16 Jan 2017 WEP office, Khartoum	Ministry of Finance, SETCO, MWRE, WEP
23	Meeting with SETCO General Manager to grant the hosting of Sudan wind atlas in SETCO's GIS system	24 Jan 2017 SETCO HQ, Khartoum	SETCO, WEP
24	Meeting with Energy Research centre, University of Khartoum, turnover weather station Equipment to the Univ.	2 Feb 2017 UofK, Khartoum	WEP, R-Centre UofK
25	Signing the Agreement for hosting Sudan wind Atlas in the SITCO's GIS system	29 March 2017 SETCO HQ, Khartoum	MWRE-RE directorate, SETCO, WEP
26	submitting a number of (12) Renewable Energy references to MWRE-RE general directorate	20 April 2017 MWRE-RE directorate	MWRE-RE, WEP
27	Financing Dongola wind farm pilot project, a committee work composed of 3 meetings. A report was handed to MWRE undersecretary on 15th of May 2017	(3 meetings) 22 March 2017 9 April 2017 11 May 2017	MWRE, ERA, Ministry of finance, Ministry of International cooperation, Ministry of Environment, Natural Resources,
28	Approval of the National Consultant report "Sudan IPP Act"	20 July 2017 WEP office, Khartoum	MWRE, SETCO, ERA, WEP
29	Meeting with Energy Research centre, Omdurman Ahlya University, turnover weather station Equipment to the Univ.	20 Aug 2017 Ahlya Univ. Omdurman	WEP, RE-Centre Ahlya university
30	Meeting with SETCO's GIS system Engineer to update the data compilation of wind atlas	17 Sept 2017 WEP office, Khartoum	WEP, SETCO
31	Submitting the measurement instrument for a number of (6) met. Masts after performing the calibration process to MWRE-RE general directorate	21 Sept 2017 MWRE-RE general directorate office, Khartoum	MWRE-RE, WEP

**Table 10:** Performance of the project management unit (Coordination meetings with stakeholders)

Nº	Description	Date/Place	Other Parties
1	Meeting with the National Consultant candidates for developing the MSB study	5 Sept 2015 WEP office, Khartoum	
2	Skype team conference and desk review of PPA document with the International Consultant	1 Feb 2016 WEP office, Khartoum	National Consultant, ERA
3	Review the status of the project website "www.wepd.org" and renew the service contract to perform necessary updates.	23 Feb 2017 WEP office, Khartoum	
4	Signing the contract with National Consultant to develop Sudan IPP Act	1st May 2017 WEP office, Khartoum	

**Table 11:** Training workshops

#	Workshop	Location	Period and duration	Participants
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1	Updating Grid Emission Factor	Kampala-Uganda	2 days 19-20 Aug 2015	3 persons (2 males, 1 female) (MWRE, WEP)
2	Power Purchase Agreement	South Africa	2 days 24-25 Aug 2015	4 persons (males) (ERA, MWRE, WEP, STPG)
3	Grid Integration of RE Power Generation Systems	Jordan-Amman	2 days 2-3 Sep 2015	2persons(males) (SETCO, WEP)
4	NAMA Academy Fall 2015	Copenhagen	6 days 4-9 Oct 2015	1 persons(male) (NPM/WEP)
5	WAsP Software training program	Khartoum	7 days 13-19 Dec 2015	11 persons (8 males and 3 females) (MWRE, Sudan Univ., Alneelin Univ., NERC, Khartoum Univ., Solarman CO, WEP)
6	Wind farms and contracts management	Dubai	5 days 27-31 Dec 2015	2persons (male and female) (MWRE, GPC/MWRE)
7	renewable Energy technology	Egypt	2 weeks 6-17 March 2016	1 person (male) (WEP)
8	Finance for Non -Financial Managers	Khartoum-Sudan	3 days 12-14 April 2016	4 persons (3 males and 1 female) (ERA, MWRE, WEP, SETCO)
9	Power Purchase PPA	Khartoum-Sudan	3 days 15-17 May 2016	19 persons (12 males and 7 females) (STPG, ERA, MWRE, National Assembly, MoF, SETCO, SEDC)
10	Financing Power Projects	Nairobi –Kenya	3 days 11-13 July 2016	5 persons (4 males and 1 female) (ERA, MWRE, SETCO, WEP)
11	wind turbine technology	India	3 weeks 17 Aug – 9 Sept 2016	1 person (male)
12	Policy maker tour to kingdom of Morocco	Morocco	5 days 17-21 October 2016	4 persons (2 males and 2 females) (National Assembly (GOS) and WEP)
13	Ammonit wind measurement equipment	Berlin, Germany	3 days Nov 2016	1 person (male) (WEP)
14	weather station erection and operation training	NERC HQ SOBA, Khartoum	1 day	3 persons (2 males and 1 female)



15	Formulating proposals for low carbon climate resilient development: Designing Green Climate Fund (GCF) Projects	Enschede-Netherlands	12 days 12-23 June 2017	1 person (male) (WEP)
16	Designing maps with ArcGIS	Beirut, Lebanon	11 days 25 Sept 2017	3 persons (males) (SETCO)

#### 4.8 Work planning

The logic of the projects work plan makes it relevant to the Sudan situation where the quest has been to support the removal of barriers to the adoption of utility-scale wind energy tied to the national grid in Sudan. Wind energy has been identified as a priority mitigation technology by the Government of Sudan, and, although it is a mature technology globally, it has not yet been adopted in Sudan. A systems approach has been adopted to integrate energy policy analysis within the broader developmental objectives of Sudan. This will result in strengthened capacity of Sudan to establish regulatory frameworks for encouraging private investments in grid-connected wind energy.

As shown in the results evaluation table, progress has been made towards the realisation of the project objectives and outcomes at the mid-term stage apart from the support to the implementation of the first wind farm in Sudan, Dongola that aligns the wind farm with international best practices which hasn't materialised yet. Analyses of the status of support to policy and regulatory development, particularly to encourage private sector participation; strengthening the support for wind technology in the country and support an adaptive learning and replication plan from the project has been conducted and the results of these are well advanced and now being used for further project implementation.

Support to the implementation of the first wind farm in Sudan, Dongola, that aligns the wind farm with international best practices has been flagged as risk at this mid-term point even from a work planning point of view. Its resolution has been flagged in the recommendations as it will also create a case study for replication in later wind farms which will be good for Sudan's wind energy sector and renewable energy sector much more broadly once the Dongola wind farm is implemented.

On the ground, following the policy and regulatory development, particularly to encourage private sector participation; strengthening the support for wind technology in the Sudan and supporting adaptive learning a very good platform and base has been laid to take the wind energy sector forward in Sudan. The combo of interventions which the work plan has provided and offered has been much appreciated by many while the 1<sup>st</sup> wind farm in Dongola has constantly been flagged as a work plan risk. Finally, the activities in the work plan are set up in a very practical and implementable way having assumed all the funding would be available or easily accessed to support the project mainly for outcome 1: as the baseline wind farms currently face technological barriers, which have not been taken into consideration in their risk matrix during the design phase of the project. The work plans deliverables are well organised and listed in an interrelated way which is progressive from one activity to the other. Overall, the work plan shows that the activities and targets set for this stage of the PUSPG-WE project have been mostly met apart from one major one, indicating successful implementation of the project thus far.

#### 4.9 Financial Management

The financial management of this project is controlled at local level. All necessary procedures appear to be in place. Technical administration of the components is undertaken by the expert responsible in collaboration with the appropriate Project Manager. The project disbursed \$ 1,102,586 which is equivalent to 29.12% of its approved grant fund of US\$ 3,786,364 with budget utilisation rate of 39.86% of the mid-term budget allocation which is \$ 2,766,140. The latest due Financial Statements were submitted by the project within the stipulated time. Also, due IFR of the 2017 second quarter were submitted on time and reviewed by UNDP.

**Table 12:** Financial Progress: April, 2015 – August, 2017 Project budget utilisation against the plan

	GEF Budget Amounts	GEF Received & Disbursement	GOS Received & Disbursement	GEF % Disbursement –Total	GEF Budget Amounts 3ys	GEF % Disbursement- mid term	TOTAL
Funds Received or Allocated: -							
Opening Balance							
Amounts Received	3,786,364	1,102,586		29.12%	2,766,140 (1,893,182)	39.86% (58%)	
Foreign Exchange Gain		1,524.50					
Total Cash Available	3,786,364	1,171,377					
Less payments by Component:							
Component 1	2,391,864	171,880.48		7.19%	1,815,000	9.47%	
Component 2	501,660	221,830.07		44.22%	379,800	58.41%	
Component 3	500,000	98,088.73		19.62%	328,000	29.91%	
Component 4	210,000	57,920.03		27.58%	127,000	45.61%	
Project management	182,840	100,083.78		54.74%	116,340	86.03%	
Loans or advances		83,055.84					
Foreign Exchange (Loss)		84,357.05					
VAT paid on invoices		486.82					
Total Payments	817,702	817,702.80					
Closing Cash & Bank Balance	353,675	353,675.14					

- a) The project's financial management system is well established, especially after the appointment of the finance assistant at the UNDP office to support the project's finance section in dealing with the budget coding as per the project's main outcomes. The addition of the finance office at the UNDP office had positively affected the performance of the project's management unit.
- b) The project's outcome 1 budget which amounts to US\$ 2,391,864 is significantly high (more than 63 %) compared to the total grant amount. Looking carefully into the breakdown of outcome 1 budget reveals that there is a need for budget reallocation to meet other important project expenditures for the whole project life. In outcome's 1 budget the two main items are a) consultancy work (US\$ 1,331,000) and b) Equipment (US\$ 800,000). It is clear that this component is heavily loaded with the proposed consultancy work. This could be revised as per the negotiation outcome with UNDP and the MWRE.

- c) The total disbursement for outcome 2 (58%) is even higher than what is projected for the project's midterm disbursement. This same analysis holds for outcome 4, where the total disbursement amounts to 45 % which is reasonable at the midterm expenditure.
- d) This same challenge faces the budget allocation of outcome 3. A significant portion of the budget of outcome 3 was allocated for consultancy services (US\$ 270,000) which amounts to more than 54 % of the proposed budget for this outcome. Again, this is an indication that the initial project budget's distribution amongst project outcomes during the design phase of the project was not realistic and this is the right time for budget relocation to avail more funding for urgent activities that support the achievement of the project's development objectives in the long run.
- e) Looking very carefully into the main budget lines of the project's management budget, which are equipment, communication, office supplies, and miscellaneous, we see that these items were already purchased and the rest of the budget (14%) should be enough to cover any incidental request for these items during the second half of the project's lifetime.
- f) A training course about "Financing Power Projects" was attended by five (5) persons in Kenya. Also, the project conducted a training course for four (4) persons in Khartoum about "Finance for Non-Financial Managers".

**Table 13: Procurement Budget Status (2015 – 2017)**

#	Activities	Budget	Completed	Outstanding	%
1	Goods	41,277.55	41,277.55		
2	Works				
3	Consultancy	117,609.97	117,609.97		
4	Training Plan	101,712.24	101,712.24		
	<b>Overall</b>	<b>260,599.76</b>	<b>260,599.76</b>		

**Table 14: Procurement Status (2015 – 2017)**

Budget Note	Description of cost item	Completed	Outstanding	In progress (%)
a.	International technical consultants to support grid integration, wind farm implementation, NAMA finance, and knowledge transfer			TOR for IC for NAMA finance
b.	Local consultants to support the international consultants on grid integration, wind farm implementation, NAMA finance and to begin building local capacity in these areas			Local consultant for NAMA finance, consultant for MSB, ESIA studies
c.	Long-term consultants and project staff	done		

d.	Land travel to the Dongola project site, accommodation at the project site, international travel to and from Khartoum and accommodation in Khartoum for international consultants.			as per field trips
e.	Equipment to support monitoring and integration of the wind farm into the Sudan power grid		base line not implemented	
f.	Institutional and policy experts with experience in renewable energy frameworks – specifically, feed-in tariffs and regulations, technical experts with experience in wind energy yield forecasting and development of grid codes for wind			Recruitment of international consultants for IPP, Grid code and FiT.
g.	Local consultants to support the international consultants on feed-in tariffs and regulations, wind energy yield forecasting and development of grid codes for wind			Local consultants for IPP and Grid code
h.	Long-term consultants and project staff	done		
i.	International travel for consultants to and from Khartoum, accommodation in Khartoum, minimal travel within Sudan.	PPA IC travel		
j.	Workshops and meetings, mainly with Government officials around the formulation of policies and creation of a "one-stop-shop" for wind investors		not done	
k.	Workshops and meetings, mainly with Government officials around the formulation of policies and creation of a "one-stop-shop" for wind investors		not done	
l.	Institutional and policy experts with experience in renewable energy frameworks – specifically, feed-in tariffs and regulations, technical experts with experience in wind energy yield forecasting and development of grid codes for wind			Recruitment of international consultants for IPP, Grid code and FiT.
m.	Local consultants to support the international consultants on feed-in tariffs and regulations, wind energy yield forecasting and development of grid codes for wind			Local consultants for IPP and Grid code
n.	Long-term consultants and project staff	done		
o.	International experts in wind mapping, wind site surveying and GIS systems to develop wind atlas for Sudan; international experts to support curricula development			recruitment process of IC
p.	Local consultants to support wind mapping, wind site surveying, bird migration and GIS systems to develop wind atlas for Sudan; local academics to participate in curricula development			SETCO Agreement for GIS hosting
q.	Long-term consultants and project staff	done		
r.	Workshops and meetings in Khartoum and at other Sudanese universities to support curricula development; workshops to consult on geomorphology, geology and land ownership			UKCC contract
s.	International travel to and from Khartoum, travel within Sudan to site locations and workshops	International WAsP training		
t.	International experts in wind mapping, wind site surveying and GIS systems to develop wind atlas for Sudan; international experts to support curricula development			WAsP training

u.	Local consultants to support wind mapping, wind site surveying, bird migration and GIS systems to develop wind atlas for Sudan; local academics to participate in curricula development			
v.	International travel to and from Khartoum, travel within Sudan to site locations and workshops	International WAsP training		
w.	Audit costs	2016 Audit		
x.	International and regional experts to support documentation of lessons-learned from Dongola wind farm and regional workshops			
y.	Local consultants to support documentation of lessons-learned from Dongola wind farm and regional workshops	website consultancy service		
z.	Long-term consultants and project staff	done		
aa.	Regional workshops for transferring knowledge and capacity to Sudan from relevant regional countries (e.g. Egypt, Morocco, Kenya); and to share and disseminate lessons-learned from Dongola	Morocco tour		
ab.	Travel for international consultants to and from Khartoum; travel for workshops and regional interaction		not done	
ac.	International and regional experts to support documentation of lessons-learned from Dongola wind farm and regional workshops		not done	
ad.	Local consultants to support documentation of lessons-learned from Dongola wind farm and regional workshops	website consultancy service		
ae.	Travel for international consultants to and from Khartoum; travel for workshops and regional interaction		not done	
af.	Regional workshops for transferring knowledge and capacity to Sudan from relevant regional countries (e.g. Egypt, Morocco, Kenya); and to share and disseminate lessons-learned from Dongola	Morocco tour		
ag.	Long-term consultants and project staff	done		
ah.	Travel for project management staff	travel to site(s) as per table above		
ai.	Computers, software, IT services and web hosting	done		

#### 4.10 Project level reporting, monitoring and evaluation systems

Reporting has generally been working satisfactorily well, apart from the timing of recruitment finalisation process for external project support experts which if done late, delays the spending of the next tranche of funds linked to particular aspects of the project for that area of expertise as this can only be done upon expert contracting approval by UNDP. To avert this timing constraint, the project partner must be encouraged to finalise the appointment of external project support experts early, say a working deadline of a month earlier than experts start date so that there is enough time for report reviewing which enables funds utilisation and future tranche disbursement. Otherwise project activities run delayed and which impacts negatively on expenditure and disbursements for the project.

Important lessons are being generated through the monitoring and evaluation products of project implementation which provides huge scope for the replication and scaling up of the project both to other parts of the country as well as to other regions of the world. The project-level monitoring and evaluation systems being used clearly capture details that include Project Outcomes, Outputs, Baselines Indicators and Targets, Planned Activities, Progress Against Planned Activities (Achievements), Expenditures and budget balance, which makes it easy to read and follow. The system also has additional information about major challenges that ranges from finalise contracting processes of external project experts to technical and coordination issues. From a project-level monitoring and evaluation perspective, the system is working satisfactorily well.

#### 4.11. Sustainability

##### 4.11.1 Financial risks to sustainability

Based on the current budget of this project, the major financial risk to sustaining what has been set up is medium with a very high impact should it happen. With the construction of the wind farm, the project won't be able to generate electricity that's fed into the grid and sold to generate income. The aim of attracting private investment into the sector might negatively suffer from a bad perception if the wind farm isn't constructed. As a result, financial and economic resources will likely not be available from the private sector at the current scale and level once the GEF assistance ends, unless the grid connected wind farm is constructed which is a precondition for the market to respond positively. Assuming the government picks up the financial tab of this project going forward, it won't be to at a very rapid pace at the scale of GEF. However, there are a lot of opportunities to access small chunks of financial and economic resources which when lumped together become significant like the Green Climate Fund (GCF). If connected well with other on-going projects being funded by other donors in the same project sites or similar sector of renewable energy, then the financial muscle might relatively stay the same if not increase.

Also, the huge financial burden of this project has been the high upfront start-up costs related to the baseline, which when the project ends will be very low as the private sector will pick up all these costs if it's coming in as Independent Power Producers (IPPs). As no high upfront start-up costs will be required from the state, but actually maintenance costs which are relatively cheaper and lower when compared to start-up costs will all be private sector borne. The beneficiaries will transition from being energy poor and energy access deprived because they will see the benefits of this project on their livelihoods by having clean energy/electricity. The capacity that been developed will stay there and utilised beyond the projects life's span. This needs to be thought about very clearly to retain the skills in the sector by growing it so that it creates employment opportunities to absorb the skilled personnel and further develop them. So the likelihood of financial and economic resources not being available at all once the GEF assistance ends (*considering potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes*) is medium with a very high impact should it happen. Resources will be there and it is merely a question of their scale.

##### 4.11.2 Socio-economic risks to sustainability

The project has very minimal social or political risks that may jeopardize sustainability of project outcomes that can be justified at present. The political risk was very high before the embargo was lifted and now that

it's been lifted, this is now a relatively low risk. At present evidence is suggesting very high levels of stakeholder ownership (including ownership by government including all affected departments' and other key stakeholders). Based on present evidence, this will be sufficient to allow for the project outcomes/benefits to be sustained. At present all the various key stakeholders see that it is in their own interests that the project benefits continue to flow and that all the outcomes are achieved even if it means at a varied scale so that demonstration is done. There is sufficient public / stakeholder awareness in support of the long-term objectives of the project. However, this awareness needs to be continually raised so that it translates into tangible outcomes delivery until the project ends, so that the level of outcomes delivered is increased. The lessons learned are being well documented by the Project Team on a continual basis and shared/transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future. However, there is scope to strengthen this by doing the communications and knowledge management through the use of innovative streams like video footages and DVDs in local languages around the benefits of renewable energy (clean energy) in Sudan. People who intend to scale up the projects activities long after it's finished can easily pick up the video footages and DVD to recap and bring themselves up to speed with the vision and lessons learnt from the project even when it ends. The access road construction and the NAMA development processes are well documented on video already and showcasing this project as one aspect of a broader renewable energy package will add weight and diversification credibility internationally if international financing is to be solicited.

#### **4.11.3 Institutional framework and governance risks to sustainability**

At present the current legal frameworks, policies, governance structures and processes pose very minimal risks that may jeopardize sustenance of the project benefits. The required systems that have been set up like the mechanisms for accountability, transparency, and technical knowledge transfer are well in place and functioning well. The barriers to the role of the private sector in the renewable energy sector have been well identified and addressed at a policy level. Wind energy is probably the strongest because of this project and the other renewable energy sub-sectors like solar can adjust them appropriately to suit their needs – so the basis is there and now well set/established. However, that said, the aspects of accountability, transparency, and technical knowledge transfers are all maintained. To ensure sustainability, however, there is a need to continue engaging with institutions of higher education and learning (e.g. Universities' and technical colleges) plus government structures like the zonal and regional levels to ensure the already generated political will doesn't yearn.

#### **4.11.4 Environmental risks to sustainability**

The environmental risks that may jeopardize sustenance of project outcomes are very minimal. The project is in predominantly energy scarce/strained regions i.e. energy poverty regions and in part is securing technologies for grid connected electricity, which guarantees them yields of cleaner energy. The design of the wind technology is already going to factor in low environmental conditions of Sudan which mitigates any technological environmental risks to sustainability as custom made technology is going to be used.

### **5 Recommendations and conclusions**

#### **5.1 Conclusions**

The mid-term review team concludes that PUSPG-WEP is on target to achieve most of the results that are intended by the project for both the medium-long-term. The grid-connected power generation from wind

farm process in Sudan has begun to be established which is the outcome prone to a higher risk than the rest of the outcomes due to 100 MW baseline financing whose reasons and mitigation measures have already been explained under outcome 1. However, this baseline risk has been noted with measures to mitigate the risk being suggested through four logical options that can be undertaken as part of adaptive management which will render the overall project a success at its end. This project thus far has led to strengthened institutions to progressively deliver universal access to basic services that are aligned with latest UNDP Strategic Plan in Sudan and aligns to the next generation Poverty Reduction Strategy Plan (PRSP) that Sudan is finalising.

In addition, early signs suggest that in the short – medium term the project has seen improved progress on the wind farm construction at the Dongola site. Experience sharing and exposure visits on successful power generation from wind farm practices has created good insights for good international standards and practice benchmarking for those involved on the project. Very strong local partnerships between the various stakeholders have been established and adequate progress has been made towards getting local Sudanese stakeholders to own the project. MWRE has even gone to the extent of creating a general directorate for this project's work and the renewable energy sector much more broadly. The training of personnel though welcomed as part of the project isn't doing justice to the current ripe atmosphere of demand for renewable energy sources that Sudan is showing. This makes the need to have a grid feeding demonstration wind turbine of paramount importance as one can't guarantee that trainees from this project will stay on without any wind farm to work on and learn from. The failure of not having any wind energy system feeding into the grid isn't giving a positive reflection on the intent even though the policy and legislative foundation has been laid down – having a wind turbine feeding into the grid irrespective of Mega Watt scale will send positive signals to the market and the renewables sector in Sudan which will trigger more investment interest as investors (domestic and abroad) would have seen Sudan's first wind farm feeding into the grid.

Overall, a cross-sectoral and forward-looking approach that satisfactorily considers the integrated and inter-related impacts such as budget reprioritisation is evident. Without this cross-sectoral approach, strategic cost-effective alternatives, such as project budget reallocation would not necessarily have been considered. The project is premised on the analysis and integration of climate change mitigation from the perspective of the sustainable livelihoods approach (SLA) where growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded. Livelihoods comprise the capabilities, assets and activities required for a means of living. Livelihoods are sustainable when investment in green energy and access by needy communities to sustainable energy improved is done while maintaining or enhancing capabilities and assets now and in the future. Five core asset categories are typically identified in the SLA: Human, social, physical, natural and financial. The approach helps improve understanding of the dynamic nature of livelihood and what influences them.

It builds on the private sector's strengths and opportunities to support existing livelihood strategies aided when government and stakeholders have evidence-based policies, strategic plans and mechanisms to ensure an enabling environment for improved basic services and people in Sudan, with special emphasis on populations in need, have access to equitable and sustainable quality basic services. It examines the influence of policies and institutions on livelihood options when it comes to energy poverty and highlights the need for policies that address the priorities of the poor whilst integrating energy policy analysis within the broader developmental objectives of Sudan. It encourages public-private partnerships and aims for sustainability i.e. establish regulatory frameworks for encouraging private investments in grid-connected wind energy in this project's case. From our perspective, all these are important elements of effective



mitigation to climate change where wind energy has been identified as a priority mitigation technology by the Government of Sudan. Change is a constant in the lives of energy poor people. For most developing countries like Sudan, climate change adds another layer of complexity to existing development challenges, such as high levels of poverty and inequality, rapid population growth, underdeveloped markets, poor infrastructure and service provision, and weak governance systems. As such development interventions like this in Sudan will need to help the Sudanese people and communities to adapt to the interaction of these new and old technological pressures. Since change is a constant, sustainable interventions can only be achieved if people can adapt them in the future to a changing context (OECD, 2008), which is what this project is doing.

## 5.2 Recommendations

The MTR of PUSPG-WEP has identified a number of issues that are presented below as recommendations per outcome for use in the project design going forward and implementation of similar projects in future.

### Outcome 1: Grid-connected power generation from wind farm introduced

i. The project is positively progressing towards achieving its development objectives. Under this component, the project site isn't preserved, protected or safe guarded from any encroachment threats from urban development and agricultural activities as it currently isn't enclosed. The installation of 100 MW capacity in Dongola was not achieved due to many reasons which were a big risk yet out of the control of the project team i.e. beyond the scope of this project's control due to the recently lifted embargo<sup>21</sup> that was imposed on Sudan and the snowball effects from the cessation of South Sudan from Sudan which impacted on Sudan national budget revenue from the formerly oil-rich regions lost when the South gained independence from Sudan. The biggest risk that has affected the project is how these get financed due to a +19-years embargo (*which has recently been lifted*) at scale due to high financing risks that made capital premiums too costly in relation to development priorities becoming a barrier to the necessary mainstreaming of wind energy in practice. For instance, the project activities were and are still viewed as a top priority that's imbedded as part of the day to day electricity diversification and development priority issues going forward by Sudan's central government. As such the installing of four (4) wind farms by the Ministry of Water Resources and Electricity (MWRE) was also not realised due to the fact the base line project was not implemented because there have been no budget available for it at present. Central government has shown a lot of commitment and desire to try and fund the baseline as evidenced by the attempts and options tried which are well documented in this report. However, large financing capacity from central government has been severely limited and significantly constrained at present.

At an institutional level, there appears to be very high levels of awareness among policy-makers and their staff about the benefits of renewable energy. The acceptance of new technologies takes time as people get acquainted and appreciate the performance of new technologies overtime. The review team notes that as a result of the embargo, ongoing focus has to ensure that the demonstration of grid-connected power generation from wind farm must be introduced as a risk aversion mechanism to the project's failure to achieve its intended objectives even if it's at a much smaller scale than originally planned as the context in which this project was planned and the current context after close to three full years of implementation are vastly different.

Grid-connected power generation from wind energy is also key to raise awareness, especially of communities, leaders, policy-makers and local community development practitioners. Focus can also be put on other small-scale wind energy easier to finance options which that can feed the grid (*centralised or*

<sup>21</sup> Defined by as <https://www.merriam-webster.com/dictionary/embargo> 1 : an order of a government prohibiting the departure of commercial ships from its ports. 2: a legal prohibition on commerce. a trade embargo.

*decentralised*) with potential to upscale in phases as and when more funds become available. This is important since grid connection is being used as a catalyst to demonstrate Sudan's commitment in renewable energy and instilling wind energy confidence in the private sector of what new government policy is whilst demonstrating how these relate to Sudan's development priorities to achieve effective mainstreaming of mitigation efforts through the implementation of new technologies being introduced through the project. Although the levels of awareness have significantly improved amongst stakeholder involved with this project since its implementation began, the review team is of the opinion that PUSPG-WEP should still provide opportunities for continued awareness raising in relation to grid-connected power generation from renewables to keep mainstreaming the overall renewable energy development agenda of local communities and the country.

**Recommendation:** The project site needs to be preserved, protected or safe guarded from any encroachment from urban development and agricultural activities as it currently isn't enclosed. Development doesn't need to first encroach into the buffer zone/region of the site before a decision to protect it is made. Once people or activities start to happen within the sites boundaries, it'll be difficult if not near impossible to move people off and efforts between all the relevant stakeholders to avoid this from happening is of paramount importance.

The failure to install a 100 MW grid-connected power generation capacity in Dongola can't be blamed on the project but the changing country context which transitioned and affected central government's financial ability. All things being equal it would have been achieved in full or partially at this stage, yet it remains a long-term possibility. However, to avoid the risk of weaning demand for wind energy (and renewables in general) after so much capacity, hype and awareness raising had been successfully done: Short to medium term risk aversion considerations must be done and a decision on which scope option to follow/take be done by December 2017 as the project will only be left with about 24 months (Jan 2018 – Dec 2019) before it ends. As a form of an urgent risk aversion mechanism whilst awaiting medium to long term positive market behaviours from the embargo upliftment, the review team suggests four (4) short to medium term time bound interventions for GEF and UNDPs in principle consideration (*listed below*) that will play an important role which demonstrate grid-connected power generation from wind. This must be done with the intention to put in place a wind energy NAMA that can sought funding at a much bigger scale through the NAMA funding windows as a spin off from this project as Sudan's Internal Nationally Determined Contributions INDC have mitigation as one of the aspects with wind energy forming part of that. Equally so the Green Climate Fund (GCF) can also be approached to fund a scaling up project of the proof of concept from this GEF supported project to make the most of the current gains made through the GEF support in order to pave the way for further market development and scaled wind energy uptake in the potential areas.

The suggested four (4) short to medium term time bound interventions stem from page 13 of the ProDoc motivation which states that *"the baseline project provides a unique opportunity to start addressing these barriers with a view to favouring private-sector investment in the market development of wind energy in the medium-to-long term. Some of these barriers, namely those related to the transfer of nationally-appropriate wind energy technologies, will be addressed directly in conjunction with the baseline project. In order to generate market acceptance at a time when wind technology does not exist in Sudan, it is crucial to first demonstrate the technological viability of wind energy in the local context. Any technological failure at the early stages in wind energy development will only undermine the acceptance of the technology in Sudan, resulting in an unwanted increase in yet more market barriers. Using the favourable conditions generated by the imminent Dongola wind farm to promote wind energy, other – broader – barriers will be addressed by the UNDP-implemented, GEF-financed project in order to pave the way for the market development of the Red Sea wind farm and beyond"*.

**Option 1:** (if no decision on the baseline funding by end of November 2017, then please trigger option 2)

- **Pursue central government baseline project funding** – Sudan's central government has reiterated its commitment to this project and now intends to trigger funding a 5MW baseline project to demonstrate

grid-connected power generation from wind energy. This option has been pursued to three (3 years on 31 December 2017) and has stalled in previous attempts due to the reasons already mentioned earlier. It's of paramount importance with government reiterating its commitment during this MTR that if no firm funding availability has been confirmed from central government by the end of November 2017 that option 2 is triggered. Bureaucratic systems take time and the project is almost 3 years into implementation with only 2 years left and the timing of triggering a decision has now become very critical if outcome 1 demonstration ambition is to be achieved.

**Option 2:** *(if no decision on the baseline funding by Mid Dec 2017, then please trigger option 3 below)*

- **Scope change as project reallocates a proportion of its outcome 1 budget** – consideration can be given to reallocating a proportion of the projects outcome 1 budget line items to fund a 1MW grid-connected power generation from wind demonstration plant. This will assist with proving the concept and also the disbursements of the funds as the bulk of the budget is allocated towards outcome 1 and can't be disbursed because the baseline hasn't been implemented as originally planned from central government funds and resulting in the project not being able to spend. Quotations and company offers received by MWRE early in 2017 alongside desktop internet research indicates that a 1MW costing in the range of USD\$1.2 million to USD\$2.4million.

**Option 3:** *(if no decision on the baseline funding by end of Dec 2017, then please trigger option 4 below)*

- **Scope change to small scale wind energy for water pumping** – Standalone of hybrid small scale wind turbines for water pumping as an opportunity to demonstrate grid-connected power generation from wind energy where grid refers to "power "grid," they're referring to the transmission system for electricity" (UCSUSA, 2015). Sudan has a history of wind energy (wind mills) being used to pump water for irrigation and other purposes stretching back from the 1980s. Given the baseline funding constraints, this is another option which can be used to demonstrate grid-connected power generation from wind for an electric grid, though decentralised in this instance. The GEF is already funding another demonstration project in the wind energy potential areas that's using solar energy for water pumping. Using wind could be another way of proving the concept and demonstrating how wind energy is equally good as a form of energy in these potential areas. This for example, is a community-based approach that provides opportunities for more awareness raising for wind energy as one type of a renewable energy source in order to keep mainstreaming low capital and low risk options in wind energy and renewable energy overall in Sudan. Increased awareness beyond the current levels will make it possible for the project to increase its coverage of promoting renewable energy adoption at the community level in Sudan. In the long term when the financial market confidence levels increase, large scale 100 MW capacity wind farms like Dongola will become a lot easier to finance and smaller scale interventions will serve Sudan well by practically demonstrating its appetite and commitment towards renewables<sup>22</sup>.

**Option 4:** *(if no decision on the baseline funding by end of Jan 2018, high risk & triggers no further options)*

- **Scope change to small scale wind energy for demonstration at Universities** – standalone of hybrid small scale wind turbines for powering university campuses or university water pumping as an opportunity to demonstrate grid-connected power generation from wind energy where grid refers to "power "grid," they're referring to the transmission system for electricity" (UCSUSA, 2015)<sup>23</sup>.

## **Outcome 2: Policy and institutional regulatory framework adopted**

This is one outcome which has been highly appreciated and seen as the key to barrier removal by all the stakeholders. The project's role in enabling a Feed-in-Tariff (FiT) was greatly commended and appreciated as ground breaking. The policy reforms and harmonisation of legislation to enable a private sector driven

<sup>22</sup> A 25kW wind turbine produces enough energy to power a small neighbourhood. These devices are also intended for agricultural and light industrial applications. It has also been used for years in remote village applications, where diesel power systems supply electricity for a small grid.

<sup>23</sup> A 100kW wind turbine produces enough energy to power 15+ homes. These are not residential turbines but are community-sized wind turbine that produce the right amount of power for school and university campuses, residential developments, farms, municipalities, and a variety of businesses ranging from injection moulding factories to extrusion houses. They can also be used in small wind farms for direct grid hookup.

wind energy market was also highly lauded by stakeholders and highlighted multiple times as something which wouldn't have been achieved if it wasn't for this project. Evidence on progress thus far shows that:

- The Environmental Impact Assessment (EIA) studies and reports were accomplished.
- The Feed-in-Tariff (FiT) policy document and NAMA project document and reports were produced.
- The policies and legislation for renewable energy are effectively adopted and enforced.

Overall, it is safe to conclude that at this MTR stage the policy, legislative and institutional regulatory framework has been well adopted to a large extent with a few action points that are being finalised over the final duration of the project.

**Recommendation:** PUSPG-WEP should aim to resolve the slight technicalities mentioned about a standardised FiT that makes it attractive for new entrants' players to enter the market at various scales. The private sector can play a significant role with complementation of households and small businesses that can generate renewable energy at various scales which can be fed into the grid during the day and vice-versa at night. Investors at all scales seeing the adopted policy, legislative and institutional regulatory framework in practice will also enable a community-based approach from technologies that can be benefited from. PUSPG-WEP's responsibility would be restricted more to making sure implementation is fully beneficial by adopting these renewable technologies in line with the policy, legislative and institutional regulatory framework. Otherwise, a negative reputation of the project might emerge when the technology is partially implemented and does not also fully provide the benefits to the local communities by also enabling smaller players to become active in the sector.

### **Outcome 3: The wind technology support and delivery system strengthened**

The wind technology support and delivery system has been strengthened with a lot of technical training and learnings being undertaken from similar projects and contexts elsewhere which is very good. Evidence on progress thus far shows that:

- 65 engineers were trained in wind technology (49 males and 16 females).
- Three (3) institutions have been supported in wind technology.
- Wind maps and atlas version 1.0 was developed.

**Recommendation:** As a medium-to-long term technology support and delivery system strengthening, the involvement of most of the institutions of higher learning and higher education from the potential wind farm locations needs to be strengthened. This should aim to build localised skills, capacity and expertise now that's this exists at a national level on aspects raised during the MTR like (1) wind energy planning; (2) wind assessment software; (3) Designing and assessing wind energy. Even if it's at their own costs through Master's and Doctoral students as a start – it triggers the technology support and delivery system strengthening from a very early stage of local graduates as the project can't simply rely on experts to come in from Khartoum for certain simple aspects which local well capacitated technicians can do. More of these localised institutions need to start becoming active players in the renewable energy sector and be part of the learnings of this process to build local capacity and capability within this sphere of expertise at a localised level. Hybrid-ing wind energy with solar on solar powered agricultural farms for water pumping to be financed by farm owners is another avenue which is explored will cooperation from Institutions of higher education will add value to the notion of wind technology support and strengthen the delivery system. This is an area that will be required on an ongoing basis beyond the construction phase of the Dongola wind farm as it determines how the local pool of expertise is developed for a stronger Sudanese renewable energy sector.

### **Outcome 4: Adaptive learning and replication plan supported.**

Evidence on progress thus far shows that amongst others, one (1) study tour was undertaken to wind plants in Morocco (composition included 50% female and 50% male). In this component, the project also has another fifth outcome on project management were evidence on progress shows that:

- The project management unit was established and is operational.
- The project's Board representing (PB) different stakeholders was established and is operational.

- The project's Technical Committee (PTC) representing different stakeholders was established and is operational.

**Recommendation:** as part of Adaptive learning, the 100MW baseline project should be viewed as a learning curve and the learnings adapted by going for a lesser ambitious yet immediately fundable intervention to prove the concept as recommended in outcome 1 above. A changing context in transition which Sudan found itself in pre-project implementing and now during implementation requires adaptive learnings to be drawn out of it and that the replication plan factors this risk very well and how it can be mitigated. Adopting a targeted approach for the remaining Adaptive learnings to be offered towards an identified niche would be more strategic and impactful. No desktop baseline survey on renewable energy skills or expertise required in the sector in Sudan was done for this phase of the project for the different stakeholders. Only the Electricity Regulatory Authority (ERA) submitted a list whilst the rest of the other stakeholders didn't. It's worth having a survey done (*even if it's a simple desktop exercise in consultation with the institutions of higher learning and education*) to guide targeted training prioritisation. So that the training and capacity building interventions going forward are more targeted and adapted to the immediate gaps/needs as a range of useful skills development has been undertaken thus far as intended.

**Table 15: Project Outputs and Related Target(s) as of October 2017**

Progress towards achievement of Project Outcomes

	Baseline	Targets End of Project	Progress	Percentage
<b>Project Objective<sup>24</sup></b>  To overcome barriers to the market development of utility-scale wind farms in Sudan.	Current Renewable energy master plan	put in place Sudan renewable energy policy, law and regulation	RE law and policies was drafted	20%
	0 MW	Installing 100 MW capacity in Dongola	0	0
	0 MWH	Generating of 300,917 MWh/year from wind energy.	0	0
<b>Outcome 1<sup>25</sup></b>  Grid-connected power generation from wind farm introduced.	1.1 - No MW produced from WP.	1.1 - 100 MW of grid-connected wind power installed at Dongola wind farm.	0.	0
	1.2 – 0 wind farms	1.2 – Installing 4 wind farms (The Ministry of Water Resources and Electricity (MWRE) has a plan to build four wind farms).	0	0
<b>Outcome 2</b>  Policy, institutional and regulatory framework adopted.	2.1 - No, guideline existed	2.1 – Two guidelines for wind farm-specific EIA considerations (e.g. migrating birds, noise) and other hazards (e.g. civil and military aviation) developed.	2.1 - EIA studies and reports were conducted including migratory birds, noise, and civil and military aviation	100
	2.2 - No SOPs	2.2 – SOPs for wind power plant is developed	0	0
	2.3 No feed-in tariff policy existed	2.3 - feed-in tariff policy NAMA for wind power in Sudan developed	2.3 – Inception report of FiT policy document and	20%

<sup>24</sup>Objective (Atlas output) monitored quarterly ERBM and annually in APR/PIR<sup>25</sup>All outcomes monitored annually in the APR/PIR. It is highly recommended not to have more than 4 outcomes.

	Baseline	Targets End of Project	Progress	Percentage
			NAMA project document and reports.	
	2.4 - A bill has been drafted for RE policies.	2.4 - policies and legislation for renewable energy are effectively adopted and enforced	2.4 - Project monitoring reports and final evaluation. (end of the project)	
<b>Outcome 3</b> The wind technology support and delivery system <b>Strengthened</b> .	3.1 - Preliminary wind measurements have been carried out as well as some feasibility assessments based on those measurements.	3.1.A - 100 engineers trained in wind technology (50 males & 50 females). 3.1.B - 5 institutions supported in wind technology.	1.1 (65) Engineers trained	65 %
			1.2 (3) Institutions were supported	60 %
	3.2 - MWRE has developed a wind atlas based on extrapolation of world data with high probability of inaccuracy.	3.2 – Wind atlas developed	3.2 - Wind maps and atlas - Wind Atlas Version 1.0 was developed.	20%
<b>Outcome 4</b> Adaptive learning and replication plan supported.	4.1 - There is currently no plan for compiling and disseminating lessons-learned in wind power.	4.1 - Establishment of a quality management certification process (e.g. ISO 9001) for Dongola wind farm.	4.1 - Project reports. Obtaining the quality management certificate.	0
	4.2 - Limited exchange of experiences with neighbouring countries with established wind farm like Egypt and Ethiopia.	4.2 – Ten Study tours undertaken to wind plants in the neighboring countries (including 50% female and 50% male).	4.2 - Project reports and annual work plans. - Morocco tour	10%

Source of data: ProDoc, Project Technical Reports, Interviews in the Field

## 7.0 Annexes

### Annex 1: Mid Term Review(MTR) Methodology Matrix

Term of Reference	Method	Expected Result
<b>Project Strategy</b>		
<b>TOR 1:</b> Assessment of the Project Strategy	Literature review, key informant interviews	An assessment of the project strategy, the project design, problem conceptualization including indicators of achievement of the output and the outcome.
TOR1.1: Review Project design	Literature review, key informant interviews, Stakeholder analysis, field visits	Review the problem addressed by the project and the underlying assumptions. Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)? Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes? Review the extent to which relevant gender issues were raised in the project design.
TOR 1.2: Results Framework / Logframe	Literature review, key informant interviews, Stakeholder analysis, field visits	<p>Critical analysis of the project's logframe indicators and targets, assess how "SMART" the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.</p> <p>Determine if the project's objectives and outcomes or components are clear, practical, and feasible within its time frame?</p> <p>Examine if progress so far has led to, or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women's empowerment, improved governance etc...) that should be included in the project results framework and monitored on an annual basis.</p> <p>Examine to ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators and indicators that capture development benefits.</p>



<b>Progress Towards Results</b>		
<b>TOR 2:</b> Progress Towards Outcomes Analysis (Outcomes 1 – 4) <sup>26</sup>	Literature review, key informant interviews, Stakeholder analysis, field visits	Review the logframe indicators against progress made towards the end-of-project targeting the Progress Towards Results Matrix and following the <i>Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects</i> ; colour code progress in a “traffic light system” based on the level of progress achieved; assign a rating on progress for each outcome; make recommendations from the areas marked as “Not on target to be achieved” (red).
In addition to the progress towards outcomes analysis	Literature review, key informant interviews	<p>Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.</p> <p>Identify remaining barriers to achieving the project objective in the remainder of the project.</p> <p>Reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.</p>
<b>Project Implementation and Adaptive Management</b>		
<b>TOR 3.1:</b> Management Arrangements.	Literature review and key informant interviews	<p>Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.</p> <p>Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.</p> <p>Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.</p>
<b>TOR 3.2:</b> Work Planning	Literature review and key informant interviews	<p>Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.</p> <p>Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?</p>

<sup>26</sup> Outcomes:

- Outcome 1: Power generation from wind energy resources increased.
- Outcome 2: Policy and institutional regulatory framework adopted.
- Outcome 3: The wind technology support and delivery system Strengthened
- Outcome 4: Adaptive learning and replication plan supported

		Examine the use of the project's results framework/logframe as a management tool and review any changes made to it since project start.
<b>TOR 3.3:</b> Finance and co-finance	Literature review and key informant interviews	<p>Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.</p> <p>Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.</p> <p>Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?</p> <p>Review the physical financial progress of the different project outcomes at MTR to see if there is need for any budget relocation.</p> <p>Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?</p>
<b>TOR 3.4:</b> Project-level Monitoring and Evaluation Systems	Literature and Key informant and logframe analysis	<p>Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?</p> <p>Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?</p>
<b>TOR 3.5:</b> Stakeholder Engagement	Key informant and literature review; field visits	<p>Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?</p> <p>Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?</p> <p>Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?</p>

<b>TOR 3.6:</b> Reporting	Key informant interviews, Review of relevant project documents and work plans	<p>Assess how adaptive management changes have been reported by the project management and shared with the Project Board.</p> <p>Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?).</p> <p>Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.</p>
<b>TOR 3.7:</b> Communications	Review of project document, work plans; key informant interviews	<p>Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?</p> <p>Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)</p> <p>For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.</p>
<b>Sustainability</b>		
<b>TOR 4:</b> Sustainability	Key informant interviews; field visits	Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
TOR 4.1: Financial risks to sustainability	Project literature review; key informant interviews	What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, Independent Private Partnership, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes)?
TOR 4.2: Socio-economic risks to sustainability	Project literature review; key informant interviews	Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and

		shared/ transferred to appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?
TOR 4.3: Institutional Framework and Governance risks to sustainability	Project literature review; key informant interviews	Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustenance of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.
TOR 4.4: Environmental risks to sustainability	Project literature review; key informant interviews	Are there any environmental risks that may jeopardize sustenance of project outcomes?

## Annex 1: MTR TOR (excluding ToR annexes)

**Project Name: "Promoting Utility Scale Power Generation from Wind Energy - 00090222"**  
**Period of assignment: 15 working days**  
**Duty Station: Khartoum with 1 visits to project sites in Northern State**

### 1. INTRODUCTION

This is the Terms of Reference (ToR) for the UNDP-GEF Midterm Review (MTR) of the full sized project titled *Promoting Utility Scale Power Generation from Wind Energy* (PIMS4726) implemented through the Ministry of Water Resources, Irrigation and Electricity which is to be undertaken in 2014. The project started on the 4<sup>th</sup> of December 2014 and is in its third year of implementation. In line with the UNDP-GEF Guidance on MTRs, this MTR process was initiated before the submission of the second Project Implementation Report (PIR). This ToR sets out the expectations for this MTR. The MTR process must follow the guidance outlined in the document *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects*. ([http://webundp.org/evaluation/documents/guidance/GEF-mid-term/Guidance\\_Midterm%20Review%20EN\\_2014.pdf](http://webundp.org/evaluation/documents/guidance/GEF-mid-term/Guidance_Midterm%20Review%20EN_2014.pdf))

### 2. PROJECT BACKGROUND INFORMATION

The project was designed to: Support removal of barriers to the adoption of utility-scale wind energy tied to the national grid in Sudan. Wind energy has been identified as a priority mitigation technology by the Government of Sudan, and, although it is a mature technology globally, it has not yet been adopted in Sudan. A systems approach is proposed to integrate energy policy analysis within the broader developmental objectives of Sudan. The project will also establish regulatory frameworks for encouraging private investments in grid-connected wind energy. Sudan currently has plans to develop utility-scale wind farms in four regions: Dongola in the North, Nyala in the South, the Red Sea coastal region and Khartoum.

The project includes four components: the implementation of an initial wind farm; support to policy and regulatory development, particularly to encourage private sector participation; strengthening the support for wind technology in the country; and support an adaptive learning and replication plan. Support to the implementation of the first wind farm in Sudan, Dongola, will align the wind farm with international best practices. It will also create a case study for replication in later wind farms. The Dongola wind farm will be implemented in five phases over the lifetime of the UNDP-implemented, GEF-financed project. This phasing will allow lessons-learned in it to be applied in the later phases and, perhaps more importantly, will provide five years of continuous wind farm construction-commissioning-operation that will serve as a laboratory for training personnel and developing associated tools and guidelines. The opportunity to have such continuous exposure is very rare and will assist in transferring knowledge and experience to neighbouring countries.

The project aims to help diversify Sudan's power sources and reduce its reliance on fossil fuels,

### 3. OBJECTIVES OF THE MTR

The MTR will assess progress towards the achievement of the project objectives and outcomes as specified in the Project Document, and assess early signs of project success or failure with the goal of identifying the necessary changes to be made in order to set the project on-track to achieve its intended results. The MTR will also review the project's strategy, its risks to sustainability.

### 4. MTR APPROACH & METHODOLOGY

The MTR must provide evidence based information that is credible, reliable and useful. The MTR team will review all relevant sources of information including documents prepared during the preparation phase (i.e. PIF, UNDP Initiation Plan, UNDP Environmental & Social Safeguard Policy, the Project Document, project reports including Annual Project Review/PIRs, project budget revisions, lesson learned reports, national strategic and legal documents, and any other materials that the team considers useful for this evidence-based review). The MTR team will review the baseline GEF focal area Tracking Tool submitted to the GEF at CEO endorsement, and the midterm GEF focal area Tracking Tool that must be completed before the MTR field mission begins.

The MTR team is expected to follow a collaborative and participatory approach<sup>1</sup> ensuring close engagement with the Project Team, government counterparts (the GEF Operational Focal Point), the UNDP Country Office(s), UNDP-GEF Regional Technical Advisers, and other key stakeholders.

Engagement of stakeholders is vital to a successful MTR.<sup>2</sup> Stakeholder involvement should include interviews with stakeholders who have project responsibilities, including but not limited to:

1. Ministry of Environment, Forestry & Natural Resources
2. Affairs - Ministry of Petroleum
3. Higher Council for Environment & Natural Resources
4. National Energy Research Centre – Ministry of Sciences and Communications
5. General Directorate of Renewable and Alternative Energy
6. Project Board members
7. Universities and energy related institutions

Additionally, the MTR team is expected to conduct field missions to Sudan, including a visit to the Northern State - *Dongola Wind Site*.

The final MTR report should describe the full MTR approach taken and the rationale for the approach making explicit the underlying assumptions, challenges, strengths and weaknesses about the methods and approach of the review.

<sup>1</sup> For ideas on innovative and participatory Monitoring and Evaluation strategies and techniques, see [UNDP Discussion Paper Innovations in Monitoring & Evaluation Tools](#), 05 Nov. 2013.

<sup>2</sup> For more stakeholder engagement in the MTR process, see the [UNDP Handbook on Planning, Monitoring and Evaluating for Development Results](#), Chapter 3, pg. 33.

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Table: Progress Towards Results Matrix (Achievement of Outcomes against End-of-Cycle Targets)

Project Strategy	Indicator <sup>1</sup>	Baseline <sup>2</sup>	Level in MTR <sup>3</sup> (self-reported)	Midterm Target <sup>4</sup>	End-of-project Target <sup>5</sup>	Midterm Level & Assessment <sup>6</sup>	Achievement Rating <sup>7</sup>	Justification for Rating
Objective:	Indicator (if applicable)							
Outcome 1:	Indicator 1:							
	Indicator 2:							
Outcome 2:	Indicator 3:							
	Indicator 4:							
Etc.	Etc.							

**Indicator Assessment Key**

Green= Achieved	Yellow= On target to be achieved	Red= Not on target to be achieved
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In addition to the progress towards outcomes analysis:

- Compare and analyse the GEF Tracking Tool at the Baseline with the one completed right before the Midterm Review.
- Identify remaining barriers to achieving the project objective in the remainder of the project.
- By reviewing the aspects of the project that have already been successful, identify ways in which the project can further expand these benefits.

**iii. Project Implementation and Adaptive Management****Management Arrangements:**

- Review overall effectiveness of project management as outlined in the Project Document. Have changes been made and are they effective? Are responsibilities and reporting lines clear? Is decision-making transparent and undertaken in a timely manner? Recommend areas for improvement.

<sup>3</sup> Populate with data from the Logframe and corewords

<sup>4</sup> Populate with data from the Project Document

<sup>5</sup> If available

<sup>6</sup> Colour code this column only

<sup>7</sup> Use the 6 point Progress Towards Results Rating Scale: HS, S, MS, MU, U, HU

**5. DETAILED SCOPE OF THE MTR**

The MTR team will assess the following four categories of project progress. See the *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for extended descriptions.

- Project Strategy,
- Progress Towards Results,
- Project Implementation and Adaptive Management, and
- Sustainability

**i. Project Strategy****Project design:**

- Review the problem addressed by the project and the underlying assumptions. Review the effect of any incorrect assumptions or changes to the context to achieving the project results as outlined in the Project Document.
- Review the relevance of the project strategy and assess whether it provides the most effective route towards expected/intended results. Were lessons from other relevant projects properly incorporated into the project design?
- Review how the project addresses country priorities. Review country ownership. Was the project concept in line with the national sector development priorities and plans of the country (or of participating countries in the case of multi-country projects)?
- Review decision-making processes: were perspectives of those who would be affected by project decisions, those who could affect the outcomes, and those who could contribute information or other resources to the process, taken into account during project design processes?
- Review the extent to which relevant gender issues were raised in the project design. See Annex 9 of *Guidance For Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects* for further guidelines.
- If there are major areas of concern, recommend areas for improvement.

**Results Framework/Logframe:**

- Undertake a critical analysis of the project's logframe indicators and targets, assess how "SMART" the midterm and end-of-project targets are (Specific, Measurable, Attainable, Relevant, Time-bound), and suggest specific amendments/revisions to the targets and indicators as necessary.
- Are the project's objectives and outcomes or components clear, practical, and feasible within its time frame?
- Examine if progress so far has led to or could in the future catalyse beneficial development effects (i.e. income generation, gender equality and women's empowerment, improved governance etc.) that should be included in the project results framework and monitored on an annual basis.
- Ensure broader development and gender aspects of the project are being monitored effectively. Develop and recommend SMART 'development' indicators, including sex-disaggregated indicators and indicators that capture development benefits.

**ii. Progress Towards Results****Progress Towards Outcomes Analysis:**

- Review the logframe indicators against progress made towards the end-of-project targets using the Progress Towards Results Matrix. Review the Guidance for Conducting Midterm Reviews of UNDP-Supported, GEF-Financed Projects for extended descriptions.
- Assign GEF/line of business codes in a "traffic light system" based on the level of progress achieved: assign a rating on progress for each outcome; make recommendations from the areas marked as "Not on target to be achieved" (red).



- Review the quality of execution of the Executing Agency/Implementing Partner(s) and recommend areas for improvement.
- Review the quality of support provided by the GEF Partner Agency (UNDP) and recommend areas for improvement.

#### Work Planning:

- Review any delays in project start-up and implementation, identify the causes and examine if they have been resolved.
- Are work-planning processes results-based? If not, suggest ways to re-orientate work planning to focus on results?
- Examine the use of the project's results framework/ logframe as a management tool and review any changes made to it since project start.

#### Finance and co-finance:

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions.
- Review the changes to fund allocations as a result of budget revisions and assess the appropriateness and relevance of such revisions.
- Does the project have the appropriate financial controls, including reporting and planning, that allow management to make informed decisions regarding the budget and allow for timely flow of funds?
- Informed by the co-financing monitoring table to be filled out, provide commentary on co-financing: is co-financing being used strategically to help the objectives of the project? Is the Project Team meeting with all co-financing partners regularly in order to align financing priorities and annual work plans?

#### Project-level Monitoring and Evaluation Systems:

- Review the monitoring tools currently being used: Do they provide the necessary information? Do they involve key partners? Are they aligned or mainstreamed with national systems? Do they use existing information? Are they efficient? Are they cost-effective? Are additional tools required? How could they be made more participatory and inclusive?
- Examine the financial management of the project monitoring and evaluation budget. Are sufficient resources being allocated to monitoring and evaluation? Are these resources being allocated effectively?

#### Stakeholder Engagement:

- Project management: Has the project developed and leveraged the necessary and appropriate partnerships with direct and tangential stakeholders?
- Participation and country-driven processes: Do local and national government stakeholders support the objectives of the project? Do they continue to have an active role in project decision-making that supports efficient and effective project implementation?
- Participation and public awareness: To what extent has stakeholder involvement and public awareness contributed to the progress towards achievement of project objectives?

#### Reporting:

- Assess how adaptive management changes have been reported by the project management and shared with the Project Board.

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- Assess how well the Project Team and partners undertake and fulfil GEF reporting requirements (i.e. how have they addressed poorly-rated PIRs, if applicable?)
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

#### Communications:

- Review internal project communication with stakeholders: Is communication regular and effective? Are there key stakeholders left out of communication? Are there feedback mechanisms when communication is received? Does this communication with stakeholders contribute to their awareness of project outcomes and activities and investment in the sustainability of project results?
- Review external project communication: Are proper means of communication established or being established to express the project progress and intended impact to the public (is there a web presence, for example? Or did the project implement appropriate outreach and public awareness campaigns?)
- For reporting purposes, write one half-page paragraph that summarizes the project's progress towards results in terms of contribution to sustainable development benefits, as well as global environmental benefits.

#### iv. Sustainability

- Validate whether the risks identified in the Project Document, Annual Project Review/PIRs and the ATLAS Risk Management Module are the most important and whether the risk ratings applied are appropriate and up to date. If not, explain why.
- In addition, assess the following risks to sustainability:

##### Financial risks to sustainability:

- What is the likelihood of financial and economic resources not being available once the GEF assistance ends (consider potential resources can be from multiple sources, such as the public and private sectors, income generating activities, and other funding that will be adequate financial resources for sustaining project's outcomes)?

##### Socio-economic risks to sustainability:

- Are there any social or political risks that may jeopardize sustainability of project outcomes? What is the risk that the level of stakeholder ownership (including ownership by governments and other key stakeholders) will be insufficient to allow for the project outcomes/benefits to be sustained? Do the various key stakeholders see that it is in their interest that the project benefits continue to flow? Is there sufficient public / stakeholder awareness in support of the long term objectives of the project? Are lessons learned being documented by the Project Team on a continual basis and shared/ implemented by appropriate parties who could learn from the project and potentially replicate and/or scale it in the future?

##### Institutional Framework and Governance risks to sustainability:

- Do the legal frameworks, policies, governance structures and processes pose risks that may jeopardize sustainability of project benefits? While assessing this parameter, also consider if the required systems/ mechanisms for accountability, transparency, and technical knowledge transfer are in place.

##### Environmental risks to sustainability:

- Are there any environmental risks that may jeopardize sustainability of project outcomes?

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## 6. TIMEFRAME

The total duration of the MTR will be **15 days over a time period of 8 weeks starting 1<sup>st</sup> August 2017**, and shall not exceed five months from when the consultant(s) are hired. The tentative MTR timeframe is as follows:

TIMEFRAME	ACTIVITY
15/ August/ 2017	Application closes
30/ August/ 2017	Select MTR Team
5/ Sept/ 2017	Prep the MTR Team (handover of Project Documents)
20/ Sept/ 2017	Document review and preparing MTR Inception Report
27/ Sept/ 2017	Finalization and Validation of MTR Inception Report: latest start of MTR mission
8/ Oct/ 2017	MTR mission: stakeholder meetings, interviews, field visits
12/ Oct/ 2017	Mission wrap-up meeting & presentation of initial findings-earliest end of MTR mission
17/ Oct/ 2017	Preparing draft report
19/ Oct/ 2017	Incorporating audit trail from feedback on draft report/Finalization of MTR report (note: accommodate time delay in dates for circulation and review of the draft report)
23/ Oct/ 2017	Preparation & Issue of Management Response (optional) Concluding Stakeholder Workshop (not mandatory for MTR team)
25/ Oct/ 2017	Expected date of full MTR completion
1/ Nov/ 2017	

Options for site visits should be provided in the Inception Report.

## 7. MIDTERM REVIEW DELIVERABLES

#	Deliverable	Description	Timing	Responsibilities
1	MTR Inception Report	MTR team clarifies objectives and methods of Midterm Review	No later than 2 weeks before the MTR mission starts 27/Sept/ 2017	MTR team submits to the Commissioning Unit and project management
2	Presentation	Initial Findings	End of MTR mission: 8/Oct/2017	MTR Team presents to project management and the Commissioning Unit
3	Draft Final Report	Full report (using guidelines on content outlined in Annex B) with annexes	Within 3 weeks of the MTR mission: 17/Oct/2017	Sent to the Commissioning Unit, reviewed by RTA, Project Coordinating

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## Conclusions &amp; Recommendations

The MTR team will include a section of the report testing out the MTR's evidence-based conclusions, in light of the findings.<sup>6</sup>

Recommendations should be succinct suggestions for critical intervention that are specific, measurable, achievable, and relevant. A recommendation table should be put in the report's executive summary. See the *Guidelines for Preparing Midterm Reports of UNDP-Operated GIEF-funded Projects* for guidance on a recommendation table.

The MTR team should make no more than 15 recommendations total.

## Ratings

The MTR team will include its ratings of the project's results and brief descriptions of the associated achievements in a *MTR Ratings & Achievement Summary Table* in the Executive Summary of the MTR report. See Annex E for ratings scales. No rating on Project Strategy and no overall project rating is required.

Table: MTR Ratings & Achievement Summary Table for *Project Title*

Measure	MTR Rating	Achievement Description
Project Strategy	N/A	
Progress Towards Results		
Objective Achievement Rating: (rate 6 pt. scale)		
Outcome 1 Achievement Rating: (rate 6 pt. scale)	1	
Outcome 2 Achievement Rating: (rate 6 pt. scale)	2	
Outcome 3 Achievement Rating: (rate 6 pt. scale)	3	
Etc.		
Project Implementation & Adaptive Management Sustainability	(rate 6 pt. scale)	
	(rate 4 pt. scale)	

<sup>6</sup> Alternatively, MTR conclusions may be integrated into the body of the report.

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### 13. PAYMENT MODALITIES AND SPECIFICATIONS

100% of payment upon approval of the final MTR Inception Report  
50% upon submission of the draft MTR report  
40% upon finalization of the MTR report

#### 4. APPLICATION PROCESS<sup>9</sup>

### Recommended Presentation of Proposal:

- CV and a Personal History Form (PH Form)<sup>3</sup>.**
- Brief description of approach to work/technical proposal of why the individual considers the assignment to be a challenge and a proposed methodology on how they will approach and complete the assignment; (max 1 page)**
- Financial Proposal that indicates the all-inclusive fixed total contract price and all other related costs (such as flight tickets, per diem, etc.), supported by a breakdown of costs, per template attached to the Letter of Confirmation of interest template. If an applicant is employed by an organization, the Financial Proposal should include the organization's contribution to the process of releasing him/her to UNDP after Remunerable Loan Agreement (RLA); the**

<sup>8</sup> Engagement of the consultants should be done in line with guidelines for hiring consultants in the COPP; <http://info.worldbank.org/pbi/atlas.aspx?Pages=AtlasIndex>.

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				Unit, GHF OWP Sent to the Commissioning Unit
4	Final Report*	Revised report with audit detailing how all received comments have (and have not) been addressed in the final MTR report	Within 1 week of receiving UNDP comments on draft <i>28/Oct/2017</i>	

The final MTR report must be in English. If applicable, the Commissioning Unit may choose to arrange for a translation of the report into a language more widely shared by national stakeholders.

### MTR ARRANGEMENTS

The principal responsibility for managing this MTR resides with the Commissioning Unit. The Commissioning Unit for this project's MTR is *UNDP Sudan Country Office*.

The commissioning unit will contract the consultants and ensure the timely provision of per diems and travel arrangements within Sudan for the MTR team. The Project Team will be responsible for liaising with the MTR team to provide all relevant documents, set up stakeholder interviews, and arrange field visits.

#### TEAM COMPOSITION

**TEAM COMPOSITION** - The team of two independent consultants will conduct the MTR - one team leader (with experience and exposure to projects and evaluations in other regions globally) and one team expert, usually from the country of the project. The consultants cannot have participated in the project preparation, formulation, and/or implementation (including the writing of the Project Document) and should not have a conflict of interest with project's related activities.

### 10. REQUIRED SKILLS AND EXPERIENCE

### Qualifications

- A Master's degree in energy, environment, climate or other closely related field.
- experience:**
- Work experience in relevant technical areas for at least 10 years;
  - Demonstrated understanding of issues related to gender and Climate Change Adaptation and Sustainable Development; experience in gender sensitive evaluation and analysis;
  - Experience applying SMART indicators and reconstructing or validating baseline scenarios;
  - Experience in adaptive management, as applied to Climate Change Adaptation and Sustainable Development;
  - Experience working with the GEF or GEF-evaluations;
  - Recent experience with result-based management methodologies;
  - Project evaluation/review experiences within United Nations system will be considered an asset.

**Language Requirements:**

- Fluency in written and spoken English is essential.

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applicant must indicate at this point, and ensure that all such costs are duly incorporated in the financial proposal submitted to UNDP. All application materials should be submitted online following the online applications steps.

**Criteria for Evaluation of Proposal:** Only those applications which are responsive and compliant will be evaluated. Offers will be evaluated according to the Combined Scoring method—where the educational background and experience on similar assignments will be weighted at 70% and the price proposal will weigh at 30% of the total scoring. The applicant receiving the Highest Combined Score that has also accepted UNDP's General Terms and Conditions will be awarded the contract.

ToR ANNEX A: List of Documents to be reviewed by the MTR Team

1. PIF
  2. UNDP Initiation Plan
  3. UNDP Project Document
  4. UNDP Environmental and Social Screening results
  5. Project Inception Report
  6. All Project Implementation Reports (PIR's)
  7. Quarterly progress reports and work plans of the various implementation task teams
  8. Audit reports
  9. Finalized GEF focal area Tracking Tools at CEO endorsement and mid-term (*Leave One Change Mitigation*)
  10. Oversight mission reports
  11. All monitoring reports prepared by the project
  12. Financial and Administration guidelines used by Project Team
- The following documents will also be available:
13. Project operational guidelines, manuals and systems
  14. UNDP country/country programme document(s)
  15. Minutes of the **(Promoting Utility Scale Power Generation from Wind Energy)** Board Meetings and other meetings (i.e. Project Appraisal Committee meetings)
  16. Project site location maps

ToR ANNEX B: Guidelines on Contents for the Midterm Review Report<sup>12</sup>

- i. Basic Report Information (*for opening page or title page*)
  - Title of UNDP supported GEF financed project
  - UNDP PINSH and GEF project ID#
  - MTR time frame and date of MTR report
  - Region and countries included in the project
  - GEF Operational Focal Area/Strategic Program
  - Executing Agency/Implementing Partner and other project partners
  - MTR team members
- ii. Acknowledgements
- iii. Table of Contents
- iv. Acronyms and Abbreviations
1. Executive Summary (*3-5 page*)

<sup>12</sup> The Report length should not exceed 40 pages in total (not including annexes).

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- Project Information Table
- Project Description (brief)
- Project Progress Summary (between 200-500 words)
- MTR Ratings & Achievement Summary Table
- Concise summary of conclusions
- Recommendation Summary Table
- 2. Introduction (*2-3 page*)
  - Purpose of the MTR and objectives
  - Scope & Methodology: principles of design and execution of the MTR, MTR approach and data collection methods, limitations to the MTR
- 3. Project Description and Background Context (*3-5 page*)
  - Structure of the MTR report
  - Development context: environmental, socio-economic, institutional, and policy factors relevant to the project objective and scope
  - Problems that the project sought to address: threats and barriers targeted
  - Project Description and Strategy: objective, outcomes and expected results, description of field sites (if any)
  - Project Implementation Arrangements: short description of the Project Board, key implementing partner arrangements, etc.
  - Project timing and milestones
  - Main stakeholders summary list
- 4. Findings (*12-14 page*)
  - 4.1 Project Strategy
    - Project Design
    - Results Framework/Logframe
  - 4.2 Progress Towards Results
    - Progress towards outcomes analysis
    - Remaining barriers to achieving the project objective
  - 4.3 Project Implementation and Adaptive Management
    - Management Arrangements
    - Work planning
    - Finance and co-finance
    - Project-level monitoring and evaluation systems
    - Stakeholder engagement
    - Reporting
    - Communications
  - 4.4 Sustainability
    - Financial risks to sustainability
    - Socio-economic to sustainability
    - Institutional framework and governance risks to sustainability
    - Environmental risks to sustainability
- 5. Conclusions and Recommendations (*4-6 page*)
  - 5.1 Conclusions

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Project Implementation and Adaptive Management Has the project been implemented efficiently, cost-effectively, and been able to adapt to any changing conditions thus far?	
To what extent are project-level monitoring and evaluation systems, reporting, and project communications supporting the project's implementation?	
Sustainability: To what extent are there financial, institutional, socio-economic, and/or environmental risks to sustaining long-term project results?	

- Comprehensive and balanced statements (that are evidence-based and connected to the MTR's findings) which highlight the strengths, weaknesses and results of the project
- Corrective actions for the design, implementation, monitoring and evaluation of the project
- Actions to follow up or reinforce initial benefits from the project
- Proposals for future directions underlining main objectives

5.2 Recommendations

6. Annexes

- MTR ToR (excluding ToR annexes)
- MTR evaluative matrix (evaluation criteria with key questions, indicators, sources of data, and methodology)
- Example Questionnaire or Interview Guide used for data collection
- Ratings Scales
- MTR mission itinerary
- List of persons interviewed
- List of documents reviewed
- Co-financing table (if not previously included in the body of the report)
- Signed UNEG Code of Conduct form
- Signed MTR final report clearance form
- *Annexed in a separate file:* Audit trail from received comments on draft MTR report
- *Annexed in a separate file:* Relevant midterm tracking tools (*METT, FVC, Capacity Statement, etc.*)

ToR ANNEX C: Midterm Review Evaluative Matrix Template

Evaluative Questions	Indicators	Sources	Methodology
Project Strategy: To what extent is the project strategy relevant to country priorities, country ownership, and the best route towards expected results? (include evaluative question(s))	(i.e. relationships established, level of coherence between project design and implementation approach, specific activities conducted, quality of risk mitigation strategies, etc.)	(i.e. documents, national policies or strategies, websites, project staff, project partners, data collected throughout the MTR mission, etc.)	(i.e. document analysis, data analysis, interviews with project staff, interviews with stakeholders, etc.)
Progress Towards Results: To what extent have the expected outcomes and objectives of the project been achieved thus far?			

ToR ANNEX D: UNEG Code of Conduct for Evaluators/Midterm Review Consultants<sup>13</sup>

**Evaluators' Commitments:**

1. Must present information that is complete and fair in its assessment of strengths and weaknesses so that decisions or actions taken are well founded.
2. Must disclose the full set of evaluation findings along with information on their limitations and have this accessible to all affected by the evaluation with expressed legal rights to receive results.
3. Should protect the anonymity and confidentiality of individual informants. They should provide maximum notice, minimize demands on time, and respect people's right not to engage. Evaluators must respect people's right to provide information in confidence. They should not use information provided in confidence for purposes not expected to evaluate the project. They should not use information provided in confidence to evaluate the performance of individuals or organizations, and must balance an evaluation of management functions with this general principle.
4. Sometimes uncover evidence of wrongdoing while conducting evaluations. Such cases must be reported discreetly to the appropriate investigative body. Evaluators should consult with other relevant oversight entities when there is any doubt about if and how issues should be reported.
5. Should be sensitive to beliefs, manners and customs and act with integrity and honesty in their relations with all stakeholders. They should not use their position to discriminate on the basis of race, ethnicity, gender, age, or other factors. They should avoid offending the dignity and self-respect of those persons with whom they come in contact in the course of the evaluation. Knowing that evaluation might negatively affect the interests of some stakeholders, evaluators should conduct the evaluation and communicate its purpose and results in a way that clearly respects the stakeholders' dignity and self-worth.
6. Are responsible for their performance and their product(s). They are responsible for the clear, accurate and fair written and/or oral presentation of study limitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

**MTR Consultant Agreement Form**

Agreement to abide by the Code of Conduct for Evaluation in the UN System:

Name of Consultant: \_\_\_\_\_

Name of Consultancy Organization (where relevant): \_\_\_\_\_

I confirm that I have received and understood and will abide by the United Nations Code of Conduct for Evaluation.

Signed at \_\_\_\_\_ (Place) on \_\_\_\_\_ (Date)

Signature: \_\_\_\_\_

## ToR ANNEX E: MTR Ratings

<sup>13</sup> [www.un.org/peacekeeping/codeofconduct](http://www.un.org/peacekeeping/codeofconduct)

Individual Contract (IC)  
ToR for International Consultant- Pre-Feasibility Study for the Green Climate Fund (GCF)

Ratings for Progress Towards Results: (one rating for each outcome and for the objective)	
6	Highly Satisfactory (HS)
The objective/outcome is expected to achieve or exceed all its end-of-project targets, without major shortcomings. The progress towards the objective/outcome can be presented as "good practice".	
5	Satisfactory (S)
The objective/outcome is expected to achieve most of its end-of-project targets, with only minor shortcomings.	
4	Moderately Satisfactory (MS)
The objective/outcome is expected to achieve most of its end-of-project targets but with significant shortcomings.	
3	Unsatisfactory (HU)
The objective/outcome is expected to achieve its end-of-project targets with major shortcomings.	
2	Unsatisfactory (U)
The objective/outcome is expected not to achieve most of its end-of-project targets.	
1	Highly Unsatisfactory (HU)
The objective/outcome has failed to achieve its midterm targets, and is not expected to achieve any of its end-of-project targets.	

Ratings for Project Implementation & Adaptive Management: (one overall rating)	
6	Highly Satisfactory (HS)
Implementation of all seven components – management arrangements, work planning, finance and co-finance, project-level monitoring and evaluation systems, stakeholder engagement, reporting, and communications – is leading to efficient and effective project implementation and adaptive management. The project can be presented as "good practice".	
5	Satisfactory (S)
Implementation of most of the seven components is leading to efficient and effective project implementation and adaptive management except for only few that are subject to remedial action.	
4	Moderately Satisfactory (MS)
Implementation of some of the seven components is leading to efficient and effective project implementation and adaptive management, with some components requiring remedial action.	
3	Moderately Unsatisfactory (MU)
Implementation of some of the seven components is not leading to efficient and effective project implementation and adaptive, with most components requiring remedial action.	
2	Unsatisfactory (U)
Implementation of most of the seven components is not leading to efficient and effective project implementation and adaptive management.	
1	Highly Unsatisfactory (HU)
Implementation of none of the seven components is leading to efficient and effective project implementation and adaptive management.	

Ratings for Sustainability: (one overall rating)	
4	Likely (L)
Negligible risks to sustainability, with key outcomes on track to be achieved by the project's closure and expected to continue into the foreseeable future.	
3	Moderately Likely (ML)
Moderate risks, but expectations that at least some outcomes will be sustained due to the progress towards results on outcomes at the Midterm Review.	
2	Moderately Unlikely (MU)
Significant risk that key outcomes will not carry on after project closure, although some outputs and activities should carry on.	
1	Unlikely (U)
Severe risks that project outcomes as well as key outputs will not be sustained.	

Individual Contract (IC)  
ToR for International Consultant- Pre-Feasibility Study for the Green Climate Fund (GCF)

ToR ANNEX F: MTR Report Clearance Form  
*(to be completed by the Commissioning Unit)*

Midterm Review Report Reviewed and Cleared By:	
Commissioning Unit	
Name: _____	_____
Signature: _____	Date: _____
UNDP/GEF Regional Technical Advisor	
Name: _____	_____
Signature: _____	Date: _____

Individual Contract (IC)  
ToR for International Consultants: Pre-Feasibility Study for the Green Climate Fund (IGF)

**Annex 2: MTR mission itinerary****15 – 20 October, 2017**

Date/Time	Agenda/Activity	Venue
<b>Sunday October 15, 2017</b>		
	International Consultant arrives in Khartoum, Sudan	
<b>Monday, October 16, 2017</b>		
9:00 – 10:00 AM	Meeting with UNDP	UNDP Offices
10:30 – 12:00 AM	Meeting with project staff and RE-MWRE	WEP office
12:00 – 13:00	lunch break	WEP office
13:30 – 14:30	Meeting with Undersecretary, Ministry of Water Resources and Electricity	Undersecretary's Office
<b>Tuesday, October 17, 2017</b>		
9:00 – 10:00	Meeting with Ministry of Finance and National Economy	Development office
10:30 – 11:30	Meeting with the National ERA	Head of ERA Office
11:30 – 12:30	lunch break	WEP office
12:30 -	Leave to Dongola and spend the night there	
<b>Wednesday October 18, 2017</b>		
8:00-9:00	Field visit to Dongola	The Wind Energy site
10:00 – 11:00	Meeting with Minister of Urban Planning	Minister's Office
11:00 – 13:00	Meeting with Electricity Distribution Company	Director's Office
13:00 -	Travel back to Khartoum from Dongola	
<b>Thursday, October 19, 2017</b>		
9:00 – 10:00	Meeting with National Research Center for Energy	Director's Office
10:30 – 11:00	Meeting with Sudan GEF Focal Point	MENRPD, GEF Focal Point Office
11:30 – 12:00	Meeting with HCENR	Secretary General's Office
12:00 – 13:00	lunch break	WEP office
13:00 – 14:00	Debriefing to UNDP senior management	UNDP Office
14:30 – 15:30	Meeting with Ministry of International Cooperation	Director general office
16:00 – 18:00	Meeting with the Project Staff	WEP office
<b>Friday, October 20, 2017</b>		
	International Consultant departs Khartoum, Sudan	

### Annex 3: List of People Interviewed and Institutions Consulted

#### UNDP Offices

Nouralla Yasin Ahmed

E-mail: [nouralla.ahmed@undp.org](mailto:nouralla.ahmed@undp.org)

Hanan Mutwakil

E-mail: [hanan.mutwakil@undp.org](mailto:hanan.mutwakil@undp.org)

Min Htut Yin

E-mail: [min.htut.yin@undp.org](mailto:min.htut.yin@undp.org)

~~Hanan Mutwakil~~ (it is a repetition)

E-mail:

[hanan.mutwakil@undp.org](mailto:hanan.mutwakil@undp.org)

Intisar Ali Salih

#### WEP Office

Hind Elamin Elnour, National Project Manager

Email: [hindrdrd@hotmail.com](mailto:hindrdrd@hotmail.com)

Ahmed Osman Alamin, National Project Engineer

Email: [ahmed.osman@wepd.org](mailto:ahmed.osman@wepd.org)

Khalid Mohammed Ahmed, National Project Engineer

Email: [nk.elabbassy@wepd.org](mailto:nk.elabbassy@wepd.org)

Amira Taha Abdulwahid, Project Finance Assistant

Email:

Mahgoub Eisa Khalil, MWRIE-RE Director General

Email: [mahjoubbeisa@hotmail.com](mailto:mahjoubbeisa@hotmail.com)

Yasir Abdalla Saeid, MWRIE-RE Director

Email: [sudanrenen@gmail.com](mailto:sudanrenen@gmail.com)

#### Ministry of Water Resources and Electricity, Undersecretary's Office

Musa Omer Abuelgasim, Undersecretary

#### Ministry of Finance and National Economy, Development office

Siddig Elobied

Omer Haggam

Gamela Omer Ahmed

Moaiz Alawad Elshikh

Safia Mahmoud Abdelgadir

#### National ERA, Head of ERA Office

Abdlhafiz Fadlalla Babiker

Hanan Mohamed Ahmed

Ibrahim Amin

#### Minister of Urban Planning / Northern state Governor

Yusuf Abdalla, Urban planning, General Manager

Asaad Abdulhadi, Director General

Rifaat Mohamed Alamin, Executive Office manager

Ahmed Osman Suleiman, Northern State Deputy Governor

#### Electricity Distribution Company

Haidar Hasan, Deputy Manager

Ahmed Mansour, Engineer

#### National Research Center for Energy



Sami Sharif, NERC General Manager  
Elfadil Brima Hamid, NERC-Director

E-mail: [smsarif@uofk.edu](mailto:smsarif@uofk.edu)  
E-mail: [elfadil60@hotmail.com](mailto:elfadil60@hotmail.com)

**Sudan GEF Focal Point / HCENR**

Hana Hamadalla, HCENR, Senior Director

E-mail: [hanahamadalla2@yahoo.com](mailto:hanahamadalla2@yahoo.com)

Ministry of International Cooperation

Nuha Mohamed Bashir, UNDP desk officer

Ahmed Elsharief Mohamed, Deputy Director on Int.  
Organizations & Economic Blocs

E-mail: [nonamohammed2005@yahoo.com](mailto:nonamohammed2005@yahoo.com)

E-mail: [elsharif1960@gmail.com](mailto:elsharif1960@gmail.com)



## Annex 4: Example questions or interview guide used for data collection

The following set of outline questions was prepared based on the ToRs and used in part / whole in structured interviews as appropriate / relevant. The project includes four components: (1) the implementation of an initial wind farm; (2) support to policy and regulatory development, particularly to encourage private sector participation; (3) strengthening the support for wind technology in the country; and (4) support an adaptive learning and replication plan.

### 1. Project relevance and consistency with country priorities and the local community needs specifically:

- A. What is the name and role of the organisation/entity that you work for on this project?
- B. So far does this project support removal of barriers to the adoption of utility-scale wind energy tied to the national grid in Sudan and if so how?
- C. Has wind energy now been adopted in Sudan?
- D. How has a systems approach been used to integrate energy policy analysis within the broader developmental objectives of Sudan?
- E. Has the project established regulatory frameworks for encouraging private investments in grid-connected wind energy specifically and renewable energy in general – if yes, how has this been done.
- F. Has support for the implementation of the first wind farm in Sudan, Dongola, aligned the wind farm with international best practices?
- G. Has capacity building to establish the technical and regulatory capacities within Sudan to promote the development of wind farms been supported by this project?
- H. Has any of this project's outcome started focusing on the development of standardised guidelines, feed-in tariffs and procedures for future wind farms?
- I. To support a 'one-stop-shop', has a training programme been enacted to put in place procedures and support for the staff?
- J. In relation to this project how has the strengthening of the wind technology support and delivery system been done?
- K. How has adaptive learning and replication plans been supported?

### 2. Ownership of the project:

- A. at the national and local levels;
- B. stakeholder participation at national and local levels;
- C. partnerships developed through the project.

### 3. Effectiveness:

- A. effectiveness in realising project immediate objectives, planned outcomes and outputs;
- B. the effects of the project on target groups and institutions;

- C. the extent to which these have contributed towards strengthening the institutional, organisational and technical capability of the government in achieving its long-term sustainable development objectives (including environmental management goals).
4. Sustainability of:
- A. project achievements and impacts, including financial and institutional sustainability;
  - B. an assessment of planned replication and exit strategies.
5. Management arrangements
- A. Management arrangements, including supervision, guidance, back-stopping, human resources;
  - B. the Implementing Agency's (UNDP) supervision and backstopping;
  - C. the quality and timeliness of inputs, activities, responsiveness of project management to changes in the project environment and other M&E feedback.
6. Financial planning and sustainability, including the timely delivery and use of committed co-financing.
7. Efficiency or cost-effectiveness in the ways in which project outputs and outcomes were achieved.
8. Adaptive management, including:
- A. effective use of logframe, UNDP risk management system, annual Project Implementation Reviews, and other parts of the M&E system, tools and mechanisms as appropriate;
  - B. evaluate whether project design allowed for flexibility in responding to changes in the project environment.
  - C. review the recommendations of the MTR and assess how the MTR had helped adaptive management of the project.
9. Risk management, including the UNDP risk management system within ATLAS, which is also incorporated in the annual PIR. The evaluators are requested to determine how effectively the risk management system is being used as an adaptive management tool. Risks may be of a financial, socio-political, institutional, operational, environmental (or other) type.
10. Cross-cutting issues:
- Governance: How has the project facilitated the participation of the local communities in adaptation, natural resource management and decision-making processes;
  - Promotion of gender equity: Has the project considered gender sensitivity or equal participation of man and women and boys and girls in decision-making processes;
  - Capacity development of participants and target beneficiaries;
  - Communications and use of technology.
  - Monitoring and reporting.

## **Annex 5: List of documents reviewed and documents consulted**

1. PIF
2. UNDP Initiation Plan
3. UNDP Project Document
4. UNDP Environmental and Social Screening results
5. Project Inception Report
6. All Project Implementation Reports (PIR's)
7. Quarterly progress reports and work plans of the various implementation task teams
8. Audit reports
9. Finalized GEF focal area Tracking Tools at CEO endorsement and midterm Climate Change Mitigation
10. Oversight mission reports
11. All monitoring reports prepared by the project
12. Financial and Administration guidelines used by Project Team
13. Minutes of the Promoting Utility Scale Power Generation from Wind EnergyPSC meetings