The Private Sector Led Development of On-grid Wind Power in Tunisia Project

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Final Evaluation

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ANME

الوكالة الوطنية للتحكم في الطاقة
Agence Nationale pour la Maîtrise de l'Energie
National Agency for Energy Conservation

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List of Acronyms

AfD	Agence Française de Développement
ANME	Agence Nationale pour la Maîtrise de l'Energie
BAU	Business as usual
BMU	German Federal Ministry for the Environment, Nature Conservation, Building & Nuclear Safety
BUR	Biennial Update Report
CAGR	Compound Annual Growth Rate
CCGT	Combined Cycle Gas Turbine
CDM	Clean Development Mechanism
CIPIE	Commission Interdépartementale de la Production Indépendante d'Electricité
CO_2	Carbon dioxide
CoP	Conference of Parties (of the UNFCCC)
CPA	Component Project Activity (of a CDM Programme of Activities)
CSO	Civil Society Organisation
CSP	Concentrated Solar Power
CSPIE	Commission Supérieure de la Production Indépendante d'Electricité
DGE	Directorate General for Energy
DREI	De-Risking Renewable Energy Investment (UNDP methodology)
EE	Energy Efficiency
EIA	Environmental Impact Assessment
ETF	Energy Transition Fund
EU-ETS	European Union Emissions Trading Scheme
FE	Final Evaluation
FiT	Feed-in tariff
FNME	Fonds National de Maîtrise de l'Energie
GCF	Green Climate Fund
GEF	Global Environment Facility
GHG	Greenhouse Gas
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
GoT	Government of Tunisia
IPCC	Intergovernmental Panel on Climate Change
IPP	Independent Power Producer
kWh	Kilowatt-hour
LCOE	Levelised Cost of Electricity
LEDS	Low-Emission Development Strategy
LPA	Logical Problem Analysis
M&E	Monitoring and Evaluation
MoI	Ministry of Industry
MEF	Ministry of Economics and Finance
MELPSD	Ministry of Equipment, Land Planning and Sustainable Development
MENA	Middle East & North Africa
MRP	Market Readiness Proposal (of the Partnership for Market Readiness)
MRV	Monitoring, Reporting and Verification
$MtCO_2$	Million tonnes of carbon dioxide

MTR	Mid-term Review
MWh	Megawatt-hour
NAMA	Nationally Appropriate Mitigation Action
NGO	Non-Governmental Organisation
NMM	New Market Mechanism
PIR	Project Implementation Review
PMR	Partnership for Market Readiness
PoA	Programme of Activities (CDM)
PPA	Power Purchase Agreement
PSC	Project Steering Committee
PV	Photovoltaic
RE	Renewable Energy
RES	Renewable Energy Source
STEG	Societé Tunisienne de l'Electricité et du Gaz
tCO_2	tonnes of carbon dioxide
TND	Tunisian dinars
TPBM	Territorial Performance-Based Mechanism
TSP	Tunisian Solar Plan
UNDESA	United Nations Department of Economic and Social Affairs
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
UNFCCC	United Nations Framework Convention on Climate Change
UTICA	Union Tunisienne de l'Industrie du Commerce et de l'Artisanat
WB	World Bank

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Project Summary

GEF Project ID: 967
UNDP-GEF PIMS ID: 2129
GEF Agency Project ID: 00072552
Country: Republic of Tunisia
Project Title: The Private Sector Led Development of On-grid Wind Power in Tunisian Project
GEF Agency: UNDP
Implementing Partner: National Agency for Energy Conservation, ANME
GEF Operational Program/Strategic Program: The project is fully consistent with the GEF Operational Strategy, including the operational principles and the Operational Program number 6 "Promoting the Adoption of Renewable Energy by Removing Barriers and Reducing Incremental Costs".

Executive Summary

Project Summary

The TWED (Tunisian Wind Energy Development) project was a Global Environment Facility (GEF) funded Full-Sized Project (FSP), with GEF support of US$ 2,000,000 (excluding the GEF Agency fee and the PPG funding), and an originally proposed co-financing of US$ 2,000,000 from ANME for a total budget of US$ 4,000,000. The anticipated duration of the project was 3 years, but it was subsequently granted two extensions that brought the completion of the project to 31 December 2014. A first no-cost extension of 18 months was requested upon completion of the Mid-term review in June 2012. A second request for extension was made in December 2013.

The goal of the project was to reduce Tunisia's overall energy-related CO_2 emissions in a cost-effective way while helping stabilize energy costs through greater diversification of energy sources. The project was expected to also help Tunisian companies acquire core competencies in wind energy equipment and services.

The project objective is planned to be achieved through the following four outcomes:

Outcome 1: Enabling regulatory and institutional framework has been established in support of on-grid renewable energy.
Outcome 2: Technical and organizational capabilities of key stakeholders have been strengthened.
Outcome 3: IPP Group is able to launch private wind concession programme.
Outcome 4: Monitoring and evaluation support provided

Methodology of final evaluation

This final evaluation (FE), which was a planned activity in the project, reviews the actual performance and progress toward results of the project against the planned activities and outputs, based on the standard evaluation criteria: relevance, efficiency, effectiveness, results and sustainability. The evaluation methodology is based on a participatory mixed-methods methodology, including: (i) a desk review of project documentation and related documents; (ii) a questionnaire survey, and (iii) interviews with key project participants and stakeholders. The combination of methodologies has provided an evidence-based approach to carry out this evaluation. The review period covers the start of project implementation (i.e. inception in October 2009) to December 2014, and it includes an assessment of issues prior to approval, such as the project development process, overall design, risk assessment, and monitoring and evaluation planning. The desk review was initiated prior to the in-country mission that took place between 8 and 12 December 2015.

Main findings of FE

Risks posed by the revolution that took place in January 2011 in Tunisia were not foreseen during the project design. After this revolution, a new political context emerged in Tunisia with the emergence of new interest groups such as various lobbies at the level of the National Constituent Assembly that supported the views and opinions of such groups as the STEG

workers' Union and emerging political parties. As already discussed, the vested interests of these groups did not necessarily favor the promotion of private sector participation in the generation of electricity. Although the Renewable Energy Law 2014 has been proclaimed, its operationalization requires the adoption of specific Decrees. Hence, there is still institutional space for these interest groups to continue that resistance to change. The mid-term evaluation had identified a new risk related to the fear among the various stakeholders to discuss and work through their differences in positions and points of view in a systematic way. The evaluation had then recommended the setting up of a PSC that would provide political leadership - rather than just technical validation and quality assurance of project deliverables - to address institutional differences so that the negative events associated with this risk would be avoided. However, there is no evidence that this recommendation was implemented, and the differences continue to prevail thereby hindering the institutional transformations that are needed for catalyzing private sector investments in renewable energies. If this risk had been addressed at an earlier stage by the PSC with the support of ANME, which itself had submitted the draft RE Law to the Ministry of Industry, Energy and Mines, the project could have facilitated the strengthening of partnerships and facilitate more dialogue between the parties to clarify the purpose of the law in a context of increasing energy insecurity, increased trade balance deficit driven partly by the importation of primary energy, the incapacity of the government to support energy subsidies while there are other developmental priorities, and the lack of financial capacity for STEG to invest in adequate power generation infrastructure to meet the development needs of the country.

Based on the evaluative evidence collected during this evaluation, the **overall performance** of the project is rated ***moderately satisfactory***. The project "**Progress Towards Overall Project Achievement and Impact"** is also rated ***moderately satisfactory***. The project faced significant start-up delays due to a lack of institutional coordination, and it has faced a difficult unforeseen situation concerning the revolution that took place in January 2011. Before the revolution the power sector consisted of a monopoly by the national utility STEG that resisted the participation of the private sector in the generation of electricity. After the revolution, special interest groups such as STEG workers' Union and political parties increased the complexity of the situation by further cementing this resistance to private participation in power generation. The project's immediate goal of delivering 2.2 million tonnes of emission reductions has not been reached since the anticipated 60MW of private wind concession did not materialize. As discussed in the evaluation, this target was not realistic given the prevailing monopoly in the power sector and the lack of appropriate policy and regulatory frameworks for facilitating private sector investments in renewable energies in Tunisia.

The programme is considered relevant in the Tunisian context. It has supported the Tunisian Solar Plan that seeks to achieve a total renewable energy penetration target of 30% of the electricity generation mix by 2030. The technologies considered are wind, solar photovoltaic (PV) and concentrated solar power (CSP), with electricity generation contributions from each of 15%, 10% and 5% respectively. With technical support from the TWED (Tunisia Wind Energy Development) project, a Renewable Energy Law was proclaimed in 2014 by the National Constituency Assembly (NCA) This law proposes three ways in which renewable electricity can be produced, and which are supportive of private sector investment in renewable energies in Tunisia:

- Auto-production – applicable to any local government institution or public or private enterprise that is active in the industrial or agricultural sectors. The conditions for the transport of electricity and the sale of any excess production to STEG, including the maximum quantity of renewable electricity that can be sold, will be defined by a subsequent ordinance. The law stipulates that the auto-producer must also be the owner of the renewable power plant/facility. The conditions are similar to those contained in Decree No. 2773.
- Independent power generation for sale entirely and exclusively to STEG – the power generation project will be reviewed by a technical committee, which will make necessary recommendations to the Ministry overseeing the energy sector. Typically, the maximum installed renewable capacity will be specified by ordinance. For projects that exceed the maximum installed capacity, a competitive bidding process will be adopted.
- For export – the project must be of national interest and will be developed through a concession. A technical committee will study the technical and financial viability of the project, and make recommendations to the Ministry overseeing the energy sector. The transmission of the electricity can be made either along a dedicated power line (in which case the promoter will cover all the investment and maintenance costs, and cede the transmission line free of charge to STEG after termination of the contract) or by using the national grid if it has the capacity to do so.

The overall goal of the GEF in climate change mitigation is to support developing countries and economies in transition toward a low-carbon development path. The project was approved under the strategic priorities for GEF-4 (July 2006 – June 2010), but was also aligned with the strategic priorities for GEF-5 (July 2010 – June 2014). Consistent with the GEF Operational Project 5 Focal Area of climate change mitigation, the TWED project supports Strategic Objective 3: "Promoting investment in renewable energy technologies". TWED forms part of Tunisia's contributions to the United Nations Framework Convention on Climate Change (UNFCCC) to stabilize greenhouse gas emissions below dangerous anthropogenic levels.

Based on all aspects of project implementation and financial management, project **efficiency** is rated ***moderately satisfactory***. At the end of 2014, the total project expenses amounted to ~84% of the total GEF funding. Based on Annual Work Plans (AWPs) provided for 2013 and 2014, the planned budgets for 2013 and 2014 were USD 257,445.87 and USD 907,676.79, respectively. The Combined Delivery Reports showed that the actual expenditures were USD 329,336.25 (2013) and USD 517,929.84 (2014). In 2013, actual expenditure exceeded the planned budget by ~30%, whereas it was lower by ~43% in 2014. A similar analysis could not be made for 2012 because of an incomplete AWP. These significant differences reveal shortcomings in annual planning. Further, since no AWP was produced in 2015, it has not been possible to gauge whether or not the remaining 16% of the GEF funding would be absorbed by the project up to March 2015 – i.e. the period for finalizing the FE. Nevertheless, the UNDP has provided Project Resource Overview that shows additional committed expenses to March 2015 amounting to USD 197,880, which will bring final project expenditure to ~94% of total GEF funding. Following delays in implementation in 2009 and 2010 (that were reviewed in the MTR), project expenses picked up with an increase in project deliverables between 2011 and 2014 (except for a plateau in 2013). Twenty six (26%) per cent of total GEF funding was spent in 2014, as opposed to 7.9% in 2010. Independent audits were carried out by KPMG for expenses

accruing between 1 January and 31 December 2011 and 2014. The audit report found that the expenses: (i) were in conformity with the approved project budget; (ii) were related to the project activities, (iii) conformed to the policies, rules and procedures of the government, and (iv) were supported by receipts or other supporting documents. The independent audit carried out in 2014 reveals that the planned budget for 2014 was revised downwards to USD 517,930 so that the actual expenditure was in conformity with the approved project budget. Details about annual budget revisions and their approval by the PSC were not provided during the evaluation.

Coordination of stakeholders has been a strength of the project, especially concerning the delivery of trainings and capacity building on wind power development, and the stakeholder engagements that were carried out during the design, evaluation and approval of the new RE Law 2014. However, there were also shortcomings related to the more direct involvement of the private sector on the PSC, as well as the participation of CSO/NGO and other public institutions. The project concept originated indigenously from ANME, and the project development phase included inputs from relevant national institutions and organizations. The Ministry of Regional Development and Planning (currently named the Ministry of development, investment and international cooperation) was roped in during the second half of the project in order to facilitate the integration of renewable energies and climate change mitigation in development planning. This Ministry benefited predominantly from trainings and capacity building provided by the project.

All evidence gathered during the evaluation mission indicates that UNDP is fulfilling its oversight and supervision responsibilities – except for the issue related to having PSC meetings at a frequency of three per year (and there is no evidence for any PSC meetings in 2014), UNDP has worked with the project team to ensure comprehensive and timely financial and progress reporting. The UNDP has also provided technical input in the development of several terms of references, and in some cases it has recruited technical experts for developing same. The project supervision has also benefited from the in-country presence of UNDP at the country level, and its dedicated Environment and Energy Unit. Financial monitoring and evaluation of the TWED project is carried out using the ATLAS tool of UNDP, which generates reports such as the CDR to gauge the level of delivery on all the outcomes of the project.

An agreement at the beginning of project implementation was that UNDP would provide recruitment services to the ANME up to a rate of 95%. This arose from the recognition of the implementing partner – i.e. ANME – that government procedures were complex and cumbersome. Nevertheless, the UNDP procurement process was experienced by the PMU as being lengthy and at times resulting in delays in project implementation. It would have been productive for the PMU staff to receive training from UNDP during the project to familiarize them with its rules and regulations, as well as on the use of the results framework as a planning and M&E tool. The training that was carried out at the beginning of the project did not reach all the members of the PMU, especially the technical staff. Nevertheless, the training received by the Project Manager could have been replicated during the project lifetime.

Progress made to date has been spread across all the outcomes of the project. Given the circumstances, project **effectiveness** has been rated ***moderately unsatisfactory***, with outputs that are expected to have significant impacts beyond the lifetime of the project being achieved under Outcomes 1, 2, 3 and 4.

Objective: No direct GHG emission reduction has taken place during the lifetime of the project. Cumulative indirect GHG emission reductions have been calculated at between ~3.1-3.8 $MtCO_{2e}$ over a 15-year post-project duration; which is around half of with the value of 7.30 $MtCO_{2e}$ that was expected during the design stage and is stated in the Project Document.

Outcome 1: The project has supported the design and revision of the Renewable Energy Bill that was approved and proclaimed by the National Constituency Assembly in 2014. Outcome 1 has been the most successful component of the project.

Outcome 2: The project has carried out a good job of providing training to its main stakeholders, and it is to be noted that more than 50% of the beneficiaries were from the private sector. However, since no wind power project has materialized, the impact of these trainings has remained weak. Further, the local industry has not developed a value chain for wind technology as was targeted by the project.

Outcome 3: Although the IPP Group has received technical support from the project, it cannot be said that it is able today to launch a private wind concession programme. Concessions models and associated tendering documents are still being finalized. Also, the Decrees that will be needed to operationalize the RE Law 2014, including supporting private power generation through a process of tendering, are yet to be approved. As can be seen from the financial analysis, this output has lagged behind during the entire implementation period and it has produced fewer outputs, especially when compared to Outcome 1.

Outcome 4: The M&E of the project has revealed shortcomings. For instance, the more decisive role of the PSC to provide political guidance and oversight for the project were found to be lacking despite recommendations to redress the situation was proposed in the MTR. The development of AWPs, reporting and adaptive management of the project could have been improved. Also, there were no meetings of the Project Steering Committee in 2014 when the project was expected to deliver significant outputs and at a critical moment when the RE Bill was being finalized for proclamation. As discussed in the lessons learned section, the logical framework of the project having shown design flaws also hindered the better project M&E.

Sustainability

Based on the assessment of four components of sustainability, the activities and impacts of the project beyond its lifetime are assessed to be likely. The ANME is undertaking several initiatives that will ensure the sustainability of the project. Most notably there is the new ANME-UNDP-GEF project "NAMA Support for the Tunisian Solar Plan" that has built on the outcomes discussed in Section 4. This project seeks to deploy a number of policy de-risking instruments to promote the private investments in order to implement the TSP. It has also identified a number of financial de-risking instruments that the Government of Tunisia can put in place to promote private investments in wind and solar PV electricity generation.

After the revolution that took place in January 2011, Tunisia, unlike other middle-eastern States, has witnessed a peaceful transition to democracy between 2011 and 2014. A new government was elected through democratic elections in December 2014. The new

government is widely expected to enhance socio-political stability in the country, albeit with a challenging economic reform that needs to be carried out. Socio-political risks remain but are perceived as being unlikely.

After the revolution in January 2011, a new political context emerged in Tunisia with the emergence of new interest groups such as various lobbies at the level of the National Constituent Assembly that supported the views and opinions of such groups as the STEG workers' Union and emerging political parties. The vested interests of these groups did not necessarily favour the promotion of private sector participation in the generation of electricity. However, this situation cannot persist given the economic situation of the country that is intricately linked to energy insecurity, the pressure related to a balanced budget because of the unsustainability of energy subsidies, and the financial incapacity of STEG to invest in power generation.

There are no risks to environmental sustainability. In fact, an awareness of a changing climate in Tunisia (as exemplified by the incorporation of an article to decisively address climate change and its impacts in the new Constitution) is expected to increase the demand for renewable energies, and hence increasing the opportunities for reducing GHG emissions.

Lessons learned

There are a few key lessons that have been derived from the TWED project and which should be captured as lessons learned.

- Project design: The project was designed to be implemented over a period of 3 years and the actual implementation period was effectively 6 years. Notwithstanding the project extension, the main objective to generate direct emission reductions through 60MW of private sector wind installations was not achieved. The context in which the project was developed was characterized by a situation of quasi-monopoly of power generation, transmission and distribution, and sales of electricity by STEG. To compound the problem, it should be noted that the total lead time for an onshore utility-scale wind installation may exceed 2 years.[1] Further, there was no favorable policy and regulatory frameworks in place to support private investments in renewable energies. Given these conditions, it is observed that the target for achieving 60MW of private sector wind power generation was unrealistic or too ambitious. There was an opportunity to review this target at the half-way mark but that was not carried out. The TWED project has shown that caution much be applied in the design of similar projects where similar contexts as in Tunisia prevail.

  While it was unrealistic to go from a situation of having no wind investments and private sector participation in renewable energy to 60 MW of commissioned wind farms, and all the policy and regulatory work in 3 years, a phased approach to put in place the essential building blocks of wind energy development gradually and in sequence may have been a better alternative. For instance, an alternative project could have focused on wind energy resources mapping, capacity-building of all the key stakeholders, the development of procurement mechanisms, and the facilitation of one demonstration

[1] http://www.windbarriers.eu/fileadmin/WB_docs/documents/WindBarriers_report.pdf - accessed 27 February 2015.

wind farm supported with an Energy Purchase Agreement mechanism. Such a project would then have paved the way for larger wind investments.

Besides being too ambitious, the emission reduction targets were elaborated without sufficient clarity as to how the regulatory work would be sequenced with the wind farm investments. Further, the calculation of direct emission reductions did not follow the appropriate method for a GEF-funded RE project. For instance, there should be no direct GHG emission reductions during the project period. There should be only lifetime direct emission reductions from investments facilitated during the project period. And, there are no post-project direct emissions, since these only apply to projects with financial mechanisms. So the entire emission reduction targets given in the project document were not elaborated correctly and as per the GHG handbook.

- Usefulness of the strategic results framework: Since the results framework is the cornerstone tool that defines the project, and it is also the tool that is used for planning project implementation and for carrying out monitoring and evaluation of the project, the quality of its design will automatically reflect the impacts that the project will yield. This evaluation has shown that there were serious design flaws in the results framework (and the project document) that also capture the over ambitious or unrealistic investment targets and the corresponding direct GHG emission reductions that the GEF-financed project was expected to deliver. There were design flaws in the project document and results framework that have made the evaluation of impacts difficult. Some examples are:

  Several of the indicators are poorly defined and may not be well connected to the targets that the project sought to achieve. Some examples are:

  - Poorly defined indicators: One indicator is the 'issuance of private wind concessions' but there is no formal definition of what would constitute a private wind concession. Another example is the lack of definition of 'private sector wind power investments'. For instance, does wind power investments cover all investments that a private promoter would carry out prior to the capital investments in an actual wind farm and grid interconnection, such as wind energy resources assessments, interconnection studies and micro-siting of wind turbines? Or would 'investments' cover the actual capital investment in wind farm hardware and grid interconnection? These are important because they directly influence the way in which the impact of the project on direct global environmental benefits are calculated. For instance, if a wind project has been authorized by the Ministry of Industry to be installed under the auto-production law, such as the 45 MW wind farm project at the Gabes cement factory, and if that authorisation was considered to be a 'private wind concession', then the project could be counted as delivering direct GHG emission reductions even when installed outside the project lifetime.[2] In this example, it is also not clear

[2] This example is noted in the 2014 PIR. However, discussions with Mr Ghodhbani, Gabes Cement Company carried out in the context of this evaluation have revealed that the chances of implementing the 45 MW wind farm under the auto-production Law are very low. Also, it should be noted that the 45 MW wind energy project at Gabes is also a baseline project in the ANME-UNDP-GEF project entitled 'NAMA Support for the Tunisian Solar Plan'. In order to avoid double counting, the calculations of global environmental benefits in Section 5.4 have not considered the Gabes wind farm project.

whether the 'authorization from the Ministry of Industry' would constitute the 'issuance of private wind concessions'?

- Disconnection between objectives, targets and indicators: The project objective mention incentives will be provided for wind developers, and yet there is no incentive as an indicator or target. The only incentive is arguably the FiT that has been developed under Outcome 3 (output 3.2). Also, the project objective mentions a strategy for issuing tenders and yet there is only mention of concessions (Outcome 3 – output 3.1) and no clarity about the procurement process or interim steps; and
- Tenuous linkages between outcomes, targets and indicators: There are also examples where targets and indicators do not necessarily reflect an outcome. For instance, Outcome 1 seeks to establish an enabling regulatory and institutional framework in support of on-grid renewables. The indicator of this outcome 'strengthened commitment of government to push through a program of private sector on-grid wind power' is rather vague since it does not indicate any objectively verifiable metric to measure 'commitment of government'. Also, 'Government documents on wind energy' is not a target but rather a 'source of verification'.

Similarly for Outcome 3, the indicator 'increased participation by private developers' and the target '60 MW of Wind Power installed by IPP' are not necessarily linked to the *ability* of the IPP Group to launch private wind concessions. Here, the result of launching the private wind concessions may be a 60 MW installed wind energy capacity, but this result says little about the ability of the IPP Group to launch a concession. This is also an example of where the process of launching a private wind concession that follows a sequence of activities is either not well understood or not clearly spelled out. Further scrutiny reveals that the 'increased participation by private developers' may be defined in ways, such as participation in project trainings and receiving the authorization to install 45 MW wind capacity under the auto-production law, other than in the capital investment in 60 MW wind farms.

While the project has been adaptive in reformulating the results framework, it has not fully capitalized on its usefulness as a tool for the proper implementation and monitoring and evaluation of the project. The main lesson learned is the need to also cover the outputs of the project in the results framework.

- Catalytic effect: Given that the project implementation has overlapped with the difficult post-revolution political transition in Tunisia, and given the resistance of STEG to provide political support for the liberalization of the power supply market, the catalytic role of TWED has been partial. Nevertheless, it has built the foundation for private investment in renewable energies to take place, especially through other initiatives like "NAMA Support to the TSP" that is being implemented by the ANME. This shows that Outcomes 1, 2 and 3 are essential elements for the removal of barriers and that the corresponding outputs can be effective policy de-risking instruments to promote private investments in wind energy (and more broadly in Renewable Energy).
- Adaptive management: There is evidence that the project has not been able to adapt to the main challenge it faced, that is resistance from STEG for politically supporting private generation of on-grid electricity from wind power. This has been highlighted by the inability of the project to establish a Strategic Committee as proposed by the MTR in

order to provide political support to the project and to provide a space for discussing institutional differences, especially those resulting in STEG resistance. The lack of an adaptive management approach resulted in the PSC acting effectively as a technical advisory committee to provide quality assurance on the project deliverables. It would have been useful for TWED to develop a strategy to tackle the issue of STEG resistance at the beginning of the project implementation. A sound approach would have been to acknowledge the problem but to see it as an opportunity to develop a strategic partnership with STEG in order to provide a healthy platform to deal with any issues related to this resistance. This would have been especially meaningful given the fact that the resistance from STEG to support private sector involvement in renewable energy generation was not assessed in sufficient depth during project design. Further, there were more openings for the participation of civil society in the political affairs of the country after the revolution that took place early in 2011. During the project design, civil society was not recognized as a key stakeholder of the project. Since local communities are central to the social acceptability of wind energy, the project missed an opportunity for engaging civil society organizations in the aftermath of the revolution in order to promote wind energy. Engagement with the civil society would have been a means to also promote the Renewable Energy Bill and its sensitization in the regions.

Summary of final evaluation

The following table summarizes the mid-term evaluation. The ratings for the project results are based on those indicators of the logical.

Table 1. Final Evaluation Rating Summary.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry	MU	Quality of UNDP Implementation	S
M&E Plan Implementation	MS	Quality of Execution - Executing Agency	S
Overall quality of M&E	MS	Overall quality of Implementation / Execution	S
3. Assessment of Outcomes	**rating**	**4. Sustainability**	**rating**
Relevance	R	Financial resources:	L
Effectiveness	MS	Socio-political:	L
Efficiency	MS	Institutional framework and governance:	L
Overall Project Outcome Rating	MS	Environmental :	L
		Overall likelihood of sustainability:	L

1. Scope of Evaluation and Methodology

1.1 Scope of Evaluation

According to GEF and UNDP evaluation policies, FEs are recommended practice for GEF-funded projects, and a FE was a planned activity of the monitoring and evaluation plan of the wind power project. The UNDP Tunisia office initiated the FE in October 2014, and the TOR for the evaluation is found in **Annex 1**. The objective of this assignment is to undertake an independent review of the project based on guidelines provided by:

(a) GEF Monitoring and Evaluation Policy,[3] and
(b) UNDP-GEF Monitoring and Evaluation Policy.[4]

This FE reviews the actual performance and progress toward results of the project against the planned project activities and outputs, based on the standard evaluation criteria: relevance, efficiency, effectiveness, results and sustainability. The evaluation assesses project results based on expected outcomes and objectives, as well as any unanticipated results.

More specifically, the synthesized objectives of the FE from the GEF and UNDP-GEF M&E policies are:

- To promote accountability and transparency, and to assess and disclose levels of project accomplishment including resource use;
- To provide feedback on issues that are recurrent across the portfolio and need attention, and on improvements regarding previously identified issues; and
- To contribute to the GEF Evaluation Office databases for aggregation, analysis and reporting on the effectiveness of GEF operations in achieving global environmental benefits and on the quality of M&E across the GEF system.
- To monitor and evaluate results and impacts;
- To provide a basis for decision making on necessary amendments and improvements; and
- To document, provide feedback on, and disseminate lessons learned. A mix of tools is used to ensure effective project M&E. These might be applied continuously throughout the lifetime of the project – e.g. periodic monitoring of indicators -, or as specific time-bound exercises such as final reviews, audit reports and independent evaluations. Lessons learned may help improve the selection, design, and implementation of future GEF activities.

1.2 Methodology

In order to complete the assignment, a combination of (i) desk review, (ii) survey using a tailor-designed questionnaire, and (iii) in-person consultations has been used, as discussed below. The combination of mixed approaches favoured a more effective evaluation. The proposed approach was to carry out the questionnaire survey prior to in-country consultations, which would have allowed any queries of respondents to be answered during face-to-face meetings.

[3] http://thegef.org/MonitoringandEvaluation/MEPoliciesProcedures/mepoliciesprocedures.html.
[4] http://www.undp.org/gef/05/monitoring/policies.html.

1.2.1 Desk review

A desk review of the following documents that were provided by the PMU was undertaken:

- Approved Project Document
- Inception Report
- Mid-term Evaluation Report
- Revised Results Framework (and accompanying justifications)
- Annual Work Plans (2010, 2011, 2012, 2013, 2014)
- Project Implementation Reviews (PIRs up to and including October 2014)
- Combined Delivery Reports (CDRs for 2010, 2011, 2012, 2013 and up to December 2014)
- Minutes of Project Board Meetings
- Reports and other deliverables of the project

1.2.2 Survey

The survey was carried out by applying a questionnaire that is found in **Annex 2**. The questionnaire was designed based on prior experience with the evaluation of UNDP/GEF-funded projects, and it covers the objectives of the FE (see Section 1.1). It is also an adaptation of the Evaluation Questionnaire proposed in the Terms of Reference for the final evaluation. The French version of the questionnaire was sent electronically to the project stakeholders by the Project Manager. The stakeholders who were contacted include: the national Agency for Energy Conservation (ANME), UNDP, Tunisian Company for Electricity and Gas (STEG), STEG Renewable Energies, the Independent Power Producer Group Unit, General Directorate for Energy, GEF Focal Point, national climate change Focal Point, Enerciel (private sector) and Gabes Cement (private sector). The PMU was also asked to complete the survey.

The responses of the stakeholders are found in **Annex 3**. The results are the synthesis of both the written and oral responses. All the stakeholders responded to the questionnaire.

1.2.3 Consultations

Face-to-face meetings were carried out with all the stakeholders identified in Section 1.2.2. During these meetings, the answers of the stakeholders to the questions in the questionnaire (**Annex 2**) were noted. The agenda of the in-country mission was organized by the PMU with input from UNDP, and the selection of stakeholders was based on their experience with the project. The agenda for in-country stakeholder consultations is given in **Annex 4**.

1.2.4 Time Schedule for the FE

The time schedule (see **Table 2**) for completing the assignment followed the timeline identified in the Inception Report that was developed by the consultant prior to starting the assignment. The schedule for completing the evaluation was slightly delayed because (1) the consultant requested a contract extension to the end of February 2015 due to the unforeseen circumstances surrounding the ill-health of his father, and (2) some outstanding documents were made available by the PMU in the week of 9 to 13 February 2015.

Table 2. Timeline for completing the FE.

Activity	Timeline

1. Questionnaire sent to stakeholders by PMU	20 November 2014
2. Desk Review	November 2014
3. In-country stakeholder meetings	8 to 12 December 2015
4. Draft final report submitted	25 February 2015
5. Final report (incorporates feedback from stakeholders)	March 2015

1.3 Structure of the Report

The FE report is logically structured to meet the requirements of the evaluation. A brief description of the structure and sections of the report is as follows:

- **Executive summary** – This provides a concise rationale for the FE and it summarizes the main findings and recommendations;

- **Section 1** provides a detailed analysis of the scope of the evaluation and describes the methodology that has been applied to evaluate the GEF-funded project;

- **Section 2** discusses components, outcomes and outputs of the project in the development context of Tunisia. The project fits into a context where power supply is generated from imported fossil fuels and where capacity investments are driven predominantly by the state that already subsidizes power generation, and private investment in renewable energies, and in particular wind power, is seen as a way to ensure energy security, address energy-bill related trade deficits and curtail the increasing burden of subsidies on the state budget. The key stakeholders of the project are also identified.

- The design and implementation of the project is discussed in **Section 3**. In particular, the relevance of the project in relation to national, regional and global benefits is discussed, together with the effectiveness in project management. This section also provides an analysis of the financial management of the project to determine its cost effectiveness and efficiency relative to project outcomes. The effectiveness of the GEF Agency is also assessed in this section.

- **Section 4** provides an assessment of the outputs achieved by the project. The assessment is based on the expected results and indicators as per the project Strategic Results Framework. It also covers an assessment of the recommendations of the MTE.

- In **Section 5**, the sustainability of the project beyond the lifetime of the project is gauged based on various dimensions of risks. Also, the adequacy of the monitoring and evaluation of the project is evaluated.

- The main lessons learned and recommendations for improving other projects are discussed in **Section 6**. This section also gives the final ratings of the FE.

2. Project Overview and Development Context

The project overview summarizes the start and duration of the project, while the development context sets the background against which it was developed, as well as explaining the problems that the project sought to address. This section forms the reference against which the evaluation has taken place.

2.1 Project Start and Duration

The anticipated duration of the project was 3 years, but it was subsequently granted two extensions that brought the completion of the project to 31 December 2014. A first no-cost extension of 18 months was requested upon completion of the Mid-term Evaluation (MTE) in June 2012. A second request for extension was made in December 2013. The dates for key milestones are shown in **Table 3**.

Table 3. Timing of key Project milestones.

Milestone	Expected Date	Actual date
CEO endorsement/approval		15 August 2007
GEF Agency approval date		7 May 2009
Implementation start		8 October 2009[5]
Mid-term evaluation	March 2011[6]	June 2012
Project completion	31 May 2012	31 December 2014
Terminal evaluation completion	June 2012 (initially) November 2013 (after 1st extension) September 2014 (after 2nd extension)	27 February 2015
Project closing	December 2013	April 2015

2.2 Development Context

2.2.1 Problems Addressed

At the time of project design, Tunisia was under the dual pressures of economic development and rapid urbanization that culminated in a 6.2% annual increase in electricity consumption.[7] By increasing power supply mainly through the use of fossil fuels (mainly natural gas), this growing electricity demand had a negative impact on Tunisia's energy balance. Tunisia that was a net energy exported in the early 1980s had become a net energy importer. Given the unsustainability of this situation, the government of Tunisia committed itself to promoting wind energy to take advantage of the country's indigenous renewable resources. This commitment continues today through government's commitment to implement the Tunisian Solar Plan (TSP).[8]

To meet the government's wind development objectives, the then MIEPME sought to open the wind sector to IPPs, following a similar model that had been used for thermal

[5] This is taken to be the date of the Inception Workshop.
[6] This is taken to be 18 months after the implementation start date.
[7] UNDP Project Document. (2009). *The Private Sector Led Development of On-grid Wind Power in Tunisia.*
[8] ANME (2012), *Revised Version of the Tunisian Solar Plan Vol. 2 – Scheduling, Conditions and Means of Implementation*.

generation. There was the recognition that private sector expertise, financing and enterprise were needed to fully develop Tunisia's wind energy resources that had conservatively been estimated at 1,000 MW. The rapid rise in oil and gas prices also played in favour of power generation from wind.

2.2.1.1 Primary energy consumption

Although Tunisia is an oil and gas producer, it became a net importer of fossil fuels after 2000. Primary energy consumption more than doubled, from 4.5 Mtoe in 1990 to 8.5 Mtoe in 2012. In contrast, the production of hydrocarbons stabilised at around 7 Mtoe per annum over this same period. The rising trend in energy demand and the fixed supply of local energy resources resulted in energy deficits of 1.62 Mtoe in 2012 and 1.97 Mtoe in 2013.[9] The ratio of national primary energy production to consumption fell from 120% to 80% between 1990 and 2012. **Figure 1** shows the change in the balance of primary energy consumption from a surplus (local production exceeding consumption) before 2000 to a deficit (consumption met through imports) thereafter.

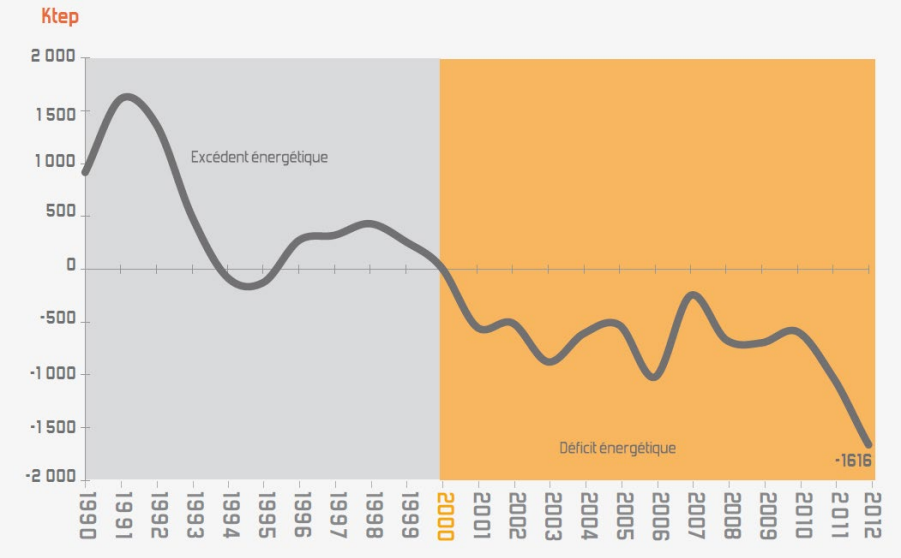

Figure 1. Primary energy balance in Tunisia, 1990-2012 (Source: ANME, Maîtrise de l'Energie en Tunisie, Chiffres Clés, 5eme Edition, June 2013).

Natural gas and oil products provide 98% of primary energy consumption, whereas renewable energies (excluding biomass) currently contribute less than 2% of energy needs. The national production of natural gas covers only 53% of total primary energy consumption, and imported Algerian gas supplies the remaining 47%. Of the total natural gas consumption, 73% is allocated to power generation and 27% goes to the industry and building sectors.[10]

The increasing dependence on imported fossil fuels places a substantial financial burden on the national economy, and this is further exacerbated by energy subsidies provided by the State. In 2012, the total energy bill was approximately TD 6.4 billion (or €2.87 billion)[11],

[9] Quoted in Project Document entitled "Support to energy transition and to the implementation of a low-carbon development strategy (SET-LCD) in Tunisia by 2020 and 2030" (UNDP, Tunis November 2013), pg. 8.
[10] Ibid., pg. 9.
[11] 1 TD = 0.449 €.

equivalent to 16.8% of total imports. In the same year, direct subsidies on energy reached 21% of the Government budget, contributing to a record Government deficit equivalent to 8.3% of GDP.[12]

A recent study by the World Bank has made the case for comprehensive energy subsidy reform while consolidating a targeted safety net for vulnerable households and providing temporary support to key economic sectors.[13] The World Bank reports that 51% of all energy subsidies in 2013 were allocated to electricity generation. Regarding the consumption of electricity, the lowest income-earning households (the lowest quintile) benefited from 13% of the total subsidies whereas the highest income-earning households (the highest quintile) benefited from 29% of subsidies.

The Government of Tunisia has taken steps to remove and reduce energy subsidies. For instance, cost-reflective electricity tariffs were introduced in 2014 for energy-intensive industries such as the cement sector.[14] Similar electricity subsidy reforms will be extended to other sectors over the next 3 to 6 years.

2.2.1.2 Electricity production and demand

Tunisia has achieved almost universal access to electricity (>99.5%). The generation and consumption of electricity are shown in **Figure 2** and **Figure 3**, respectively. **Figure 2** shows that 75% of all electricity was generated by the state utility (Societé Tunisienne de l'Electricité et du Gaz, STEG) in 2011. This had increased to 81.7% by 2013.[15] The generation of electricity is dominated by the use of fossil fuels, and RES constituted only ~3% and ~6% of total installed generation capacity in 2011 and 2012, respectively.[16] At the end of 2012, the installed capacity of RES was estimated at 250 MW while total installed capacity was 4,117 MW.[17]

In 2012, electricity represented 20% of total energy demand, and the annual growth rate of electricity demand has been ~4% over the past decade (**Figure 3**). In order to reduce its energy vulnerability, Tunisia is embarking on an energy transition plan, in which the Tunisian Solar Plan (TSP) plays a central role.[18] To date, Tunisia has a total installed utility-scale wind capacity of 175.12 MW (Sidi Daoud I = 19.3 MW; Sidi Daoud II = 35.7 MW; Bizerte I = 120.12 MW).[19] All the projects have been implemented by STEG.

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[12] http://www.tradingeconomics.com/tunisia/government-budget - accessed 30 May 2014.

[13] World Bank (2013), *Vers une Meilleure Equité: les Subventions Energétiques, le Ciblage et la Protection Sociale en Tunisie*, rapport n. 82712-TN.

[14] Government of Tunisia (2014), *Tunisia: Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding*, http://www.imf.org/External/NP/LOI/2014/TUN/041014.pdf - accessed 29 June 2014.

[15] In 2013, national production was 17,064 GWh, of which STEG generated 13,947 GWh. http://www.steg.com.tn/fr/institutionnel/electricite_chiffres.html - accessed 26 May 2014.

[16] Benedetti *et al*. (2013). *Tunisia Energy Country Report: Focus on Electricity Sector and Renewable Energy Policies*, GSE: Rome.

[17] Perspectives Climate Change (2014), *Analyse des Possibilités NAMA dans le Secteur d'électricité Renouvelable,* pg. 10.

[18] ANME-GIZ (2012), *Draft National Energy Mix Strategy for the Generation of Electricity to 2020 and 2030*.

[19] Data collected to calculate the grid emission factor of the Tunisian electricity system during the development of the UNDP-GEF project entitled "NAMA Support for the Tunisian Solar Plan" – July 2014.

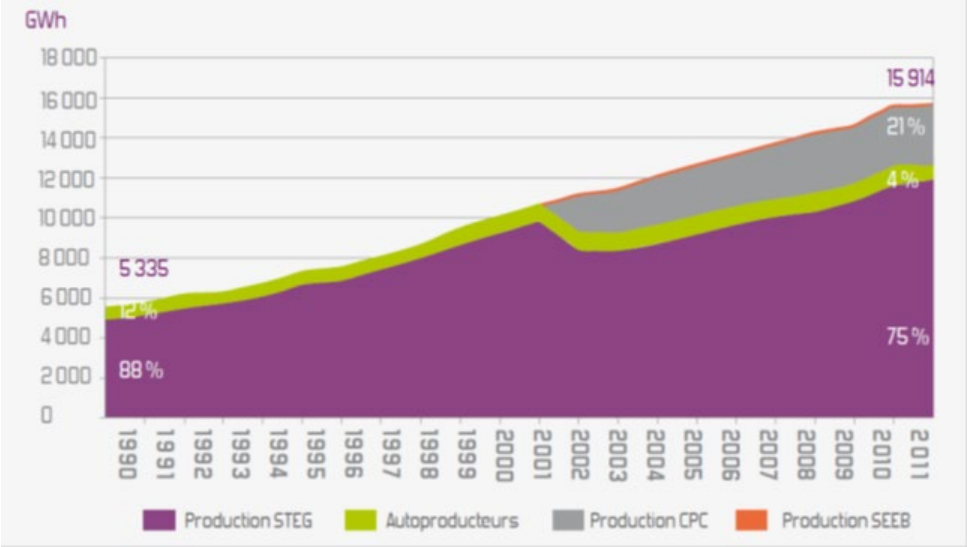

Figure 2. Electricity generation in Tunisia, 1990 – 2011 (Source: ANME, 2013).

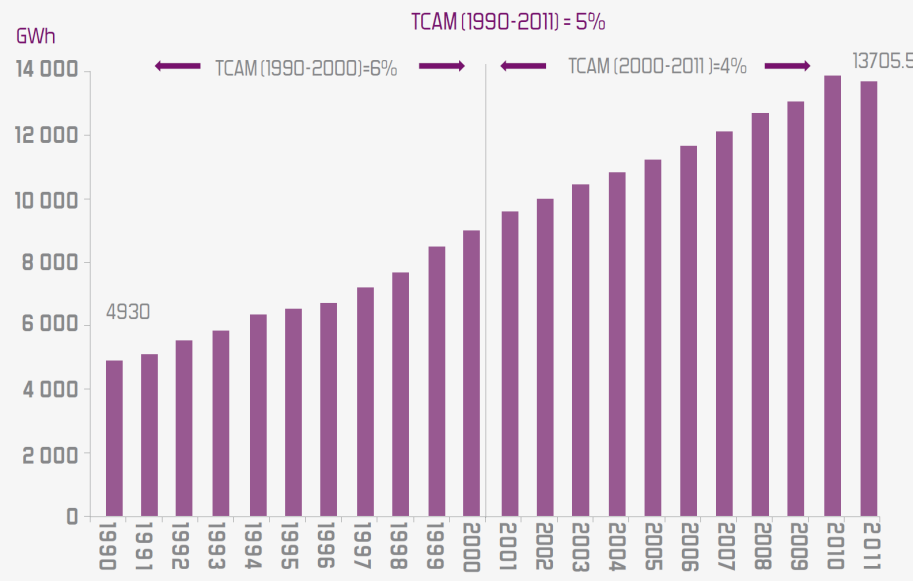

Figure 3. Electricity consumption in Tunisia, 1990 – 2011 (Source: ANME, 2013).

2.2.1.3 Tunisian Solar Plan

The Tunisian Solar Plan (TSP), originally formulated in 2009, was revised in 2012 with the financial support of the Agence Française de Développement (AfD)[20] to achieve a total renewable energy penetration target of 30% of the electricity generation mix by 2030. The technologies considered are wind, solar photovoltaic (PV) and concentrated solar power (CSP), with electricity generation contributions from each of 15%, 10% and 5% respectively.[21] The TSP targets are based on an electricity demand baseline that includes the voluntary adoption of energy efficiency measures over the period 2013-2020 that result in an average reduction in the demand for electricity of 1.4% per year compared to a

[20] ANME (2012), *Revised Version of the Tunisian Solar Plan Vol. 2 – Scheduling, Conditions and Means of Implementation*.
[21] Ibid.

business-as-usual (BAU) scenario of no energy efficiency measures. In the BAU scenario, renewable electricity generation would be only 5% by 2030, and it would come primarily from wind energy. The TSP renewable electricity targets have been framed against this demanding 'energy efficient' baseline, rather than the BAU scenario, for a number of reasons, including: (1) the potential of renewable energy resources; (2) the technical and commercial maturity of renewable technologies; and (3) projected reductions in the costs of these technologies.[22] The installed capacity and expected electricity generation arising from the TSP are shown in **Table 4**.

Table 4. Renewable electricity generation and installed capacity in the TSP, 2016-2030 (Source: ANME, 2013).

	2016	2020	2030
'Energy efficiency' baseline (GWh)	14,549	16,938	26,659
Renewable electricity (GWh)	1,309.4 (9%)	3,387.6 (20%)	7,997.7 (30%)
Installed RE capacity (MW)	684 (12%)	1,703 (24%)	3,725 (34%)

The breakdown in the installed RE capacity between wind, PV and CSP is shown in **Figure 4**. The TSP allows for biomass-derived electricity as a substitute for CSP. The maximum biomass-generated electricity generation capacity is given as 40 MW by 2016, 150 MW by 2020 and 300 MW by 2030.[23] According to the TSP, CSP is expected to be implemented from 2020 onwards.

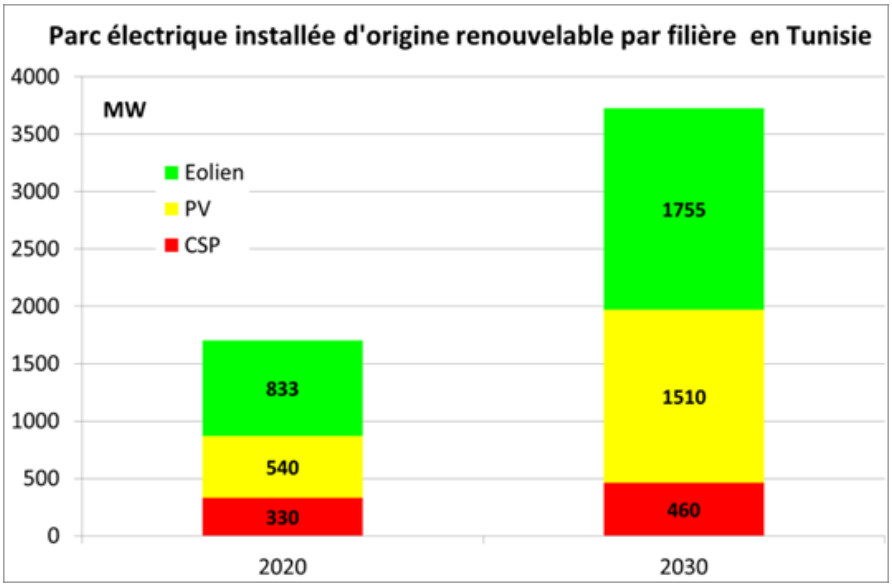

Figure 4. Installed capacity of wind, PV and CSP in the TSP: 2020 & 2030 (Source: ANME, 2013).

The implementation of the TSP will require significant levels of investment, estimated in the TSP at €6,040 million on a cumulative basis between 2013 and 2030.[24] The principal

[22] ANME (2013), *Stratégie Nationale du Mix Energétique pour la Production Electrique aux Horizons 2020 et 2030: Choix, Impacts et Conditions d'Opérationnalisation*, Ministère de l'Industrie, Tunis.
[23] Ibid., pg. 16.
[24] The investments are measured in 2012 €, and are equivalent to € 3,186 million in present (2012) value using a discount rate of 8%.

sources of funding to implement the TSP have been identified as: (1) Government funding; (2) concessional loans from international development agencies; (3) national and international financial institutions; and (4) private-sector investment. Because these levels of investment are beyond the capacity of public finances, especially when considering competing public needs (e.g. poverty reduction, infrastructure development, health, etc.), the TSP places emphasis on catalysing private-sector investments through a combination of: (i) feed-in-tariffs (FiTs); (ii) private concessions through transparent competitive bidding processes; and (iii) public-private partnerships. The approach to leverage significant private sector finance to implement the TSP serves to contextualise the importance of the UNDP-GEF project under review and the precursor role it has played to creating a more private-sector friendly environment in Tunisia. The contributions that the project has made towards creating an environment conducive for a more prominent involvement of the private sector in the RE landscape[25] in Tunisia are discussed in Section 4.

The TSP will bring economic, social and environmental benefits to Tunisia. The cumulative benefits that can be expected between 2013 and 2030 can be summarised as follows:[26]

- 11.7 Mtoe avoided in primary energy consumption;
- 32.5 $MtCO_2$ avoided;
- Savings of €8.7 billion in energy bills;
- Savings of €5.5 billion in subsidies;
- Creation of 10,000 green jobs.

After accounting for EE measures, total cumulative emission reductions of the order of 53 $MtCO_2$ are expected between 2013 and 2030.[27] The TSP is also intended to catalyse green investment that will contribute to economic growth, the creation of green jobs and technology transfer.

2.2.1.4 Emissions from the energy sector

Since the main objective of the UNDP-GEF project is to support the stabilisation of the climate system through the reduction of GHGs, this section provides a cursory look at the national GHG inventory.[28] The energy sector is by far the largest source of GHG emissions in Tunisia, accounting for 84% of the country's total GHG emissions (32.3566 $MtCO_2e$ in 2010).[29] In turn, combustion activities represent 91% of all the emissions in the energy sector. The sectoral breakdown of GHG emissions is shown in **Table 5**. The emissions from the energy industries (i.e. power generation) are the highest and represent 33.0% of all energy sector emissions and 36.3% of combustion-related GHG emissions.

[25] While the focus on the project has been on wind power development, its impacts will also flow to RES in general.
[26] ANME (2013), *Stratégie Nationale du Mix Energétique pour la Production Electrique aux Horizons 2020 et 2030: Choix, Impacts et Conditions d'Opérationnalisation*, Ministère de l'Industrie, Tunis. pp. 22-27.
[27] Ibid. p. 22.
[28] Republic of Tunisia, (2014), *First Biennial Update Report of Tunisia*, Ministry of Equipment, Land Planning and Sustainable Development, Tunis.
[29] Ibid. pp. 20-21.

Table 5. Breakdown of the energy sector GHG emissions, 2010 (Source: FBUR, pp. 20-21 and 26)

Energy sub-sector	Emissions ($MtCO_2e$)	(%)
Energy industries	8.9175	33.0
Manufacturing, mining & construction	4.7937	17.7
Transport	6.9816	25.8
Tertiary	0.6679	2.5
Residential	2.0158	7.5
Agriculture, fisheries & forests	1.1846	4.4
Sub-total combustion	***24.5611***	***90.9***
Sub-total fugitive emissions	***2.4689***	***9.1***
Total emissions energy sector	**27.0300**	**100.0**

2.2.2 Immediate and Development Objectives of the Project

The ANME-UNDP-GEF project aimed at promoting on-grid wind power in Tunisia through the introduction of the necessary regulatory and institutional framework to create favourable conditions for private sector investors in the renewable energy sector. A secondary objective was to assist the government of Tunisia in launching a programme of private wind concessions totalling 100 MW.

2.3.1 Overall goal of Project

The goal of the project is to reduce Tunisia's overall energy-related CO_2 emissions in a cost-effective way while helping stabilize energy costs through greater diversification of energy sources. The project will also help Tunisian companies acquire core competencies in wind energy equipment and services.

2.3.2 Specific objective of Project

The specific objective of the project is to remove the barriers to private sector investment in wind energy in Tunisia. The barriers that the project sought to overcome are listed in **Table 6**. The relationships with the outputs (see Section 2.2.4.2) of the project are listed in the right column.

Table 6: Barriers that the project sought to address.

Barriers	Output in SRF (Annex 5)
Regulatory barriers - No regulatory framework governing on-grid renewable	1.1
Institutional barriers - ANME lacking technical depth to fully play a role of facilitator in the field of renewable energy - No arbitration mechanism between operators	1.2; 2.1
Technical barriers	2.2; 2.2; 3.1

- Limited wind expertise on the ANME - Limited expertise of wind power grid integration issues by STEG - Limited expertise of IPP Group with wind concessions - Limited ability to supply equipment and services to wind operator	
Informational barriers - Tunisian companies not able to participate in wind energy market	2.3
Financial barriers - Absence of a sound and specific economic & policy framework for stimulating investment on on-grid renewable energy	3.2

2.2.3 Main Stakeholders

The project was implemented using a multi-stakeholder approach. The cohort of national stakeholders that were identified during the development of the project, and their roles and functions, are summarized in **Table 7**. On the other hand, and as discussed in Section 3, it will be shown that having the right institutional stakeholders is not necessarily sufficient for the productive (i.e. effective and efficient) implementation of a project. Having the right or appropriate institutional representatives is equally important. This is especially important when it comes to making decisions to steer the project to effective end, and also to use institutional leverage to support the implementation of the project. Stakeholders are listed below based on their proximity to the project – i.e. on the basis of their level of involvement in project implementation.

Table 7. Stakeholders of the project and their roles and functions.

Stakeholder	Roles and functions
Directorate General of Energy (DGE), Ministry of Industry, Energy, and Mines (MoIEM)[30]	The DGE is the arm that is responsible for implementing the energy policy and strategy of the ministry. It is also responsible for planning power generation, including power infrastructure and power plants. Hence, the DGE is directly responsible for overseeing the implementation of the Tunisian Solar Plan (TSP) in coordination with other stakeholders. In these functions, the DGE has an important role to support the setting up of a policy and regulatory framework that can enable private sector renewable energy investments in Tunisia. The DGE also coordinated the drafting and revisions leading to the proclamation of the RE Law 2014.
IPP Group, MoIEM	The IPP Group is responsible for managing the IPP tendering process within the MoIEM, and submitting its recommendations to the Inter-departmental Commission for Independent Power Production (CIPIE). Given this role, the IPP Group is a direct beneficiary of the project

[30] At the time of project design, the ministry was known as the Ministry of Industry, Energy and Small and Medium Enterprises.

Stakeholder	Roles and functions
	technical assistance under Outcome 3: IPP Group is equipped to launch private wind concession program.
Société Tunisienne de l'Électricité et du Gaz (STEG)	STEG has a quasi-monopoly in Tunisia on the generation, transmission and distribution of electricity. By virtue of this position, STEG is arguably the key stakeholder in the Tunisian power sector. Also, to date, all wind power projects have been implemented by STEG (Section 2.2.1.2). Also, STEG is expected to play a key role in the design and operationalization of an Independent Energy Regulator (IEP) in Tunisia. The setting up of the IEP is the outcome of Output 1.1 that sought to set up an arbitration mechanism for the power sector in order to provide a level playing field for new entrants. STEG has been a direct beneficiary of the project under Output 2.2 to enhance its technical capacity for integrating wind energy that has intermittent characteristics into the national grid.
National Energy Management Agency (ANME)	The ANME is responsible for the promotion of energy conservation in Tunisia, through energy efficiency and renewable energy. Hence, its role is to promote wind power in Tunisia. Its mandate covers:; (i) the implementation of a RE/EE program, including the TSP; (ii) designing and implementation of institutional. Regulatory and financial mechanisms for promotional activities, and (iii) the implementation of targeted demonstration projects. ANME[31] has coordinated stakeholder consultations during preparation of the project. During the implementation phase, ANME was the Executing Agency, and it has hosted the Project Management Unit (PMU) and it has chaired the Project Steering Committee (PSC). It has benefited from the project in a multitude of ways, including: (i) technical assistance under Output 1.1 to create an enabling regulatory framework; (ii) capacity building under Output 2.1 to create industry guidelines for wind energy concessions and to develop an updated wind atlas, and (iii) technical support under Outcome 4 regarding project management (e.g. M&E) The ANME is also undertaking several initiatives that will ensure the sustainability of the project. Most notably there is the new ANME-UNDP-GEF project "NAMA Support for the Tunisian Solar Plan" that has built on the

[31] It was formerly known as the National Renewable Energy Agency.

Stakeholder	Roles and functions
	outcomes discussed in Section 4. The role of ANME in ensuring the sustainability of the project is discussed in Section 5.1.
Private wind developers	The proximate objective of the project was to remove barriers that hamper private investment in wind energy in Tunisia. This objective puts the private sector as a main beneficiary of the project. Discussions with private sector operators such as Enerciel Ltd and Gabes Cement Company (Mr Ghodbani) showed that their personnel has benefited from technical capacity building such as the use of modeling software like WASP and WindPRO, and financial modeling of a wind power project, that was provided by the project (see **Annex 3**). Valorem is another company that has received technical support with the feasibility (site selection and wind resources assessment) of a 60MW wind farm at Thala/Kasserine. However, the main frustration of the private sector operators remains the absence of private sector wind installations in Tunisia. The notable absence of private sector representation on the PSC is a weakness that is discussed in Section 3.3.5.
Industrial groups	This group of was targeted by the project because of its high energy consumption. In particular, the cement industry was targeted by the project, especially concerning the ability of cement companies to produce their own electricity from renewable energy under the auto-production Law No. 7 of 9 February 2009, and operationalized through Decree No. 2773 of 28 September 2009. For instance, the project supported the Gabes Cement Company to carry out auto-production. It received the Ministry's authorisation to install a 45 MW wind farm, and is now studying grid connections and micro-siting. However, several technical and regulatory issues concerning the interpretation and application of Decree No. 2773 have hampered the commissioning of the wind farm. A significant problem that has been voiced by potential auto-producers is the inability to set up a Special Purpose Vehicle (SPV) for building, operating and maintaining the wind installation. Under the law, only STEG is allowed to sell electricity. This condition is seen to be breached in the case of a SPV having a contractual agreement with a high-electricity consuming company for the sale of electricity for internal consumption. The private sector sees this interpretation as a sign of STEG

Stakeholder	Roles and functions
	resisting the involvement of the private sector in the generation of renewable electricity. There are other issues related to the lack of transparency concerning the absorption capacity of renewable energy of intermittent source by the grid; lack of standardized Energy/Power Purchase Agreement (EPA or PPA); and the lack of clarity concerning the grid code for interconnecting wind power to the national grid. There is renewed hope that the new RE Law and its forthcoming decrees may be able to overcome some of these issues.
Local industries	Local industries were expected to be direct beneficiaries of the project under Output 2.3 that sought to improve their ability to supply equipment and services to wind operators. During project design, it was observed that Tunisia had a local industry with the capacity to supply various wind technology components, including towers, electrical wiring, civil works and site development. A feasibility study has studied the creation of local job under three scenarios which are discussed in Section 4.1.3. Despite the large potential for a local value chain creation, the local integration of local industries remains non-existent for all practical purposes since no private sector projects have materialized. Although the study has identified 120 companies that have the capacity to support wind farm development in Tunisia, none of them has received direct technical assistance from the project, and nor was any of these companies represented on the PSC.
Tunisian and international banks	Financial institutions were expected to be involved in the financial of the various private wind IPP projects as well as those of the auto producers. While potential auto producers and potential wind farm developers have engaged directly with financial institutions, these institutions do not benefit directly from the project.

It is important to note that, collectively, the key stakeholders had the technical capacity to implement the project. In fact, the MTR showed that the PSC acted more as a technical committee that provided quality assurance on project deliverables rather than providing the political support to the project (Section 3.4).

The results captured in **Table 7** show that the main shortcoming concerning stakeholders has been the lack of proximity of the private sector to the project, especially concerning its involvement in the PSC. Other stakeholders that are missing in **Table 7** are civil society organizations and some line ministries.

2.2.4 Components, Outcomes and Results Expected

The expected outcomes and results for the project as shown in the logical framework given in **Annex 5**. The logical framework shows the objectively verifiable targets and indicators against which performance can be measured and progress reported as done in Section 4.1. The components, outcomes and results are summarized below. The MTR proposed additional activities to be carried out and these were endorsed by the PSC. The updated list of activities is given in **Annex 6**, and together with original targets shown in **Annex 5**, form the basis for performance analysis in Section 4.1.

2.2.4.1 Components of Project

In order to achieve those objectives, the project strategic framework in the original project document outlined that four outcomes would be achieved:

1. Establishing a regulatory and institutional framework that is conducive to on-grid renewables, including power sector arbitration mechanism;
2. Strengthening the technical and organizational capabilities of key stakeholders, including ANME, STEG and local Tunisian companies;
3. Providing technical assistance to the IPP Bureau in evaluating concession models and developing a tariff settlement mechanism; and
4. Providing project monitoring and evaluation support.

2.2.4.2 Outcomes and Results of Project

Through execution of activities under the above components, four key outcomes and related results are expected:

Outcome 1 - Enabling regulatory and institutional framework has been established in support of on-grid renewable energy.

Output 1.1: Regulatory framework has been established for private wind concessions; and

Output 1.2: Proposal for power sector arbitration mechanism is developed.

Outcome 2 - Technical and organizational capabilities of key stakeholders have been strengthened.

Output 2.1: Technical assistance and capacity building provided to ANME

Output 2.2: STEG ability to integrate independent wind electricity production in its grid is strengthened; and

Output 2.3: The ability of local industry to provide goods and services to wind operators has been improved.

Outcome 3 – IPP Group is able to launch private wind concession programe.

Output 3.1: Concession models for private wind power evaluated and contractual documents prepared for one or more models; and

Output 3.2: Tariff mechanism developed and tariff proposed.

Outcome 4 – Monitoring and evaluation support provided.

Output 4.1: Project monitoring and evaluation have been conducted; and

Output 4.2: Technical program assistance has been provided to MIEPME and ANME.

2.2.5 Key Elements of Project Planning

The project document is comprehensive, and includes all of the required components, such as stakeholder analysis and participation plan, baseline analysis, assessment of risks and assumptions, monitoring and evaluation plan, sustainability and replicability analysis, replication plan, and project management arrangements. The answers given by interviewees support these observations (see **Annex 3**). The shortcomings and strengths in the key elements of project planning will be discussed further in Section 3, 4 and 5.

3. Project Design and Implementation

3.1 Project Outcomes

The outcomes of the TWED project mentioned in Section 2.2.4 seek to address country-specific barriers for the implementation of private sector wind energy project, while also creating a wind technology value chain.

3.2 Project Implementation Approach

The TWED project is executed by the Government, through the ANME (i.e. the national implementing partner), under the UNDP National Implementation Modality (NIM). Experience has shown that NIM provides the best opportunity for project support to government priorities and to ensure national ownership. As discussed in Section 2.2.3, several national institutions have benefitted from project implementation. Since the national implementing partner had assessed that the national procedures for recruitments were complex, it had made a request to the UNDP for support to NIM up to 95%. This implies that ANME was virtually not involved in recruitments during project implementation. So, a full NIM approach was not the best strategy for this project because of the cumbersome procurement procedures used by the government.

The PMU carries out the day-to-day running of the project, and it was hosted within ANME. TWED was implemented under the direct oversight of the Director General of the ANME, who was also the Project Director. It had a dedicated full-time Project Manager (PM, Mr Nafaa Baccari), who was not on the project payroll. The PM is a staff of the ANME and holds the position of Deputy Director, Renewable Energy Directorate. The project also benefitted from the technical expertise of three engineers (Mr Mohamed Maghrebi, Energy Engineer, Mr Khaled Bedoui, Electrical Engineer, and Ms Amira Klibi, Industrial Engineer), and one Administrative Assistant (Ms Lamia Khazen). The remainder of the "project team" consisted of the technical specialists (e.g. national and international consultants) and partner organizations contracted to deliver specific project outputs. The role and responsibilities of the members of the PMU are listed in **Table 8**. As can be witnessed from the profiles of the members, the expertise of the PMU was primarily technical or engineering. The MTR had made the observation that the PMU's biased technical profile did not reflect all the legal and regulatory (concessions and regulator), marketing (local value change), financial (models for wind energy projects) or sensitization and awareness.[32] The MTR requested for the profile of the PMU to be enhanced in Business Management and Business Finance, not necessarily by recruiting a new person, but to also prospect drawing

[32] Equitao. (2012). Evaluation à mi-parcours du projet "Développement du secteur privé éolien » (ANME, Tunis), pp50-51.

from similar expertise from within ANME. It is to be noted that the recruitment of an extra person may have increased the project management cost that would have been contrary to the request made by UNDP to the DG, ANME following the MTR to contain project management cost during the remaining of the project lifetime.[33] Should the recruitment of this new person have increased the project management cost, the solution to enhance the profile of the PMU as suggested by the MTR would have been to seek a similar expertise from within ANME. Also, given the fact that one engineer recruited by the project resigned in 2010, and that the Administrative Assistance integrated the institutional structure of the ANME, there was probably the possibility to recruit this new person without necessarily increasing the project management cost. It is pointed out that the project management cost at the end of December 2014 of 19.6% (or 17.6% if additional project expenses to end of March 2015 are included) of total GEF funding is lower than both the 22.5% planned in the project document and the 24.6% recommended by the MTR. Nevertheless, it is to be noted that the recommendation to diversify the profile and competencies of the PMU towards management and finance was not put into practice.

Table 8. Roles and responsibilities of the members of the PMU.

Position in PMU	Role and responsibilities
Project Manager	In charge of managing the PMU and to carryout overall coordination for the TWED project. The PM also reports to the PSC and is responsible for delivering the project reports.
Energy Engineer	He was responsible for following up on the evaluation of concession models with the required contractual documents, and the FiT (Outcome 3).
Electrical Engineer	He has the responsibility for Outcome 1 as well as ensuring technical support to the IPP Group.
Industrial Engineer	She was in charge of Outcome 2. In particular, overseeing the delivery of trainings and capacity building for local industries.
Administrative Assistant	She was responsible for the PMU Secretariat, follow ups with UNDP, tracking project expenses and to contribute to project reporting

The Project Steering Committee (PSC) was established to oversee project implementation and comprises the following organizations/representatives:[34]

- National Energy Management Agency (ANME)
- United Nation Development Programme (UNDP)
- IPP Group
- Directorate General for Energy (DGE)
- Tunisian Company for Electricity and Gas (STEG)
- STEG Renewable Energies (STEG RE)
- GEF focal point in Tunisia

[33] Letter dated 20 September 2012 emanating from the UNDP to ANME with subject "Approval of extension request for the GEF-UNDP project".

[34] The Project Document did not propose the composition of the PSC. The list of institutional members of the PSC reported here is taken from the undated publication by the Ministry of Industry and Technology, TWED – Tunisian Wind Energy Development (ANME, Tunis).

The role the PSC was to review progress, discuss implementation issues, and ensure close coordination among the project participant. The PSC was chaired by the Director General of the ANME (or alternate). The Project Manager also assisted the PSC meeting to answer the queries that the members of the PSC had about the project.

As part of its mandate to orient the project, the PSC had the responsibility to approve Annual Work Plans (AWPs), including budgets, as well as progress reports on project achievements, and to carry out meet its quality assurance role and responsibilities. The PSC was expected to meet once every four months or when the Project Manager finds it necessary. As discussed in Section 5.3, evidence shows that there have been shortcomings regarding the role of the PSC. The private sector representation is conspicuously lacking on the PSC. This is further discussed in Section 3.3.5.

3.3 Project Relevance

3.3.1 Relevance at National Level

In addition to the strategy to deliver 30% of renewable electricity through the TSP by 2030 that is discussed in Section 2.2.1.3, Tunisia has developed a legal framework to promote renewable energy and the efficient use of energy over time.

The Tunisian energy market is a regulated market, the key regulations for which include:

- **Law No. 72 of 2 August 2004**, concerning energy management, paving the way for the publication of new implementing legislation to support energy efficiency, as amended by Law No. 7 of 9 February 2009, which additionally introduced important elements of promotion of renewable energies, in particular relating to electricity production;
- **Law No. 82 of 5 August 2005**, which enabled the creation of the *Fonds National de Maîtrise de l'Energie (FNME)*. **Figure 5** shows the different taxes, including the registration of first car ownership (70%), air-conditioning equipment (25%) and incandescent lamps (4%), which are used to capitalize the FNME (4%).

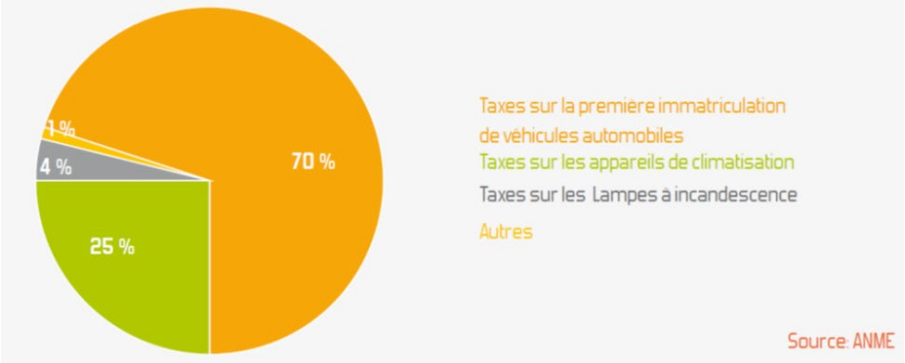

Figure 5. Share of different taxes used to capitalise the FNME (Source: ANME, 2013).

The FNME is used to finance three principal types of interventions: energy efficiency, renewable energy and fuel-switching. In January 2014, the FNME has been transformed

into the Energy Transition Fund (ETF)[35], with a view to enlarging the sources and means of capitalisation of the Fund. These changes are covered under Articles 67 and 68 of the Finance Law 2014.[36] The ETF will be capitalised by two additional sources of tax on: (i) energy products consumed;[37] and (ii) imported motors and second-hand spare parts. This change reflects the recognition that the levels of funding required to transform the power sector are much higher than the means of the original FNME.

The regulations governing the production of electricity from renewable energy sources are:

- **Decree No. 362 of 9 February 2009**, amending and supplementing Decree No. 2234 of August 22th 2005.
- **Decree No. 2773 of 28 September 2009,** establishing the conditions for electricity transmission, the sale of surplus to STEG and a cap on such sales. Prices of the sales are set by the Minister of Industry. Under this regulation, companies operating in the industrial, agricultural or tertiary sectors are allowed to generate renewable electricity for internal consumption (i.e. auto-production), with the ability to export a maximum of 30% of this self-generated electricity to the national grid on an annual basis. The purchase price paid by STEG to the auto-producer is the same price applicable to consumers and varies depending on the grid voltage connecting the plant with the grid.[38]
- With technical support from the TWED project, a Renewable Energy Law was proclaimed in 2014 by the National Constituency Assembly (NCA) This law proposes three ways in which renewable electricity can be produced:
    - Auto-production – applicable to any local government institution or public or private enterprise that is active in the industrial or agricultural sectors. The conditions for the transport of electricity and the sale of any excess production to STEG, including the maximum quantity of renewable electricity that can be sold, will be defined by a subsequent ordinance. The law stipulates that the auto-producer must also be the owner of the renewable power plant/facility. The conditions are similar to those contained in Decree No. 2773.
    - Independent power generation for sale entirely and exclusively to STEG – the power generation project will be reviewed by a technical committee, which will make necessary recommendations to the Ministry overseeing the energy sector. Typically, the maximum installed renewable capacity will be specified by ordinance. For projects that exceed the maximum installed capacity, a competitive bidding process will be adopted.
    - For export – the project must be of national interest and will be developed through a concession. A technical committee will study the technical and financial viability of the project, and make recommendations to the Ministry overseeing the energy sector. The transmission of the electricity can be

[35] Government of Tunisia (2014), *Tunisia: Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding*. pg. 6.
[36] See http://www.finances.gov.tn/index.php?option=com_jdownloads&view=viewcategory&catid=9&Itemid=306&lang=fr – accessed 4 June 2014.
[37] The list of energy products and the means of tax recovery will be established by Decree.
[38] This implies that the practice of cost-reflective electricity tariff by STEG (i.e. when subsidies are removed) will increase the financial attractiveness of RES for potential auto-producers.

made either along a dedicated power line (in which case the promoter will cover all the investment and maintenance costs, and cede the transmission line free of charge to STEG after termination of the contract) or by using the national grid if it has the capacity to do so.

Tunisia has acquired some experience with mitigation projects through the Clean Development Mechanism (CDM) of the Kyoto Protocol (KP). As of 1 June 2014, Tunisia had registered 6 projects in sectors covering wind energy (grid-connected), fossil fuel switching, mass rapid transit, and landfill gas capture and flaring, while another 2 projects (fuel switching and rural electrification and water supply by means of PV) were at validation.[39] Tunisia is implementing a Programme of Activities (PoA) for the dissemination of solar water heaters, with 8 Component Project Activities (CPAs) registered to date. The Coordinating Entity is ANME. PoAs may be seen as a stepping stone for scaling-up mitigation actions and as a precursor to NAMAs.[40] Further, experience with the CDM has revealed that a project-based mechanism may not be appropriate in Tunisia's economy, which is predominantly built on small and medium-sized enterprises (SMEs).[41] The specific context of Tunisia favours a programmatic or sectoral approach, such as that embodied in NAMAs. As discussed in Section 4, NAMA development is one area where the TWED project has also provided technical support.

3.3.2 Relevance to Multilateral Environmental Agreements

Tunisia, having signed and ratified the United Nations Framework Convention on Climate Change (UNFCCC) on 15 July 2013, and having acceded to the Kyoto Protocol as a non-Annex-I country in June 2002,[42] has maintained a strong commitment to the objectives developed by the international community for the integrated environmental and economic response to the threat of climate change. The Convention entered into force on 28 November 1994.[43] As discussed in Section 3.3.3, the TWED project is aligned with the GEF objective of supporting implementation of the UNFCCC for "stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system."[44]

Tunisia is also one of the 113 countries to agree to the Copenhagen Accord (Decision 2/CP.15). Non-Annex I Parties to the Convention were expected to submit their mitigation actions to the UNFCCC Secretariat, which would be consistent with Article 4.1 and Article 4.7 (of the UNFCCC) and aligned with sustainable development. The Government of Tunisia communicated its list of NAMAs to the UNFCCC Secretariat on 17 May 2010 while qualifying that their implementation would require international support (i.e. supported

[39] Information obtained from http://cdmpipeline.org/ - accessed 4 June 2014.
[40] KfW Bankengruppe (2011), *How to Develop a NAMA by Scaling-Up Ongoing Programmatic CDM Activities: On the Road from PoAs to NAMAs*.
[41] Presentation made by ANME on the "Organising framework for scoping of PMR activities", 14 February 2014, Mexico.
[42] République Tunisienne. (2014). Seconde Communication de la Tunisie à la Convention Cadre des Nations Unies sur les Changements Climatiques. (Ministère de l'environnement, Tunis), pg. 6.
[43] http://unfccc.int/essential_background/convention/status_of_ratification/items/2631.php - accessed 30 July 2012.
[44] GEF Secretariat (2010) GEF-5 Programming Document: Sixth Meeting for the Fifth Replenishment of the GEF Trust Fund, Paris, 12 May 2010.

NAMAs), technology transfer and capacity building, and that developing projects under the CDM would not be excluded.[45]

3.3.3 Relevance to GEF Strategies, Priorities and Principles

The overall goal of the GEF in climate change mitigation is to support developing countries and economies in transition toward a low-carbon development path. The project was approved under the strategic priorities for GEF-4 (July 2006 – June 2010),[46] but is also aligned with the strategic priorities for GEF-5 (July 2010 – June 2014).[47] Consistent with the GEF Operational Project 5 Focal Area of climate change mitigation, the TWED project supports Strategic Objective 3: "Promoting investment in renewable energy technologies".

The TWED project supports the GEF principles as follows:

(i) responsiveness to Convention guidance – incremental funding from GEF towards the project exemplifies this responsiveness;

(ii) consideration of different national circumstances of recipient countries – the project has established the problems facing wind power development in Tunisia and was developed to tackle the national barriers as discussed in Sections 2.2, 3.3.1 and 3.3.2; and

(iii) cost-effectiveness in achieving global environmental benefits – the project was initially designed to deliver direct global environmental benefits of GHG emission reductions of 0.91 US$/$tCO_{2e}$.[48] However, as discussed in Section 5.4, the TWED project is not anticipated to deliver any direct GHG emission reductions during its lifetime (i.e. until end 2014). Indirect GHG emission reductions of the project have been estimated at ~3.1 – 3.8 $MtCO_{2e}$, resulting in the cost-effectiveness of ~0.53 - 0.65 in achieving global environmental benefits.

3.3.4 Country-drivenness and ownership

Country ownership is an important feature of the project assessment since it provides an indication of the future sustainability of the project. There are several key indicators that show that the TWED project was fully owned by the Government of Tunisia. For instance,

1. The concept of the project originated at ANME, which has been actively pursuing the promotion of renewable energies in Tunisia;[49]
2. The project was relevant to the on-going national efforts to address the increasing energy deficit of Tunisia and its over-reliance on Algerian gas[50] at a crucial time when public sector debt has reached around 51% of GDP,[51]

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[45] https://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/tunisiacphaccord_app2.pdf - accessed 26 February 2015.

[46] For the focal area strategic approach for GEF-4, see GEF Council document GEF/C.31/1, "Focal Area Strategic and Strategic Programming for GEF-4," July 16, 2007.

[47] For the focal area strategic priorities for GEF-5, see GEF Council document GEF/R.5/31, "GEF-5 Programming Document," May 3, 2010.

[48] With the estimated direct project impact of 2.2 million tCO_2 reduced, the cost effectiveness of the GEF support can be estimated at USD 0.91 per tonne CO_2 reduced. An additional direct post-project emission reduction of 1.5 million tCO_2 implies a further reduction in abatement cost to USD 0.54 per tCO_2.

[49] Meeting with Mr H. Harrouch, DG, ANME – 9 December 2015.

[50] Quoted in Project Document entitled "Support to energy transition and to the implementation of a low-carbon development strategy (SET-LCD) in Tunisia by 2020 and 2030" (UNDP, Tunis November 2013), pg. 8.

3. The TWED was relevant from the perspective of mitigating the effects of energy subsidies. The increasing dependence on imported fossil fuels places a substantial financial burden on the national economy, and this is further exacerbated by energy subsidies provided by the State. A World Bank study has made the case for comprehensive energy subsidy reform while consolidating a targeted safety net for vulnerable households and providing temporary support to key economic sectors.[52] The World Bank has reported that 51% of all energy subsidies in 2013 were allocated to electricity generation. Regarding the consumption of electricity, the lowest income-earning households (the lowest quintile) benefited from 13% of the total subsidies whereas the highest income-earning households (the highest quintile) benefited from 29% of subsidies. So in addition to being a burden on the State, energy subsidies perversely enhance socio-economic inequity;
4. The TWED project has pre-empted the requirements for large-scale private investments for the implementation of the TSP. The implementation of the TSP will require significant levels of investment, estimated at €6,040 million on a cumulative basis between 2013 and 2030.[53] The principal sources of funding to implement the TSP have been identified as: (1) Government funding; (2) concessional loans from international development agencies; (3) national and international financial institutions; and (4) private-sector investment. Because these levels of investment are beyond the capacity of public finances, especially when considering competing public needs (e.g. poverty reduction, infrastructure development, health, etc.), the TSP places emphasis on catalysing private-sector investments through a combination of: (i) feed-in-tariffs (FiTs); (ii) private concessions through transparent competitive bidding processes; and (iii) public-private partnerships;
5. The project staff are housed at ANME, which is the implementing institution of the TWED project; and
6. The PSC is chaired by the Director General (or designated alternate) of ANME, implying the highest level of direct oversight given to the project by the implementing institution.

3.3.5 Stakeholder Participation in Implementation

Several weaknesses have been noted concerning stakeholder participation. Some of this has been discussed in Section 2.2.3. The first weakness has been the low level of private sector representation in the project, especially on the PSC. This has been singled out as a key weakness since the project aims principally to support the private sector to invest in wind energy in Tunisia. This is despite the fact that the private sector has benefited from trainings and capacity building activities.

In a meeting of the PSC in May 2010, the UNDP had proposed private sector representation to be co-opted on the PSC. At the same meeting a proposition to invite a representative of UTICA was made. It is worthy to note that the PSC made another recommendation for co-opting the representation of a member of UTICA (Union Tunisienne de l'Industrie du

[51] Please see: http://www.indexmundi.com/tunisia/public_debt.html - accessed 26 February 2015.
[52] World Bank (2013), *Vers une Meilleure Equité: les Subventions Energétiques, le Ciblage et la Protection Sociale en Tunisie*, rapport n. 82712-TN.
[53] The investments are measured in 2012 €, and are equivalent to € 3,186 million in present (2012) value using a discount rate of 8%.

Commerce et de l'Artisanat) on the PSC during its meeting in September 2011. Despite the fact the lack of private sector participation on the PSC was identified as a weakness needing to be redressed by the MTR, the situation has remained unchanged. The PM mentioned that the UTICA was invited to nominate one of its members for the PSC but that no response was received. Since private wind development is only nascent in Tunisia, it is highly probable that UTICA could not find a member of the right profile for representing the private sector on the PSC of TWED. In this case, and since the project had engaged with private sector operators such as Enerciel and Gabes Cement Factory, it appears that there were other private sector options that were available beyond UTICA. This was confirmed by representatives of these companies during field surveys (please see **Annexes 3** and **4**). An invitation had also been sent to another private sector umbrella organization, namely la Chambre Syndicale des Energies Renouvelables (CSER), to be represented on the PSC. The CSER declined the invitation most probably because its focus is mainly on solar water heaters and solar PV.[54]

Another weakness has been the low level participation of STEG in the project. Despite the fact that STEG was represented on the PSC, resistance from STEG regarding liberalization of power generation has been stiff. The MTR had already identified this standoff, while noting that it was political in nature and was amplified by the post-revolution resistance of the STEG workers' union regarding the liberalization of the power generation market. As is discussed in the next section, the resistance of STEG was one of the main reasons articulated for why the PSC could not play its role of political decision-maker.[55] So while there was representation of STEG on the PSC and STEG participated in all the activities of the project, it is clear that this representation was mainly technical in nature. Hence, political issues related to resistance to change could not be properly addressed. This highlights that the PSC operated as a technical committee rather than a structure to provide oversight and political support to the project.

There is no evidence that civil society organizations (CSOs) or not-for profit organizations (NGOs) participated actively in the project. Although the main goal of the project may be seen as not involving the general public, it should be noted that all impacts (negative or positive) of wind farms are felt at the local level, especially local communities who live in proximity to wind installations. Having the views of the CSOs/NGOs is always desirable when looking at value chain of wind energy technology. For instance, the views and opinions of CSOs/NGOs form an integral part of the enabling environment in which wind technology is promoted.[56] This shortcoming stems from the design of the project, and it would be useful to involve CSOs/NGOs in projects similar to TWED. Another instance where the role of CSOs/NGOs would have been instrumental concerns the promotion of the new RE Law that the project has supported. Having broad civil society support for the newly formulated law would have had positive spillover effects for the implementation of

[54] Interview with Mr Nafaa Baccari, Project Manager, TWED – Monday 8 December 2015.
[55] Ibid.
[56] Boldt, J. I., Nygaard, I., Hansen, U. E., & Traerup, S. (2012). *Overcoming Barriers to the Transfer and Diffusion of Climate Technologies.* Denmark: UNEP Risoe Centre.

REs at the regional level. Here again the project missed an opportunity to engage with CSOs/NGOs.[57]

The MTR had also recommended the participation of the Ministry of Finance, Prime Minister's Office, and the Ministry of Regional Development and Planning in order to make the economic and financial case for renewables, obtain the highest level of political support that may have been used to address, at least partially, the resistance of STEG, and to integrate wind energy (and more broadly renewable energies) develop in the development agenda of the regions.[58] However, there is no evidence for the involvement of the Ministry of Finance, the PMO and the Ministry of Regional Development and Planning in the project after the MTR had been completed.

3.4 Project Management and Cost Effectiveness (Efficiency)

Overall the **efficiency** of the project is rated ***moderately satisfactory***. The project management arrangements, as discussed in Sections 2.2.3, 3.2 and 3.3.5 describing the implementation approach and stakeholder engagement, do not appear have been used optimally to produce cost-effective execution of the work plan. For instance, there is no evidence that the PSC has played its role and executed its responsibilities as expected, implying shortcomings in the overall quality assurance of the project.

Overall project disbursement at the end of December 2014 was 84%, of which salaries of PMU staff represents 9.3% (Outcome 4). The planned budget for Outcome 4 that covers project management costs was planned to be 22.5% of total GEF funding, and actual expenditures stood at 19.6% and the end of December 2014 (see **Table 11**).

According to the Project Document, the PSC was expected to meet every four months. Documentary evidence provided by the PMU has revealed the following number and frequency of PSC meetings: 2010 – one meeting on 6 May 2010; 2011 – three meetings on 3 Jan 2011, 17 February 2011 and 7 September 2011; 2012 – two meetings on 27 March 2012 and 24 October 2012; and 2013 – two meetings on 24 April 2013 and 17 July 2013. No evidence (minutes of proceedings) was provided by the PMU for PSC meetings in 2014. On the basis of the information provided, the FE can confirm several issues that were already raised during the MTR:

- The PSC acted more like a technical advisory committee to validate the project deliverables as evidenced by its meeting of 17 February 2011 that took place within almost one month of the previous PSC meeting, and that of 24 April 2013 that validated the technical reports concerning the 'procedural manual for the implementation of a wind energy project', and 'tariff mechanism' that were prepared by ALCOR/AXENNE;
- Based on this observation, the MTR had recommended the setting up of a Strategic Committee to provide political guidance to the existing PSC and PMU. This was not implemented because of continued resistance from STEG to be involved in the TWED project beyond its technical representation/input.[59] The MTR had also

[57] In September 2014, the UNDP supported a meeting at the ANME involving the private sector and CSOs/NGOs to propose recommendations regarding the proposed RE Law to the Energy Commission of the National Constituency Assembly.
[58] Equitao (2012), pg. 63.
[59] Discussions with the Project Manager on Monday 9 December 2015.

recommended the inclusion of a private sector representation on the PSC, and this was not achieved during the project lifetime as discussed in Sections 2.2.3 and 3.3.5. The typical terms of reference for the PSC (or Project Board) is shown in **Annex 9**;

- As discussed in Section 3.3.5, the lack of inclusion of other stakeholders such as CSOs/NGOs, Ministry of Finance and the PMO may have adversely affected the project management. However, it is pointed out that the Ministry of Finance was invited to attend and it attended the PSC that was held on 24 July 2013 (but the Ministry of Finance was not invited to the PSC that was held on 17 July 2013);
- Work plans and corresponding budgets were expected to be prepared annually for approval by the PSC. Because there is scattered evidence for quarterly meetings of the PSC, it is difficult to gauge the effectiveness in project management. Also, the AWP that was discussed at the last PSC meeting for which evidence was provided (i.e. 24 October 2012), the work plan covered the period October 2012 to December 2013. This time period is not aligned with the calendar year that is used for financial monitoring, making the reconciliation between project deliverables and financial monitoring more difficult. Changes were made in 2013 and 2014 to align project planning with the Jan-Dec calendar year. As discussed in Section 3.5, there is evidence of shortcomings in annual project plans that cast doubt about project management effectiveness; and
- Official annual or semi-annual budget revisions are completed as necessary (approved by UNDP), to reflect updates in the project work plan. Here again, there is no evidence that the PSC was apprised of budget revisions. Although the project monitoring and evaluation (M&E) plan calls for an annual audit, the project was audited only once in 2012.

The project followed standard UNDP financial management procedures, with the project budget managed between the PMU and UNDP staff using the ATLAS system. The financial analysis discussed in Section 3.5 made use of the CDRs generated from ATLAS.

The management of the project has been adversely affected by the turnover of personnel directly involved in the project or having an influence on the implementation of the project. These can be summarized as follows:

- Changes within the PMU have affected the dynamics of the project. Also members of PMU being located within the ANME were also involved in other activities of the Directorate of Renewable Energies. Even if this was beneficial for the members of the PMU, this was at the expense of the project implementation, monitoring and evaluation;
- Since the beginning of the project three UNDP program officers were changed revealing variations in working method. Also, the UNDP programme officer has several projects under her portfolio implying division of time. Hence, it was not always possible to provide due attention to the project; and
- The Director General of the ANME, who is also the Director of the project, changed three times over the course of the project.

3.5 Financial Planning by Component and Co-financing

The TWED project was a Global Environment Facility (GEF) funded Full-Sized Project (FSP), with GEF support of US$ 2,000,000 (excluding the GEF Agency fee and the PPG funding), and an originally proposed in kind co-financing of US$ 2,000,000 from ANME for a total budget of US$ 4,000,000.

3.5.1 Financial Planning by Component

The original financial plan proposed over the 3-year duration of the project is shown in **Table 9**. Although the TWED project was implemented over 6 years, it is still useful to investigate the effectiveness of financial planning by comparing the actual expenses of the four project outcomes against the planned budget allocation shown in **Table 9**. Together with the recommendations of the MTR, this provides a useful approach to discuss the effectiveness of the project financial planning. The ratio of planned budget allocation of Outcome 1, 2, 3, and 4 to the total GEF funding were 20%, 37.5%, 20%, and 22.5%, respectively. It should be noted that a budget of USD 200,000 was allocated for project M&E. In the absence of any other sources of cash co-financing, the M&E expenses were expected to be covered under Outcome 4.

Table 9. The planned project budget taken from the Project Document.

Award ID:	**00035597**
Award Title:	**PIMS 2129 CC FSP: Wind Energy**
Project ID:	**00038270**
Project Title:	**PIMS 2129 CC FSP: Private Sector Led Development of On-Grid Wind Power in Tunisia**
Executing Agency:	**NEX: National Energy Management Agency (ANME)**

GEF Outcome/Atlas Activity	Responsible Party (Implementing Agent)	Source of Funds	Atlas Budgetary Account Code	ERP/ATLAS Budget Description/Input	Amount (USD) Year 1	Amount (USD) Year 2	Amount (USD) Year 3	Total (USD)
OUTCOME 1: regulatory and institutional framework enabled	ANME	GEF	71200	International Consultant	120,000	100,000	80,000	300,000
			71600	Travel	10,000	10,000	10,000	30,000
			71300	National Consultant	30,000	30,000	10,000	70,000
				Sub-Total	160,000	140,000	100,000	**400,000**
OUTCOME 2: Technical and organizational capabilities of key stakeholders strengthened	ANME	GEF	71200	International Consultant	390,000	0	80,000	470,000
			716000	Travel	20,000	0	10,000	30,000
			71300	National Consultant	165,000	45,000	40,000	250,000
				Sub-Total	575,000	45,000	130,000	**750,000**
OUTCOME 3: Technical assistance to IPP Group	ANME	GEF	71200	International Consultant	200,000	100,000	70,000	370,000
			71600	Travel	20,000	0	10,000	30,000
				Sub-Total	220,000	100,000	80,000	**400,000**
OUTCOME 4: Monitoring and Evaluation support	ANME	GEF	71200	International Consultant	69,000	31,000	15,000	115,000
			716000	Travel	25,000	10,000	0	35,000
			71300	National Consultant	30,000	30,000	15,000	75,000
			74500	Miscellaneous	5,000	5,000	5,000	15,000
			72200	Equipment and Furniture	10,000	0	0	10,000
			71400	Contractual Services	67,000	67,000	66,000	200,000
				Sub-Total	206,000	143,000	101,000	**450,000**
					TOTAL			**2,000,000**

The financial analysis has been carried out using the CDRs obtained from UNDP for 2010, 2011, 2012, 2013 and 2014, and the results are shown in **Table 10**. No funding was contributed by the GEF Agency, so the expenditures in **Table 10** are for GEF funding only.

Table 10. Breakdown of expenditures to 31 December 2014.

Outcome	2009	2010	2011	2012	2013	2014	TOTAL
1	1,471.43	42,128.75	39,811.87	113,449.77	181,005.27	166,855.43	544,702.52
2		1,476.46	147,007.78	178,662.01	81,365.39	206,138.45	614,650.09
3		34,341.91		6,429.68	35,992.42	113,469.00	190,233.01
4	23,858.16	80,405.62	77,907.89	85,244.00	30,973.17	31,466.96	329,855.80
TOTAL	**25,329.59**	**158,352.74**	**264,727.54**	**383,785.46**	**329,336.25**	**517,929.84**	**1,679,461.42**

Several observations can be made concerning the project financial planning:

- At the end of 2014, the total project expenses amounted to 84% of the total GEF funding. An incomplete AWP was provided for 2012. Based on 2013 and 2014 AWPs, the planned budgets for 2013 and 2014 were USD 257,445.87 and USD 907,676.79, respectively. The CDRs showed that the actual expenditures were USD 329,336.25 (2013) and USD 517,929.84 (2014). Therefore, in 2013, actual expenditure exceeded the planned budget by ~30%, whereas it was lower by ~43% in 2014. These significant variations between planned and actual expenses cast doubts regarding the effectiveness of project planning and budgeting. The independent audit that was carried out by KPMG in 2014 shows that budget revisions were carried out in ATLAS to reconcile these variations;

- However, there is evidence that the delivery rate will increase before project closure with the completion of the following six activities:[60]

  (i) The production of a documentary on wind energy in Tunisia;
  (ii) A policy study on strategies for centralized planning for wind projects;
  (iii) Updating Tunisia's wind map;
  (iv) Editing and printing of project deliverables and principal studies;
  (v) Financial audit, and
  (vi) Project Final Evaluation

  The UNDP provided a Project Resource Overview[61] showing that USD 197,880 had been committed for the above activities. Including these commitments, the final project expenditure is expected to reach USD 1,877,341.42 – i.e. approximately 94% of the total GEF funding.

- Following delays in implementation in 2009 and 2010 (that were reviewed in the MTR), project expenses picked up with an increase in project deliverables between 2011 and 2014 (except for a plateau in 2013). Twenty six (26%) per cent of total GEF funding was spent in 2014, as opposed to 7.9% in 2010. In 2009, ~79% of all spending was on the acquisition of office machinery.

- PMU staff (except for the PM) was recruited on Service Contract and were paid under Outcome 4. The total salary-related expenses were USD 156,900.35, representing ~9.3% of the total GEF funding, and are found to be reasonable.[62]

- Two independent audits have been carried out by KPMG for expenses accruing between 1 January and 31 December 2011, and between 1 January 2014 and 31 December 2014. The audit reports found that the expenses: (1) were in conformity with the approved project budget; (ii) were related to the project activities, (iii) conformed to the policies, rules and procedures of the government, and (iv) were supported by receipts or other supporting documents.[63] According to the M&E plan, an independent audit was supposed to be carried out every year. However, this evaluation has revealed that only two independent audits were carried out in 2012 and 2015.

- The MTR had proposed a budget reallocation between the different outcomes. **Table 11** summarizes the ratio of budgeted or actual outcome expenditures to the total GEF funding. Comparative analysis shows that at the end of 2014, a disproportionate level of spending took place under Outcome 1, and conversely, spending on Outcome 3 was only approximately 47.6% of the expected target. Under expenditure on Outcome 3 is cause for concern, as had been identified in the

[60] These are derived from the 2014 PIR.
[61] The Project Resource Overview was generated on 19 April 2015.
[62] A letter was communicated by the UNDP to the Director General, ANME on 20 September 2012 in which there was concern for escalating project management costs, and a request was made to review the staffing structure of the PMU.
[63] KPMG. (2012). Rapport d'Audit – Examen du Projet Private Sector Led Development of On-Grid Wind Power in Tunisia. (KPMG, Tunis); KPMG. (2015). Rapport d'Audit – Examen du Projet Développement par le Secteur Privée de l'Electricité Eolienne Connectée au Réseau. (KPMG, Tunis)

MTR, especially because Outcome 3 (IPP wind concession models and documentations, and FiT) can be seen as the outcome with catalytic effect once the regulatory framework has been established as is now the case in Tunisia. The establishment of a local value chain for supporting wind energy development is desirable, but not a necessary condition for the successful implementation of private wind energy projects in Tunisia (e.g. Outcome 2). However, the PSC approved a budget revision that halved the budget of Outcome 3, while bringing a corresponding increase in the budget of Outcome 2. These changes appear to be counter-intuitive to the overall purpose of the project. Actual expenditures show that there has been overspending on Outcome 1 regardless of which proposed target is chosen for comparison.

Table 11. Ratio of Outcome budget allocation or expenses to the total GEF funding.

Outcome	Ratio proposed in Project Document	Ratio proposed in MTR	Ratio approved by PSC in 2012[64]	Ratio of actual expenses[65] (Table 10)
1	20.0%	23.0%	26.1%	32.4%
2	37.5%	32.4%	45.2%	36.6%
3	20.0%	20.0%	10.0%	11.3%
4	22.5%	24.6%	18.7%	19.6%
Total	**100.0%**	**100.0%**	**100.0%**	**100.0%**

According to the minutes of the PSC that was held on 24 October 2012,[66] encumbered expenses stood at USD 915,958.64 (Outcome 1 = USD 200,593.28; Outcome 2 = USD 433,030.14; Outcome 3 = USD 0; Outcome 4 = 282,335.22). Based on the budget revision proposed in the MTR, the PSC agreed to the relocation of remaining funds as follows: Outcome 1 – USD 320,000; Outcome 2 – USD 470,000; Outcome 3 = USD 200,000 (i.e. a 50% cut); Outcome 4 = USD 90,000).

3.5.2 Co-financing

According to the approved Project Document, ANME was expected to provide co-financing to the tune of USD 2,000,000. The in-kind contributions were expected to be USD 700,000, while parallel financing was expected to be USD 1,300,000. The in-kind contributions are deemed to be highly satisfactory, with such contributions taking the form of the salary and overheads of the Project Manager, office space, technical support staff, and office furniture and equipment. The parallel co-financing has exceeded expectations through several baseline supported projects that are summarized in **Annex 7**.

[64] Presentation made by the Project Manager to the PSC on 24 October 2012.
[65] The percentages are calculated based on total expenditures at 31 December 2014 (i.e. USD 1,679,461.42). When the percentages are calculated using total GEF funding (i.e. USD 2,000,000), they are: Outcome 1 – 27.2%; Outcome 2 – 30.7%; Outcome 3 – 9.5%; Outcome 4 – 16.5%. These numbers give a total expenditure at the end of December 2014 approximately equal to 84% of total GEF funding.
[66] Ibid.

3.6 Flexibility and Adaptive Management

The TWED project has faced serious challenges some of which have occurred outside the project boundary such as the revolution that took place in January 2011. Another challenge that it faced throughout the project cycle and that took place within the project boundary was the resistance that STEG has demonstrated regarding the participation of the private sector in the generation of on-grid renewable electricity. These two challenges tested the adaptive management capacity of the project. Further, the implementation of, or lack thereof, the recommendations that the MTR had proposed can be used to gauge the level of flexibility of the project. These are further discussed below:

- Resistance from STEG: There is evidence that the project has not been able to adapt to the main challenge it faced, that is resistance from STEG for politically supporting private generation of on-grid electricity from wind power. This has been highlighted by the inability of the project to establish a Strategic Committee as proposed by the MTR in order to provide political support to the project and to provide a space for discussing institutional differences, especially those resulting in STEG resistance. The lack of an adaptive management approach resulted in the PSC acting effectively as a technical advisory committee to provide quality assurance on the project deliverables. In response, it would have been useful for TWED to develop a strategy to tackle the issue of STEG resistance at the beginning of the project implementation. This would have been especially meaningful given the fact that the resistance from STEG to support private sector involvement in renewable energy generation was not assessed in sufficient depth during project design;
- Revolution of January 2011: After the revolution of January 2011, the project did not carry out any activities for a period of at least six months.[67] When it resumed its activities, it did not make any changes to the implementation strategy. Yet, after the revolution that increased the democratic space, STEG workers' union became very hostile to private sector participation in power generation. There was confusion with the privatization of STEG that was not the case. This new situation provided a new opportunity to develop a strategy to deal with the issue of resistance to change, but that was not taken.

There were also issues related to the internalization (or not) of the recommendations of the MTR. The responses were mixed as is now discussed:

1. Issues related to the functioning of the PSC – As discussed in Section 3.4, the MTR had recommended the setting up of a Strategic Committee that would provide political guidance to the project, and that would constitute a high-level decision-making panel that would look at solutions to the problem posed by STEG resistance that has already been discussed. The setting up of the proposed Strategic Committee was not implemented. Another recommendation of the MTR was the inclusion of private sector representation, as well as that of other public institutions like the Prime Minister's Office and the Ministry of Finance, on the PSC. This was also not implemented. These examples show the lack of flexibility in project implementation and management approach. For instance, by squarely using its mandate, the PSC could have proposed the formulation of a strategy for obtaining the political support of additional stakeholders that may have helped provide more balance relative to

[67] Information obtained from UNDP's response to the questionnaire survey.

the position of STEG. A good example is the co-opting of the GEF Focal Point on the PSC to provide political support for the project both nationally and next to the GEF Council.

2. Other recommendations of the MTR: There are however other examples where the project was responsive to the recommendations of the MTR, such as the proposed activity on "Study and training for NAMA development potential in the renewable electricity sector in Tunisia". This was duly implemented and supported all the other complementary NAMA activities of ANME (see **Annex 7**). This study supported the development of the ANME-UNDP-GEF project "NAMA Support for the TSP" that will provide sustainability of the TWED project beyond its lifetime.

3.7 UNDP Project Oversight

UNDP is the responsible GEF Agency for the project, and carries out general backstopping and oversight responsibilities, as well as handling the financial accounts. UNDP is represented on the PSC to ensure UNDP's overall accountability for the project results. PSC decisions are made in accordance with standards that ensure managing for development results, cost-effectiveness, fairness, integrity, transparency and effective international competition. As discussed in Section 3.4, the PSC has not met as regularly as expected from the initial project design.

Project monitoring is carried out by the Head of the Environment and Energy Unit in the Tunisia Country Office and by the UNDP Regional Technical Advisor for Climate Change Mitigation in the Istanbul UNDP-GEF Regional Coordination Unit.

Financial monitoring and evaluation of the TWED project is carried out using the ATLAS tool of UNDP, which generates reports such as the CDR to gauge the level of delivery on all the outcomes of the project (see Section 3.5).

All evidence gathered during the evaluation mission indicates that UNDP is fulfilling its oversight and supervision responsibilities – except for the issue related to PSC meetings.in 2014, UNDP has worked with the project team to ensure comprehensive and timely financial and progress reporting. The UNDP has also provided technical input in the development of several terms of references, and in some cases it has recruited technical experts for developing same. The project supervision has also benefited from the in-country presence of UNDP at the country level, and its dedicated Environment and Energy Unit.

An agreement at the beginning of project implementation was that UNDP would provide recruitment services to the ANME up to a rate of 95%. This arose from the recognition of the implementing partner – i.e. ANME – that government procedures were complex and cumbersome. Nevertheless, the UNDP procurement process was experienced by the PMU as being lengthy and at times resulting in delays in project implementation.

Further, it would have been productive for the PMU staff to receive training from UNDP during the project to familiarize them with its rules and regulations, as well as on the use of the results framework as a planning and M&E tool. The training that was carried out at the beginning of the project did not reach all the members of the PMU, especially the technical staff.

3.7.1 Mainstreaming other UNDP Priorities

In addition to energy and environment, UNDP covers other priorities, including poverty alleviation, improved governance, the prevention and recovery from natural disasters, and gender. This section discusses how or to what extent the TWED project supports the mainstreaming of these other priorities. The first observation is that RE is not a panacea for all the priority areas. In the case of the TWED project, the objective is to reduce CO_2 emissions through the installation of on-grid utility scale wind farms. There is no direct link between this goal and gender development. However, there may be an indirect link through the setting up of a local supply chain for wind-power related technologies, and in which job creation could benefit both genders. The installation of wind farms in the remote or rural parts of Tunisia would also promote poverty alleviation through the generation of jobs and infrastructure development. However, it should be noted that since no wind farms have been installed by the private sector, none of these benefits have been delivered by the project.

Since the project does not impact other UNDP priorities, there are no indicators in the M&E framework to assess their mainstreaming.

3.8 Risks & Assumptions

The successful implementation of project outcomes and results depends on the validity of risks and assumptions underlying project design and formulation. The results framework shows the assumptions under which outputs are expected to be achieved. The Project Document also provides an analysis of risks that would confront the implementation of the project, and they have been found to be correct. However, new risks have been identified and the effectiveness with which the project tackled then is discussed.

Policy risk – The political will to push forward with the regulatory framework for on-grid renewables was identified as a risk. With the proclamation of the RE Law 2014, the government has demonstrated unambiguously its political will. However, as is discussed below, there are still risks related to the development and the implementation of the Decrees that will operationalize the RE Law 2014. It should be borne in mind that having a law and corresponding decrees is not sufficient to catalyse private investments in renewable energies. As discussed in Section 3.3.1, the Decree No. 2773 of 28 September 2009 was designed to operationalise the Law No. 7 of 9 February 2009 to support the implementation of renewable energy generation (among others), but these have not resulted in any auto-production of electricity from wind energy despite the willingness of the private sector.

Regulatory risk – The lack of an inadequate feed-in-tariff (FiT) to incentivize the development of wind power was identified as a risk. The project has developed a FiT for wind energy but these are yet to be adopted. Hence, this regulatory risk persists, especially in the absence of an independent regulator that would ideally be the institution that arbitrates over electricity tariffs as a party independent of the Ministry of Industry, STEG, and ANME. Nevertheless, the FiT developed by the project can be used to formulate the Decrees that are being developed to operationalize the RE Law 2014.

Economic risk – Another risk was identified as the lack of interests from international investors to invest in wind power generation in Tunisia. As mentioned in the MTR, there is increasing interests from international investors to invest in Tunisia. The proclamation of the RE Law 2014 can only have a positive effect on attracting foreign investment. However, there are several interrelated risks that were identified during the implementation of UNDP's Derisking renewable Energy Investment (DREI) in 2014 for the design of the ANME-UNDP-GEF project entitled "NAMA Support for the Tunisian Solar Plan".[68] While a total of nine risk categories have been analysed on their relative influences to increase the cost of capital for private sector investments in renewable energies (wind and solar PV), the relevant ones here are: (1) financial risks related to the low liquidity levels existing in the financial sector of Tunisia to provide capital; (2) macroeconomic and currency exchange risks between the Tunisian dinar and main foreign currencies that is particularly important if investments are made in foreign currencies and that the renewable electricity is denominated in the local currency. This risk category also covers the financial implications of RE investments due to inflation.

Institutional risk – The risk of private wind concessions not meeting international standards is still present since no such concessions have been applied to a tangible project thus far. The project has already proposed a concession model with established procedures and timelines based on international benchmarks. Hence, there is institutional preparedness to implement wind concessions based on international standards.

Risks posed by the revolution that took place in January 2011 in Tunisia were not foreseen during the project design. After this revolution, a new political context emerged in Tunisia with the emergence of new interest groups such as various lobbies at the level of the National Constituent Assembly that supported the views and opinions of such groups as the STEG workers' Union and emerging political parties. As already discussed, the vested interests of these groups did not necessarily favour the promotion of private sector participation in the generation of electricity. Although the Renewable Energy Law 2014 has been proclaimed, its operationalization requires the adoption of specific Decrees. Hence, there is still institutional space for these interest groups to continue that resistance to change. If this risk had been addressed at an early stage by the PSC with the support of ANME, which itself had submitted the draft RE Law to the Ministry of Industry, Energy and Mines, the project could have facilitated the strengthening of partnerships and facilitate more dialogue between the parties to clarify the purpose of the law in a context of increasing energy insecurity, increased trade balance deficit driven partly by the importation of primary energy, the incapacity of the government to support energy subsidies while there are other developmental priorities, and the lack of financial capacity for STEG to invest in adequate power generation infrastructure to meet the development needs of the country.

The successful implementation was based on five main assumptions. Two of these assumptions, namely that (i) the price of oil would remain above US$ 40-60/barrel, and (ii) the government is committed to launching its program for private sector-led on-grid wind

[68] UNDP (2014). *Tunisia: Derisking renewable Energy Investment*. New York, NY: United Nations Development Programme.

power production, were valid during the lifetime of the project. The latter can be inferred from the successful proclamation of the RE Law.

On the other hand, while the regulatory framework to promote private sector investments in renewable energies now exists, the incentives and safeguards that are contained in Decrees are yet to be formulated. As discussed earlier, the case of auto-production is a clear example of having a regulatory framework in place but without the necessary incentives and safeguards to promote private investments. One form that the incentives can take is an appropriate FiT. The project has proposed a set of FiT for wind energy, and it remains to be seen whether it will be applied during the design of Decrees that will operationalize the RE Law 2014. Also, an independent regulator is yet to be established in Tunisia that can act as an arbiter in the power sector.

3.9 Indicators for Monitoring and Evaluation

Typically, the results framework provides the road map by which the project should be implemented. It also provides the basis for M&E since it provides the indicators and sources of verification for measuring achievement of results and outcomes. Hence, adaptive learning is directly tied to the quality of the M&E system.

Figure 6 shows the indicators that are used in measuring the impact of the project initiatives, and the various elements of **Figure 6** are taken from the Project Document. It can be seen that the indicators and means of verification are given at the level of outputs that is sufficiently disaggregated to all performance assessments. However, there are indicators for which the sources of verification may not be accessible, such as the internal documents institutions (e.g. ANME, IPP group and STEG) because these sources that are either not in the public domain or within the project reporting boundary. Also, as discussed below, there are significant flaws concerning the definition of targets, and disconnections between the objectives and outcomes, and corresponding indicators and targets.

Figure 6. Indicators used in measuring the impact of project initiatives.

Impact to be Monitored	Indicators	Verification Means
Environmental CO_2 emissions reduction due to deployment of new wind power production capacity	- Reduction in CO_2 emissions - Private sector wind power investments	- IPP Group concession agreements (installed capacity) - Survey of private wind developers - Investment of US$ 60 Million from private sector
Policy Strengthened commitment of the government to push through a program of private sector-led on grid power	- Number of government documents supporting wind energy	- MIEPME internal documents
Regulatory		

Impact to be Monitored	Indicators	Verification Means
Adoption of an enabling regulatory framework that provides the necessary safeguards and incentives for private wind operators to invest in Tunisia's wind sector	- Regulatory framework adopted	- Government regulatory filings - Review of government regulatory legislation
<u>Economic</u> - Increased investment by international operators in Tunisia's wind infrastructure - Increased participation of Tunisian companies in the provision of equipment and services for the private sector wind farms	- Increased participation of Tunisian companies	- Survey of wind developers and local suppliers/service providers
<u>Institutional</u> - Availability of effective arbitration mechanism to resolve disputes between operators - Strengthened capacity of IPP Group to issue IPP tenders and finalize wind IPP concessions	- An arbitration mechanism in place - IPP Group issuing IPP tenders and finalizing wind IPP concessions - Tariff mechanism developed	- MIEPME arbitration procedures manual - IPP Group concession agreements - Concession models from IPP Group - FiT methodology and calculation
<u>Technical</u> - Strengthened capacity of the ANME to provide sound technical advice to the Ministry of Industry and Energy to guide policy decisions - Strengthened capacity of IPP Group to define technical parameters for wind IPP tenders - Strengthened capacity of the STEG to develop wind energy into the electricity grid	- Issuance of private wind concessions - Technical inputs for regulatory framework - Capacity of STEG to managed injection of wind power into the grid	- Project files - ANME internal documents - IPP Group files - STEG internal documents

Several of the indicators are poorly defined and may not be well connected to the targets that the project sought to achieve. Some examples are:

- Poorly defined indicators: One indicator is the 'issuance of private wind concessions' but there is no formal definition of what would constitute a private wind concession. Another example is the lack of definition of 'private sector wind power investments'. For instance, does wind power investments cover all investments that a private promoter would carry out prior to the capital investments in an actual wind farm and grid interconnection, such as wind energy resources assessments, interconnection studies and micro-siting of wind turbines? Or would 'investments' cover the actual capital investment in wind farm hardware and grid interconnection? These are important because they directly influence the way in which the impact of the project on direct global environmental benefits are calculated. For instance, if a wind project has been authorized by the Ministry of Industry to be installed under the auto-production law, such as the 45 MW wind farm project at the Gabes cement factory, and if that authorisation was considered to be a 'private wind concession', then the project could be counted as delivering direct GHG emission reductions even when installed outside the project lifetime.[69] In this example, it is also not clear whether the 'authorization from the Ministry of Industry' would constitute the 'issuance of private wind concessions'?
- Disconnection between objectives, targets and indicators: The project objective mention incentives will be provided for wind developers, and yet there is no incentive as an indicator or target. The only incentive is arguably the FiT that has been developed under Outcome 3 (output 3.2). Also, the project objective mentions a strategy for issuing tenders and yet there is only mention of concessions (Outcome 3 – output 3.1) and no clarity about the procurement process or interim steps; and
- Tenuous linkages between outcomes, targets and indicators: There are also examples where targets and indicators do not necessarily reflect an outcome. For instance, Outcome 1 seeks to establish an enabling regulatory and institutional framework in support of on-grid renewables. The indicator of this outcome 'strengthened commitment of government to push through a program of private sector on-grid wind power' is rather vague since it does not indicate any objectively verifiable metric to measure 'commitment of government'. Also, 'Government documents on wind energy' is not a target but rather a 'source of verification'.
  Similarly for Outcome 3, the indicator 'increased participation by private developers' and the target '60 MW of Wind Power installed by IPP' are not necessarily linked to the *ability* of the IPP Group to launch private wind concessions. Here, the result of launching the private wind concessions may be a 60 MW installed wind energy capacity, but this result says little about the ability of the IPP Group to launch a concession. This is also an example of where the process of launching a private wind concession that follows a sequence of activities is either not well understood or not clearly spelled out. Further scrutiny reveals that the 'increased participation by private developers' may be defined in ways, such as participation in project trainings and receiving the authorization to install 45 MW wind capacity

[69] This example is noted in the 2014 PIR. However, discussions with Mr Ghodhbani, Gabes Cement Company carried out in the context of this evaluation have revealed that the chances of implementing the 45 MW wind farm under the auto-production Law are very low. Also, it should be noted that the 45 MW wind energy project at Gabes is also a baseline project in the ANME-UNDP-GEF project entitled 'NAMA Support for the Tunisian Solar Plan'. In order to avoid double counting, the calculations of global environmental benefits in Section 5.4 have not considered the Gabes wind farm project.

under the auto-production law, other than in the capital investment in 60 MW wind farms.

The project was expected to deliver 2.2 $MtCO_{2e}$ of direct emission reductions during its three-year lifetime. It is argued that given the situation of power sector monopoly by STEG, it was unrealistic to assume that any reforms to accommodate IPP wind power suppliers **and** the commissioning of 60MW of wind power plants could take place within the 3-year project duration. As discussed in Section 5.4, the calculation of direct project emission reductions in the project document was not carried out according to GEF guidelines.

It is also worth noting that, an already difficult monopoly context was exacerbated by the revolution that took place in 2011 (post-2011 Arab Spring), with the rising political power of unions that are against power sector reforms, including the participation of private capital in power generation. There appears to be confusion among unions between power market liberalization to bring in efficiency and the privatization of STEG. These difficulties have been well discussed in the mid-term evaluation (MTE) report. There have also been resistance from STEG to fully participate and support the ANME-UNDP-GEF project, and this was discussed in Section 3.3.5.

The project Inception Workshop and mid-term evaluation (MTE) would have been appropriate fora for discussing and adjusting the direct global environmental benefits based on the above considerations, but that was not carried out. Although the technical assistance provided through GEF funding is aimed at generating direct global environmental benefits in terms of GHG emission reductions, the MTE did not discuss the issue of direct emission reductions at all. While it proposed alternative indicators and activities for the second half of the project, the MTE supported the initially proposed direct emission reduction target and 60 MW of installed private wind capacity.

As discussed in Section 5.4, one of the main impacts of the project will be the generation of indirect benefits. The cumulative indirect emission reductions over a period of 15 years[70] have been estimated at ~3.1-3.8 $MtCO_{2e}$ using the top-down and bottom-up approaches. This is approximately half the post-project indirect benefit of 7.3 $MtCO_{2e}$ that is provided in the Project Document.

The MTE had recommended new activities and indicators to be considered in the remaining half of the project. These activities and indicators are shown in **Annex 6**. Their implementation is also assessed in Section 4.

4. Project Performance and Results (Effectiveness)

4.1 Progress Towards Achievement of Expected Objective and Outcomes

The project was able to reach more than 80% of its results, which is commensurate with the overall project expenditures discussed in Section 3.5. However, the achievement of the results was not balanced. The first two outcomes of the project have been achieved and have seen more

[70] The 15 year timeframe has been adopted to coincide with the 2030 on-grid wind penetration targets proposed by the TSP.

involvement and imagination by the project. On the other hand, and as discussed in Section 3.5.1, progress on Outcome 3 was relatively lower. Based on the MTR, more effort should have been devoted to this outcome, and a partnership approach involving the private sector and the IPP Group, among others, would have been desirable. The results achieved by the project are significant, but many took much time to be realized especially between 2009 and 2010. With the revolution taking place early in 2011, that year was pretty difficult but promising with several changes that helped the project, especially a renewed emphasis to advance on the regulatory framework.

The commitment of ANME was important but can be the commitment of the line ministry could have been more forthcoming to secure ownership and institutional anchorage. This could have played a catalytic role in addressing the resistance that STEG has shown regarding the involvement of the private sector in power generation while noting that both ANME and STEG fall under the aegis of the Ministry of Industry, Energy and Mines.

The assessment has been carried out against the targets given the Strategic Results Framework shown in **Annex 5** and the additional activities emanating from the MTR that are listed in **Annex 6**. It is pointed out that some of the activities listed in **Annex 6** overlap with the targets shown in **Annex 5**, and these have been italicized. Also, the additional activities under Outcome 1 concerning: (1) Realization of a documentary on wind energy in Tunisia; and (2) Realization of communication products have been deemed more relevant under Output 4.1 that deals with project reporting issues.

4.1.1 Development Objective

Objective : To create a favorable regulatory and institutional fraemwork that will provide the necessary incentives for private wind developers to invest in Tunisia's power sector, while assisting the government in crafting the most appropriate strategy for issuing tenders.

Target 1: CO_2 emissions reduced by 2.2. million tons from direct impacts.
Achievement: No direct GHG emission reductions have accrued to date because there have not been any private sector investments in wind power. As discussed in Sections 3.9 and 5.4, only indirect emission reductions can accrue from the project legacy of putting in place an enabling framework (regulatory framework, concession models, FiT). The cumulative indirect emission reductions in the range ~3.1 – 3.8 $MtCO_2$ are expected by 2030 through the implementation of the TSP that will be supported by the ANME-UNDP-GEF proejct entitled 'NAMA Support for the Tunisian Solar Plan'.
Rating:. Unsatisfactory concerning direct emission reductions, but expected to be highly satisfactory concerning indirect emission reductions. However, it is highlighted that any lack of direct emission reductions should be ascribed to the very difficult power market structre – i.e. a near-perfect monopoly by STEG in generation, transmission and distribution, and sales of electricity - prevailing in Tunisia rather than shortcomings from project implementation. The situation has been compounded by the additional pressure imposed by STEG workers' union after the revolution in 2011.

Target 2: Private sector has invested US$ 60 million during life of project (totalling 60 MW on wind capacity).

Achievement:. This target has not been achieved and there are no private sector wind projects in Tunisia to date. As discussed as part of the lessons learned, it is pointed out that given the monopoly context and unfavourable policy and regulatory frameworks that the project faced, this target was not realistic.
Rating: Not achieved.

4.1.2 Outcome 1: Enabling regulatory and institutional framework has been established in support of on-grid renewable energy..

Output 1.1: Regulatory framework has been established for on-grid wind concessions

Target 3: Enabling regulatory framework provides the necessary safeguards and incentives for private wind developers

Achievement: The Renewable Energy Law 2014 that supports independent renewable power production for either auto-production or for sale to STEG or for exportation has been proclaimed. However, the incentives and safeguards are yet to be defined in Decrees that will be needed to operationalize the RE Law 2014.
Rating: Target has been partially achieved, but it is highly likely that the project deliverables such as FiT regime and concession models will influence the formulation of the decrees.

Output 1.2: Proposal for power sector arbitration mechanism is developed

Target 4: Arbitration mechanism defined and implemented by MIEM

Achievement: The project has started a dialogue concerning the setting up of an independent power sector regulator, including the different models that may be adopted in Tunisia. However, due to the ongoing resistance of STEG no decisions have been made yet concerning the exact form of the regulator. Hence, the independent regulator remains to be established by MIEM. Therefore the corresponding regulatory and administrative texts to define the procedures for submitting complaints and resolving disputes have not been completed.
Rating: Target has been partially achieved and the lack of complete implementation is testimony of the ongoing resistance by STEG, as well as the incapacity of the project stakeholders (including the PSC) to arrive at a political consensus that is for the good of the country.

4.1.3Outcome 2: Technical and organizational capabilities of key stakeholders have been strengthened.

Output 2.1: Technical assistance and capacity building provided to the ANME

Target 5: Technical wind absorption capacity study of the grid
Achievement: A ToR to investigate the impact of intermittent energy on grid and necessary grid stability precautions was launched but the bid was annulled because it was outside the budget scope.
Rating: Unsatisfactory.

Target 6: Specifications to interconnected private wind farm to the grid
Achievement: This output has been achieved through a series of trainings that were designed and carried out by the consortium Alcor/AXENNE in 2012. The sequence of trainings was complemented by procedure manuals for the interconnection of a wind farm to the grid, as well as its operation. The procedures include minimum design standards and maintenance requirements for wind equipment. The trainings also covered modules on: economic and financial modeling of a wind farm project, including the calculation of the electricity tariff; use of the WindPRO software to model the operation of a wind farm; and modalities for carrying out accurate wind resources assessments using the WASP software.
Rating: Completed satisfactorily.

Target 7: Study on the identification and choice of wind farm sites.
Achievement: A study has been carried out in 2013 by a consortium led by DFIC and ProfEC to assess the wind resources potential at 5 sites (Zaghouan, Kebili, Medenne, Sfax, Gabes) in Tunisia. Using these assessments, three wind project feasibility studies were carried out at 3 sites including Gabes where the proposed 45MW wind power production has been proposed by the Gabes Cement Company. The project gave support to Valorem (a private wind developer) in selecting a pilot site and performing meteorological measurements required for the installation of a 60 MW wind farm in the region of Thala.
Rating: Completed satisfactorily.

Output 2.2: STEG ability to integrate independent wind electricity production in its grid is strengthened.

Target 8: Documented STEG plan to manage wind injection in network.
Achievement: STEG has been a direct beneficiary of the project under Outcome 2. However, STEG's plan to manage wind injection in the national grid remains undisclosed to third parties. Hence, the project has not been able to document this plan.
Rating: Not completed due to factors not under the control of the project/PMU such as ongoing STEG's resistance.

Output 2.3: Local industry ability to supply equipment and services to wind operators has been improved.

Target 9: 30% of value of equipment and services provided by local firms.
Achievement: This target has not been achieved because no private wind farms have been commissioned during the project lifetime.
Rating: Unsatisfactory.

Target 10: Identifying equipment and services that Tunisian companies could reasonably supply to wind farm operators during the design, construction and operational phases.
Achievement: A study has been completed by E-CUBE in 2013 to identity 120 local companies that could potentially be involved in the value chain of wind power development in Tunisia, mainly in the provision of services such as feasibility studies, logistics, civil engineering, electrical wiring and operation and maintenance. This study also involved a benchmarking exercise in 5 countries, including Germany, France, Portugal,

Denmark and Turkey. The market development conditions in Tunisia were found to be closest to those in Portugal. The study also investigated the job creation potential for three market scenarios (scenario 1 – local market provides on the services already mentioned but no manufacturing capability; scenario 2 – scenario 1 + 50% manufacturing of some components; scenario 3 – scenario 1 + 100% manufacturing of wind technology components + exporting mechanical and electrical systems). It was found that scenario 1 could generate around 400-700 jobs/year, while scenario 3 could generate 2200-2700 jobs/year.
Rating: Completed satisfactorily.

Target 11: Disseminating information about business opportunities related to the government's wind program to Tunisian companies
Achievement: An activity is in due course to publish and disseminate the results of the project.
Rating: Expected to be completed before project closure.

Target 12: Setting up seminars and an electronic forum to bring potential wind concession applicants and Tunisian suppliers together.
Achievement: Not carried out.
Rating: Unsatisfactory.

Target 13: Study and training for NAMA development potential in the renewable electricity sector in Tunisia.
Achievement: This target has been achieved through the technical assistance provided by the consortium composed of Alcor, Wuppertal Institute and Climate Perspectives. This study has paved the way for the development of the new ANME-UNDP-GEF project entitled "NAMA Support for the Tunisian Solar Plan".
Rating: Completed satisfactorily.

4.1.4 Outcome 3: IPP Group is able to launch private wind concession program.

Target 14: 60 MW of wind power installed by IPP
Achievement: No IPP wind power projects have been implemented during the project lifetime.
Rating: Unsatisfactory.

Output 3.1: Concession models for private wind power evaluated, and contractual documents prepared for one or more models

Target 15: One or more concession models have been identified and contractual documents prepared.
Achievement: The framework for private concessions has been investigated for IPPs, auto-production and for the export market, which are the three conditions covered in the RE Law 2014. The models have been proposed based on a baseline study and on international benchmarking. The study was conducted by the firm Mercados in 2011. The study also included a tariff mechanism, as well as permits and administrative requirements for private concessions. For the different types of concessions, the schedules and main

milestones have been identified. However, the contractual documents, including tendering documents and licensing agreements were not completed. It is expected that these outputs will be invaluable in the design and adoption of the decrees that are being developed for the RE Law 2014.
Rating: Completion is moderately satisfactorily.

Output 3.2: Tariff mechanism developed and tariff proposed.

Target 16: Tariff mechanism is clearly identified and STEG avoided cost is calculated.
Achievement: The Mercados study has proposed a methodology for calculating the tariff for private wind energy generation. However, parameters that are applicable have to be used to develop meaningful tariffs for Tunisia. The tariff mechanism allows the assessment of anticipated tariff requirements based on several parameters, including: concession scenarios, range of hypotheses for capital, O&M and cost of capital, and a range of wind farm capacity factors. The Mercados study has also produced accompanying regulatory and administrative documents that would be required to administer the tariff system. It is also pointed out that an economic and financial model for wind-generated electricity has been introduced to project stakeholders during the trainings that have been provided by Alcor/Axenne under Outcome 2. These outputs will benefit the process of developing decrees for RE Law 2014.
Rating: Completed satisfactorily.

4.1.5 Outcome 4: Monitoring and evaluation support provided.

Output 4.1: Project monitoring and evaluation have been conducted.

Target 17:.Reporting and evaluation are conducted accurately and on time.
Achievement:.As discussed in Section 3.4 and summarised in Section 5.3, most of the reporting was conducted accurately but with the changed timelines shown in Section 2.1. The main shortcomings have been the lack of tripartite meetings, and reduded frequency of PSC meetings. Also, AWPs do not seem to have been carried out consistently. No evidence was provided for the submission of Annual Project Reports. At the time of carrying out the final evaluation, a lessons learned study had not been completed according to the planned M&E strategy given in the Project Document. Also, an independent audit has been carried out only once in 2012, while there was provision for carrying one every year.
Rating:.Moderately unsatisfactory.

Target 18: Realization of a documentary on wind energy in Tunisia.
Achievement: According to the 2014 PIR, a documentary on wind energy in Tunisia had been commissioned.
Rating: Satisfactory if completed before project closure.

Target 19: Realization of communication products.
Achievement: According to the 2014 PIR, a TOR for editing and printing the key results of the project had been prepared. However, no evidence was provided during this evaluation concerning the completion of this actvity. Also a website was developed for the project and UNDP has asked the PMU to integrate it under ANME's website to be a platform for all RE or wind energy information sharing.

Rating: Satisfactory if completed before project closure.

Output 4.1: Technical program assistance has been provided to MIEM and ANME

Target 20: The level of technical program assistance is acceptable.
Achievement: Discussions with staff of the PMU, ANME and UNDP (see **Annexes 2** and **3**) has shown that thet level of technical program assistance especially to the ANME has been acceptable. These have included technical capacity building through participation in the quality assurance of technical studies and input to the drafting of the RE Bill. The staff of ANME and the MIEM have also benefited from all the trainings that the project has delivered under Outcome 1 and 2. There were also study tours that have been carried out to Portugal, Morocco, France and Germany and where ANME and PMU were represented each time.
Rating: Satisfactory.

Target 21: Recruitment of a technical-economic consultant to coach the team in the elaboration of ToRs on specified technical subjects.
Achievement: According to the 2014 PIR, a techno-economic consultant was recruited in 2014 to coach the team in the elaboration of ToRs on specific technical subjects. This was a recommendation of the MTR in June 2012 and it would have been more useful to have carried out this activity in the second half of 2012 in order for the PMU to capitalize on the training for the remaining 2 years of the project.
Rating: Moderately satisfactory.

5. Key GEF Performance Parameters

5.1 Sustainability

Based on the analysis of the four sustainability components discussed below, the **overall sustainability** of the project has been rated ***likely***.

The ANME is undertaking several initiatives that will ensure the sustainability of the project. Most notably there is the new ANME-UNDP-GEF project "NAMA Support for the Tunisian Solar Plan" that has built on the outcomes discussed in Section 4. This project seeks to deploy a number of policy de-risking instruments to promote the private investments in order to implement the TSP. It has also identified a number of financial de-risking instruments that the Government of Tunisia can put in place to promote private investments in wind and solar PV electricity generation.

5.1.1 Financial Risks to Sustainability

The financial risks to sustainability can be discussed from two perspectives, namely one related to the continuation of the project activities beyond its lifetime, and the other that is probably more important relates to the capacity of markets to provide capital for investments in wind power generation in Tunisia. Concerning the former, the new ANME-UNDP-GEF project entitled "NAMA Support for the TSP" will provide continuity in the activities of the TWED project.[71] However, there are financial sector and macroeconomic

[71] UNDP (2014). Project Document for project entitled "NAMA Support for the Tunisian Solar Plan".

risks in Tunisia, which is not addressed will continue to hamper private investments in wind power generation.[72] The notable risks are: (1) financial sector risks related to the low liquidity levels existing in the financial sector of Tunisia to provide capital; and (2) macroeconomic and currency exchange risks between the Tunisian dinar and main foreign currencies that is particularly important if investments are made in foreign currencies and that the renewable electricity is denominated in the local currency. This risk category also covers the financial implications of RE investments due to inflation.

5.1.2 Socio-political Risks to Sustainability

After the revolution that took place in January 2011, Tunisia, unlike other middle-eastern States, has witnessed a peaceful transition to democracy between 2011 and 2014. A new government was elected through democratic elections in December 2014. The new government is widely expected to enhance socio-political stability in the country, albeit with a challenging economic reform that needs to be carried out. Socio-political risks remain but are perceived as being unlikely.

5.1.3 Institutional Framework and Governance Risks to Sustainability

After the revolution in January 2011, a new political context emerged in Tunisia with the emergence of new interest groups such as various lobbies at the level of the National Constituent Assembly that supported the views and opinions of such groups as the STEG workers' Union and emerging political parties. As already discussed, the vested interests of these groups did not necessarily favour the promotion of private sector participation in the generation of electricity. Although the Renewable Energy Law 2014 has been proclaimed, its operationalization requires the adoption of specific Decrees. Hence, there is still institutional space for these interest groups to continue that resistance to change. A concrete example is the discussions related to the setting up of an independent energy regulator that is also resisted by STEG. Discussions with project stakeholders have shown that this situation cannot persist given the economic situation of the country that is intricately linked to energy insecurity, the pressure related to a balanced budget because of the unsustainability of energy subsidies, and the financial incapacity of STEG to invest in power generation.

5.1.4 Environmental Risks to Sustainability

There are no foreseeable risks to environmental sustainability. In fact, an awareness of a changing climate in Tunisia as exemplified by Article 45 of the new Constitution is expected to increase the demand for renewable energies, and hence increasing the opportunities for reducing GHG emissions. Article 45 states that"[t]he state guarantees the right to a healthy and balanced environment and the right to participate in the protection of the climate".[73]

5.2 Catalytic Role: Replication and Scaling-up

Given that the project implementation has overlapped with the difficult post-revolution political transition in Tunisia, and given the resistance of STEG to provide political support for the liberalization of the power supply market, the catalytic role of TWED is partial.

[72] UNDP (2014). *Tunisia: Derisking renewable Energy Investment*. New York, NY: United Nations Development Programme.

[73] The Constitution of the Republic of Tunisia can be found at: http://www.constitutionnet.org/files/2014.01.26_-_final_constitution_english_idea_final.pdf - accessed 28 February 2015.

Nevertheless, it has built the foundation for private investment in renewable energies to take place, especially through other initiatives like "NAMA Support to the TSP" that is being implemented by the ANME.

5.3 Monitoring and Evaluation

The PMU has provided considerable effort concerning M&E of the project. The PMU was reinforced with 3 engineers and one Project Assistant in 2010. After around a year of implementation one of the engineers left the project and Project Assistant joined the ANME. The project had opted not to replace the engineer and the Assistant. Nevertheless, the Project Assistant continued to work on the project. However, M&E could have been better in terms of quality and frequency in order to enhance the results of the project and to identify problems to solve in time – i.e. provide a better adaptive management. The risks of the project were not updated regularly, which reflects the fact that the PSC did not provide political support to the project beyond acting like a technical advisory committee (Section 3.4). The PIR was almost the only opportunity to do so. These situations encumbered UNDP to engage in the micro management of the project at times in order to progress certain activities or ensuring a better quality of reporting.

The PMU developed short project progress overviews that were presented to the PSC. However, these did not take the form of UNDP Quarterly Progress Reports (QPRs) or GEF Quarterly Operational Reports (QORs). Annual Progress Reports (APRs) were also not carried out. Project Implementation Reviews (PIRs) were submitted to GEF every year.

It should be noted that the project did not hold any tripartite meetings over the lifetime of the project, and it should be noted that the involvement of the GEF Operational Focal Point (OFP) in the project remained very distant until end of 2012. The GEF OFP was invited to join the PSC upon repeated requests from UNDP.

5.4 Project Impacts and Global Environmental Benefits

Being at the terminal stage, it is clear that the project will not be able to deliver on its goal of reducing CO_2 energy related emissions through the commissioning of 100MW of grid-connected wind power by the private sector (of which 60MW will be supported directly by the project). Given the context in which the project has operated (see sections 3.9 and 4.1.1), it would be unfair to dismiss the project as having had no developmental impacts. First it must be recognized that there were design flaws in the project. For instance, the results framework did not differentiate between the different stages of a wind project development and the successful outcome of these stages that is the tangible investments in wind energy infrastructure. Given the situation of monopoly prevailing in the power sector when the project was designed, and given the unfavorable policy and regulatory frameworks, the focus on investments was not appropriate. In short, the project was too ambitious to produce the required project impacts and global environmental benefits.

Besides being too ambitious, the emission reduction targets were elaborated without sufficient clarity as to how the regulatory work would be sequenced with the wind farm investments. Further, the calculation of direct emission reductions did not follow the appropriate method for a GEF-funded RE project. For instance, there should be no direct GHG emission reductions during the project period. There should be only lifetime direct

emission reductions from investments facilitated during the project period. And, there are no post-project direct emissions, since these only apply to projects with financial mechanisms. So the entire emission reduction targets given in the project document were not elaborated correctly and as per the GHG handbook.

With these qualifications in mind, the project is recognized by stakeholders (see **Annex 3** for stakeholders' responses) to have played a critical role in paving the way for power sector reforms that will accommodate private sector participation in power generation in Tunisia. A most notable contribution of the project has been the proclamation of the Renewable Energy Law in 2014 that makes provision under Section 5 for private sector generation of renewable electricity in three forms: (1) self-consumption, (2) sale exclusively and entirely to the public structure, which commits to buy, and (3) export.[74] The Renewable Energy (RE) Law 2014 is yet to be operationalized through Decrees. Nevertheless, by proclaiming the RE Law 2014, the National Constituency Assembly sent a strong signal regarding the willingness of government to address market imperfections and inefficiencies in power generation. The government took the opportunity to communicate that the proclamation of the RE Law 2014 will not imply the privatization of STEG, and that the national utility will continue to hold a monopoly over electricity transport and distribution.[75] As discussed in Section 4.1, the project has also delivered a FiT mechanism for renewables and concession models for wind energy that will directly support the development of the Decrees to operationalize the RE Law 2014.

In order to estimate the indirect emission reduction the grid emission factor has been calculated for the Tunisian electricity system as shown in **Annex 8** using the CDM methodological tool. The grid emission factor has been calculated as 0.5298 tCO_{2e}/MWh. This emission factor is lower than the value of 0.604 tCO_{2e}/MWh that was used during project formulation, and reflects well changes in the build margin that have taken place since the ANME-UNDP-GEF project was designed over a decade ago. The top-down and bottom-up approaches have been used to estimate the indirect emission reductions that may accrue from the closed project. The initial project design had assumed that indirect emissions of the order of 7.3 $MtCO_{2e}$ over 20 years[76] would result from the addition of 200 MW new private sector wind capacity installations.[77] It is pointed out that this assumption was made prior to the development of the Tunisian Solar Plan (TSP) discussed in Section 2.2.1.3.

Top-down approach

The top-down approach uses the targets proposed in the TSP (see **Table 6** in Section 2.2.1.3) as a starting point. Two conservative assumptions have been made to calculate the

[74] Law Concerning the Production of Electricity from Renewable Energy 2014. A copy of the Law was made available by Ms Jihene Touil, UNDP.

[75] Please see: http://www.ansamed.info/ansamed/en/news/sections/energy/2014/09/22/tunisia-renewable-energy-new-law-opens-market_ab0ead5b-7b58-43a6-b298-ecb548021c18.html; and http://www.photon.info/photon_news_detail_en.photon?id=88423 – accessed 23 February 2015.

[76] Assuming that the project was expected to close around mid-2012, the timeframe for estimating the indirect emission reductions would be mid-2032. This is very close to the timeframe of 2030 proposed in the TSP.

[77] In the Project Document, it was assumed that the 200MW of additional wind capacity will generate 12,400 GWh of electricity each year. Calculations carried out by the international consultant has shown that for cumulative indirect emission reduction of 7.3 $MtCO_{2e}$, the annual electricity generation should be 604.44 GWh/year using a capacity factor, CF = 34.5% and an emission factor of 604 tCO_2/GWh.

indirect emission reductions, namely that (1) wind energy comprises 50% of total renewable[78], and (2) the increase in RE generation proceeds linearly between 2016 and 2020, and between 2020 and 2030. Using these assumptions and a grid emission factor equal to 0.5298 tCO_{2e}/MWh (see **Annex 7**), the cumulative emission reductions between 2016 and 2030 is approximately 18.8 $MtCO_{2e}$. In order to be conservative, a weak causality factor of 20% has been applied to give cumulative indirect top-down emissions reductions of ~3.8$MtCO_2$.

Bottom-up approach
The bottom-up approach uses the post-project 15-year market potential as the starting point. The 15-year timeframe has been adopted here to be in alignment with the TSP. Since the UNDP-implemented, GEF-financed project has terminated at the end of 2014, the 15 year market potential coincides with the emissions reductions expected between 2015 and 2030. The Energy Mix study completed in 2013 has calculated the cumulative GHG emissions reductions that are expected from the TSP between 2013 and 2020 (5.8 MtCO2), and between 2013 and 2030 (32.5 $MtCO_2$).[79] Given that no utility-scale wind and solar PV projects have been implemented in 2013 and 2014, an assumption has been made here to adjust the 2013 baseline to the year 2015 without changing the installed capacities discussed in Section 2.2.1.3. Using these figures, the 15-year cumulative emissions reductions potential is assumed to be 32.5 $MtCO_2$. In order to be conservative, a weak causality factor of 20% and a contribution of 50% emission reduction from wind energy give the cumulative indirect emissions reductions of around 3.1$MtCO_2$.

The top-down and bottom-up approaches give fairly commensurate indirect emission reductions in the range 3.1 to 3.8 $MtCO_2$.

6. Main Lessons Learned and Recommendations

6.1 Lessons from the Experience of the Project

There are a few key lessons that have been derived from the TWED project and which should be captured as lessons learned.

- Project design: The project was designed to be implemented over a period of 3 years and the actual implementation period was effectively 6 years. Notwithstanding the project extension, the main objective to generate direct emission reductions through 60MW of private sector wind installations was not achieved. The context in which the project was developed was characterized by a situation of quasi-monopoly of power generation, transmission and distribution, and sales of electricity by STEG. To compound the problem, it should be noted that the total lead time for an onshore utility-scale wind installation may exceed 2 years.[80] Further, there was no favorable policy and regulatory frameworks in place to support private investments in

[78] This is derived from the fact that wind energy will contribute 15% of the 30% of renewable electricity produced in 2030 according to the TSP.
[79] ANME (2013), *Stratégie Nationale du Mix Energétique pour la Production Electrique aux Horizons 2020 et 2030: Choix, Impacts et Conditions d'Opérationnalisation*, Ministère de l'Industrie, Tunis. pp. 22-27.
[80] http://www.windbarriers.eu/fileadmin/WB_docs/documents/WindBarriers_report.pdf - accessed 27 February 2015.

renewable energies. Given these conditions, it is observed that the target for achieving 60MW of private sector wind power generation was unrealistic or too ambitious. There was an opportunity to review this target at the half-way mark but that was not carried out. The TWED project has shown that caution much be applied in the design of similar projects where similar contexts as in Tunisia prevail.

While it was unrealistic to go from a situation of having no wind investments and private sector participation in renewable energy to 60 MW of commissioned wind farms, and all the policy and regulatory work in 3 years, a phased approach to put in place the essential building blocks of wind energy development gradually and in sequence may have been a better alternative. For instance, an alternative project could have focused on wind energy resources mapping, capacity-building of all the key stakeholders, the development of procurement mechanisms, and the facilitation of one demonstration wind farm supported with an Energy Purchase Agreement mechanism. Such a project would then have paved the way for larger wind investments.

Besides being too ambitious, the emission reduction targets were elaborated without sufficient clarity as to how the regulatory work would be sequenced with the wind farm investments. Further, the calculation of direct emission reductions did not follow the appropriate method for a GEF-funded RE project. For instance, there should be no direct GHG emission reductions during the project period. There should be only lifetime direct emission reductions from investments facilitated during the project period. And, there are no post-project direct emissions, since these only apply to projects with financial mechanisms. So the entire emission reduction targets given in the project document were not elaborated correctly and as per the GHG handbook.

- Usefulness of the strategic results framework: Since the results framework is the cornerstone tool that defines the project, and it is also the tool that is used for planning project implementation and for carrying out monitoring and evaluation of the project, the quality of its design will automatically reflect the impacts that the project will yield. This evaluation has shown that there were serious design flaws in the results framework (and the project document) that also capture the over ambitious or unrealistic investment targets and the corresponding direct GHG emission reductions that the GEF-financed project was expected to deliver. There were design flaws in the project document and results framework that have made the evaluation of impacts difficult. Some examples are:

  Several of the indicators are poorly defined and may not be well connected to the targets that the project sought to achieve. Some examples are:
  - *Poorly defined indicators*: One indicator is the 'issuance of private wind concessions' but there is no formal definition of what would constitute a private wind concession. Another example is the lack of definition of 'private sector wind power investments'. For instance, does wind power investments cover all investments that a private promoter would carry out prior to the capital investments in an actual wind farm and grid interconnection, such as wind

energy resources assessments, interconnection studies and micro-siting of wind turbines? Or would 'investments' cover the actual capital investment in wind farm hardware and grid interconnection? These are important because they directly influence the way in which the impact of the project on direct global environmental benefits are calculated. For instance, if a wind project has been authorized by the Ministry of Industry to be installed under the auto-production law, such as the 45 MW wind farm project at the Gabes cement factory, and if that authorisation was considered to be a 'private wind concession', then the project could be counted as delivering direct GHG emission reductions even when installed outside the project lifetime.[81] In this example, it is also not clear whether the 'authorization from the Ministry of Industry' would constitute the 'issuance of private wind concessions'?

- *Disconnection between objectives, targets and indicators*: The project objective mention incentives will be provided for wind developers, and yet there is no incentive as an indicator or target. The only incentive is arguably the FiT that has been developed under Outcome 3 (output 3.2). Also, the project objective mentions a strategy for issuing tenders and yet there is only mention of concessions (Outcome 3 – output 3.1) and no clarity about the procurement process or interim steps; and
- *Tenuous linkages between outcomes, targets and indicators*: There are also examples where targets and indicators do not necessarily reflect an outcome. For instance, Outcome 1 seeks to establish an enabling regulatory and institutional framework in support of on-grid renewables. The indicator of this outcome 'strengthened commitment of government to push through a program of private sector on-grid wind power' is rather vague since it does not indicate any objectively verifiable metric to measure 'commitment of government'. Also, 'Government documents on wind energy' is not a target but rather a 'source of verification'.

  Similarly for Outcome 3, the indicator 'increased participation by private developers' and the target '60 MW of Wind Power installed by IPP' are not necessarily linked to the *ability* of the IPP Group to launch private wind concessions. Here, the result of launching the private wind concessions may be a 60 MW installed wind energy capacity, but this result says little about the ability of the IPP Group to launch a concession. This is also an example of where the process of launching a private wind concession that follows a sequence of activities is either not well understood or not clearly spelled out. Further scrutiny reveals that the 'increased participation by private developers' may be defined in ways, such as participation in project trainings and receiving the authorization to install 45 MW wind capacity under the auto-production law, other than in the capital investment in 60 MW wind farms.

[81] This example is noted in the 2014 PIR. However, discussions with Mr Ghodhbani, Gabes Cement Company carried out in the context of this evaluation have revealed that the chances of implementing the 45 MW wind farm under the auto-production Law are very low. Also, it should be noted that the 45 MW wind energy project at Gabes is also a baseline project in the ANME-UNDP-GEF project entitled 'NAMA Support for the Tunisian Solar Plan'. In order to avoid double counting, the calculations of global environmental benefits in Section 5.4 have not considered the Gabes wind farm project.

While the project has been adaptive in reformulating the results framework, it has not fully capitalized on its usefulness as a tool for the proper implementation and monitoring and evaluation of the project. The main lesson learned is the need to also cover the outputs of the project in the results framework.

- Catalytic effect: Given that the project implementation has overlapped with the difficult post-revolution political transition in Tunisia, and given the resistance of STEG to provide political support for the liberalization of the power supply market, the catalytic role of TWED has been partial. Nevertheless, it has built the foundation for private investment in renewable energies to take place, especially through other initiatives like "NAMA Support to the TSP" that is being implemented by the ANME. This shows that Outcomes 1, 2 and 3 are essential elements for the removal of barriers and that the corresponding outputs can be effective policy de-risking instruments to promote private investments in wind energy (and more broadly in Renewable Energy).

- Adaptive management: There is evidence that the project has not been able to adapt to the main challenge it faced, that is resistance from STEG for politically supporting private generation of on-grid electricity from wind power. This has been highlighted by the inability of the project to establish a Strategic Committee as proposed by the MTR in order to provide political support to the project and to provide a space for discussing institutional differences, especially those resulting in STEG resistance. The lack of an adaptive management approach resulted in the PSC acting effectively as a technical advisory committee to provide quality assurance on the project deliverables. It would have been useful for TWED to develop a strategy to tackle the issue of STEG resistance at the beginning of the project implementation. A sound approach would have been to acknowledge the problem but to see it as an opportunity to develop a strategic partnership with STEG in order to provide a healthy platform to deal with any issues related to this resistance. This would have been especially meaningful given the fact that the resistance from STEG to support private sector involvement in renewable energy generation was not assessed in sufficient depth during project design. Further, there were more openings for the participation of civil society in the political affairs of the country after the revolution that took place early in 2011. During the project design, civil society was not recognized as a key stakeholder of the project. Since local communities are central to the social acceptability of wind energy, the project missed an opportunity for engaging civil society organizations in the aftermath of the revolution in order to promote wind energy. Engagement with the civil society would have been a means to also promote the Renewable Energy Bill and its sensitization in the regions.

6.2 Final Evaluation Ratings

Evaluation ratings for project component or objectives with qualitative summary.

Project Component or Objective	Rating	Qualitative Summary
Project Formulation		

Project Component or Objective	Rating	Qualitative Summary
Relevance	R	Relevant at national and regional levels and GEF levels – the project is squarely aligned with the energy priorities of Tunisia, as well as the climate change mitigation priorities of GEF.
Conceptualization / design	MU	The project document meets all the relevant minimum standards, and the project strategy is appropriate for the context in which the project is operating. The problem statement was well articulated and based on baseline studies. The major flaw was the lack of attention paid to the unrealistic goal of obtaining direct emission reductions from the commissioning of 60MW of private wind installations given the situation of monopoly by the public utility and the lead time that may be in excess of 2 years to implement onshore wind projects. The design and conceptualization failed to identify an appropriate strategy to deal with the resistance of STEG and also to identify specific private sector stakeholders to form part of the PSC.
Stakeholder participation	MS	Coordination of stakeholders has been a strength of the project, especially concerning the delivery of trainings and capacity building on wind power development, and the stakeholder engagements that were carried out during the design, evaluation and approval of the new RE Law 2014. However, there were also shortcomings related to the more direct involvement of the private sector on the PSC, as well as the participation of CSO/NGO and other public institutions. The project concept originated indigenously from ANME, and the project development phase included inputs from relevant national institutions and organizations. The Ministry of Regional Development and Planning was roped in during the second half of the project in order to integrate the sustainable development of the regions using renewable energies in the TSP.
Project Implementation		
Implementation Approach (Efficiency)	MS	TWED adopted a support to NIM modality for project execution, there were delays in procurement cycles, and payment processes from both ANME and UNDP. At the end of December 2014, project expenses amount to ~84% of total GEF funding.
The use of the logical framework	MS	The project team should have made better use of the results framework as an implementation and M&E tool as well. This is after the PMU was provided with

Project Component or Objective	Rating	Qualitative Summary
		project management training by UNDP at the beginning of the project
Adaptive management	MS	The project showed many instances of the lack of adaptability and flexibility that may have perpetuated the political risks arising from the resistance from STEG.
Operational relationships between the institutions involved	S	The main issue has been the lack of political guidance from the PSC to steer the project effectively. The PSC has operated more like a technical advisory committee that has provided quality assurance for project deliverables. The PSC did not serve as a forum to making strategic decisions to reorient the project when challenges surfaced or lingered such as the ongoing STEG resistance to change.
Financial management	MS	At the end of 2014, the project had spent 83.2% of all GEF funding. The analysis was based on CDRs that were made available by the PMU and UNDP. Because of the lack of documentary evidence such as the 2014 AWP and any budget revisions, it was not possible to ascertain how and when the remaining 16.8% of GEF funding will be utilized. Only one independent financial audit was completed in 2012 (for 2011 expenditures) and it found no irregularities based on UNDP and GoT fiduciary benchmarks.
Monitoring and Evaluation	**MS**	**Overall, M&E is considered moderately satisfactory, though the log-frame indicator design, a critical element, could have been put to better use. For instance, there are no indicators and means of verification for activities in the results framework.**
Monitoring and evaluation design	MU	The main M&E activities planned meet GEF and UNDP minimum standards, and conform to UNDP-GEF standard practices. The project log-frame indicators and targets in general do not conform to SMART criteria. While this is a result of the project conceptualisation and design, it is pointed out that the project logical framework could have been revised either during the Inception stage or at the MTR. These opportunities were not taken to redesign the project logical framework.
Monitoring and evaluation implementation	MS	The situation with respect to project auditing should be clarified and documented in PSC meeting minutes. The PSC should meet more regularly to provide better quality assurance for more effective and efficient project delivery. Also, the PSC acted like a quality

Project Component or Objective	Rating	Qualitative Summary
		assurer for the technical quality of deliverables rather than providing project oversight and political support for the project. Several recommendations of the MTR were not implemented.
Monitoring and evaluation budgeting	S	Resources necessary for project M&E activities are fully budgeted at adequate levels.
Stakeholder Participation	**MS**	**Although stakeholder engagement was a strength of the project, the participation of some key institutions in the decision-making instance was lacking.**
Production and dissemination of information	MS	This has been reported (even by the PMU) as being another weakness of the project. The project has not received a lot of visibility and its website is not fully operational. The project would have benefited from a Communications Strategy and a follow up of the website should have been done better, especially that it was supposed to be done by one of the staff of PMU.
Establishment of partnerships	MS	Overall, the project implementation approach represents an important partnership between key government institutions. Beyond this, the project has supported the private sector but could have enhanced private sector partnerships by involving the private sector in the PSC. Partnerships with CSOs/NGOs may have been enhanced as well.
Involvement and support of governmental institutions	S	Apart from the resistance of STEG that is the public utility, the project has received the support of governmental institutions.
Project Results	**MS**	
Progress Toward Achievement of Objective and Outcomes (Effectiveness)	MS	The significant outputs (i.e. those that are expected to have impacts beyond the lifetime of the project) of the project have been reached, with the notable exception of the achievement of its development goal and objective..
Objective: The goal of the project is to reduce Tunisia's overall energy-related CO_2 emissions in a cost-effective way while helping stabilize energy costs through greater diversification of energy sources.	MU	No direct GHG emission reduction has taken place during the lifetime of the project. Cumulative indirect GHG emission reductions have been calculated at between ~3.1-3.8 $MtCO_{2e}$ over a 15-year post-project duration; which is around half of with the value of 7.30 $MtCO_{2e}$ that was expected during the design stage and is stated in the Project Document.
Outcome 1: Enabling	S	The project has supported the design and revision of

Project Component or Objective	Rating	Qualitative Summary
regulatory and institutional framework has been established in support of on-grid renewable energy.		the Renewable Energy Bill that was approved and proclaimed by the National Constituency Assembly in 2014. Outcome 1 has been the most successful component of the project.
Outcome 2: Technical and organizational capabilities of key stakeholders have been strengthened.	MS	The project has carried out a good job of providing training to its main stakeholders, and it is to be noted that more than 50% of the beneficiaries were from the private sector. However, since no wind power project has materialised, the impact of these trainings has remained weak. Further, the local industry has not developed a value chain for wind technology as was targeted by the project.
Outcome 3: IPP Group is able to launch private wind concession programme.	MS	Although the IPP Group has received technical support from the project, it cannot be said that it is able today to launch a private wind concession programme. Concessions models and associated tendering documents were finalised. Also, the Decrees that will be needed to operationalise the RE Law 2014, including supporting private power generation through a process of tendering, are yet to be approved.
Outcome 4: Monitoring and evaluation support provided	MS	The M&E of the project has been good overall. However, the were issues such as the more decisive role of the PSC to provide political guidance and support for the project were found to be lacking despite recommendations to redress the situation was proposed in the MTR. The development of AWPs, reporting and adaptive management of the project could have been improved.
Sustainability	L	Based on the assessment of four components of sustainability, the activities and impacts of the project beyond its lifetime are assessed positively.
Financial sustainability	L	The ANME is undertaking several initiatives that will ensure the sustainability of the project. Most notably there is the new ANME-UNDP-GEF project "NAMA Support for the Tunisian Solar Plan" that has built on the outcomes discussed in Section 4. This project seeks to deploy a number of policy de-risking instruments to promote the private investments in order to implement the TSP. It has also identified a number of financial de-risking instruments that the Government of Tunisia can put in place to promote private investments in wind and solar PV electricity generation.

Project Component or Objective	Rating	Qualitative Summary
Socio-political sustainability	L	After the revolution that took place in January 2011, Tunisia, unlike other middle-eastern States, has witnessed a peaceful transition to democracy between 2011 and 2014. A new government was elected through democratic elections in December 2014. The new government is widely expected to enhance socio-political stability in the country, albeit with a challenging economic reform that needs to be carried out. Socio-political risks remain but are perceived as being unlikely.
Institutional and governance sustainability	L	After the revolution in January 2011, a new political context emerged in Tunisia with the emergence of new interest groups such as various lobbies at the level of the National Constituent Assembly that supported the views and opinions of such groups as the STEG workers' Union and emerging political parties. The vested interests of these groups did not necessarily favour the promotion of private sector participation in the generation of electricity. However, this situation cannot persist given the economic situation of the country that is intricately linked to energy insecurity, the pressure related to a balanced budget because of the unsustainability of energy subsidies, and the financial incapacity of STEG to invest in power generation.
Environmental sustainability	L	There are no risks to environmental sustainability. In fact, an awareness of a changing climate in Tunisia (as exemplified by the incorporation of an article to decisively address climate change and its impacts in the new Constitution) is expected to increase the demand for renewable energies, and hence increasing the opportunities for reducing GHG emissions.
Progress toward Overall Project Achievement and Impact	**MS**	

Summary of evaluation rating in TE format.

Evaluation Ratings:			
1. Monitoring and Evaluation	***rating***	**2. IA& EA Execution**	***rating***
M&E design at entry	MU	Quality of UNDP Implementation	S
M&E Plan Implementation	MS	Quality of Execution - Executing Agency	S
Overall quality of M&E	MS	Overall quality of Implementation / Execution	S

3. Assessment of Outcomes	rating	4. Sustainability	rating
Relevance	R	Financial resources:	L
Effectiveness	MS	Socio-political:	L
Efficiency	MS	Institutional framework and governance:	L
Overall Project Outcome Rating	MS	Environmental :	L
		Overall likelihood of sustainability:	L

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Annex 1 – TOR for the Final Evaluation

I. INTRODUCTION

UNDP-GEF M&E Policy

UNDP-GEF's M&E policy is available on-line at: http://www.undp.org/gef/05/monitoring/policies.html. In accordance with the policy, all projects are encouraged to conduct final evaluations. In addition to providing an independent in-depth review of implementation progress, this type of evaluation is responsive to GEF Council decisions on transparency and better access of information during implementation.

The Monitoring and Evaluation (M&E) policy at the project level in UNDP/GEF has four objectives:

i) **to monitor and evaluate results and impacts;**
ii) **to provide a basis for decision making on necessary amendments and improvements;**
iii) **to promote accountability for resource use;**
iv) **to document, provide feedback on, and disseminate lessons learned. A mix of tools is used to ensure effective project M&E. These might be applied continuously throughout the lifetime of the project – e.g. periodic monitoring of indicators -, or as specific time-bound exercises such as final reviews, audit reports and independent evaluations.**

Final evaluations are intended to identify project results, assess progress regarding final objectives, document lessons learned (including lessons that might improve design and implementation of other UNDP/GEF projects), and to make recommendations regarding specific actions that might be taken to improve final results and products of the project. It is expected to serve as a means of validating or filling the gaps in the initial assessment of relevance, effectiveness and efficiency obtained from monitoring.

THE PRIVATE SECTOR LED DEVELOPMENT OF ON-GRID WIND POWER IN TUNISIA PROJECT

The Private Sector Led Development of On-grid Wind Power in Tunisia project aims at promoting on-grid wind power in Tunisia through the introduction of the necessary regulatory and institutional framework to create favourable conditions for private sector investors in the renewable energy sector. A secondary objective is to assist the government of Tunisia in launching a program of private wind concessions totalling 100 MW. In order to achieve those objectives, the project strategic framework in the original project document outlined that four outcomes would be achieved: (1)establishing a regulatory and institutional framework that is conducive to on-grid renewables, including a power sector arbitration mechanism; (2),strengthening the technical and organizational capabilities of key stakeholders, including ANME (the RE/EE agency), STEG (the Transmission System Operator) and local Tunisian companies; (3) providing technical assistance to the IPP

Bureau in evaluating concession models and developing a tariff settlement mechanism; and (4)providing project monitoring and evaluation support.

It is a $2 million project funded by the global environment Facility (GEF), the United Nations Development Programme (UNDP) and the Government of Tunisia: cash and in-kind contributions. The National Agency for Energy Conservation (ANME) is the executing Agency. A Steering Committee (SC) was created upon signature of the project document. The terms of reference (TOR) for the SC were drafted and the first meeting was held in July 2009. Furthermore, a round table conference was organised in December 2009, where all the stakeholders were actively involved. They expressed their needs for capacity building and also gave recommendations related to the project outcomes in order to ensure its success. In addition, based on the steering committee recommendation, the situation analysis of the project was updated and disseminated to the steering committee members, in order to take into account all the measures adopted by Tunisian Government regarding renewable energy since the approval of the project by the GEF in 2007.

The project document was signed in July 2009 for an initial duration of three years. And The Project Management Unit (PMU) started working officially in February 2010. The project was extended until December 2013 further to the mid-term evaluation. The operational extension extended until September 2014 in order to finalize on-going activities in order to disseminate the project results, and conduct the final evaluation.

Expected Project Results

The progress towards the achievement of the project's objectives is to be measured against the project logical framework, which was itself revised and updated following the project's Mid-Term Evaluation.

2. EVALUATION AUDIENCE

This Final Evaluation is initiated by UNDP as the GEF Implementing Agency. It aims to provide stakeholders, including the National Agency for Energy Conservation and UNDP, with an objective, independent assessment of the project's performance and to provide the basis for learning and accountability.

3. OBJECTIVES OF THE FINAL EVALUATION

The Final Evaluation serves as an agent of change and plays a critical role in supporting accountability. Its main objectives are:

1. To assess the lessons-learned from the project and its effects regarding the development of the wind sector.
2. To measure accountability for the achievement of the GEF objective.
3. To enhance organizational and development learning.
4. To enable informed decision-making.

4. SCOPE OF THE EVALUATION

The scope of the evaluation will cover:

- All components of the GEF-funded project.

- The co-financed components, such as the UNDP TRAC, Government cost-sharing fund, and the in-kind contributions from the Government, which have been included in the project document.
- The final lessons-learned and achievements with regards to project design, implementation and management.

The Final Evaluation will cover the following aspects:

I. Progress towards Results
- ***Changes in development conditions****:*

Assess the progress towards the following:

- Has there been any change during the project period? Has there been any enhanced engagement by the Government to promote a program of private wind energy concession together with the new renewable law?
- How has the broader context evolved to affect the project in achieving its stated objective, both positively (i.e. changes supportive of the project's objectives), or negatively (i.e. changes in the broader context that generate constraints to achieve the project's objectives)?

- ***Measurement of change****:* Progress towards results should be based on a comparison of indicators before and after the project's achievement. Progress can also be assessed by measuring, inter alia, the changes in the regulatory and institutional frameworks for self-production and private power generation concession, and the benefits of the technical assistance and training provided by the project.

- ***Project strategy*****:** how and why outcomes (listed as outputs) in the project document, result log-frame, and strategies contribute to the achievement of all expected results:
- Examine their relevance and whether they provided the most effective route towards future results (development of wind and renewable concessions).
- Assess adequacy of the revised log-frame and indicators in responding to the GEF strategic priorities and achieving the project objective.
- Assess if the logical framework, indicators and baseline developed during the inception phase and outlined in the 2010-2013 PIRs represented the best project strategy for monitoring and measuring the progress.

- ***Sustainability*****:** assess the extent to which the benefits of the project will be sustained, within or outside the project domain, after it has come to an end. Relevant factors include, for example: development of a sustainability strategy, establishment of financial and economic instruments and mechanisms, mainstreaming project objectives into the economy or community production activities.

- ***Gender perspective***: Extent to which the project accounts for gender differences when developing and applying project interventions. How were gender considerations mainstreamed into project interventions and how could this approach have been strengthened.

II. Project's Adaptive Management Framework

(a) Monitoring Systems

- Assess the monitoring tools used:
  - Did they provide the necessary information?
  - Did they involve key partners?
  - Were they efficient?
  - Were additional tools required?

- Reconstruct baseline data if necessary. Reconstruction should follow participatory processes and can be achieved in conjunction with a learning exercise.

- Ensure the monitoring system, including performance indicators, at least met GEF minimum requirements.[82]

- Complete the GEF Tracking Tool and provide an assessment of the GHG mitigation performance of the project, relative to expectations (as described in the Project Document and the Mid-Term Review) and relative to similar projects elsewhere.

(b) Risk Management

- Validate whether the risks identified in the project document and PIRs were indeed the most important and whether the risk ratings applied were appropriate. If not, explain why. Describe any additional risks identified and suggest risk ratings and possible risk management strategies that the project could/should have adopted.

- Assess the project's risk identification and management systems:
  - Was the UNDP-GEF Risk Management System[83] appropriately applied (with particular emphasis on the financial risks related to micro-grants)?
  - Were risks adequately internalized into the project strategy? If not, how could the UNDP-GEF Risk Management System have been used to strengthen project management?

(c) Work Planning

- Assess the use of the logical framework as a management tool during implementation and any changes made to it
  - Ensure the logical framework met UNDP-GEF requirements in terms of format and content
  - What impact did the retro-fitting of impact indicators have on project management?
  - Assess the use of routinely updated work plans. Were they used to respond to the revised logical framework?

- Assess the use of electronic information technologies to support implementation, participation and monitoring, as well as other project activities

- Were work-planning processes result-based? If not, suggest ways that work planning could/should have been re-orientated.

[82] See section 3.2 of the GEF's "Monitoring and Evaluation Policies and Procedures", available at http://www.undp.org/gef/05/monitoring/policies.html.

[83] UNDP-GEF's system is based on the Atlas Risk Module. See the UNDP-GEF Risk Management Strategy resource kit, available as Annex XI at http://www.undp.org/gef/05/monitoring/policies.html.

- Consider the financial management of the project, with specific reference to the cost-effectiveness of interventions. Any irregularities must be noted.

(d) Reporting

- Assess how adaptive management changes were reported by the project management.
- Assess how lessons derived from the adaptive management process have been documented, shared with key partners and internalized by partners.

Underlying Factors
- Assess the underlying factors beyond the project's immediate control that influenced outcomes and results. Consider the appropriateness and effectiveness of the project's management strategies for these factors.
- Test the assumptions made by the project management.
- Evaluate the final results of the project and examine its impacts on the sector, partnerships, etc.
- Assess the effect of any incorrect assumptions made by the project.

UNDP Contribution
- Assess the role of UNDP against the requirements set out in the UNDP Handbook on Monitoring and Evaluating for Results. Consider:
  - Field visits
  - Steering committee/TOR follow-up and analysis
  - PIR preparation and follow-up
  - Combined Delivery Report
  - Quarterly Progress and Financial Report
  - GEF guidance

- Consider the new UNDP requirements outlined in the UNDP User Guide, especially the Project Assurance role, and ensure they are incorporated into the project's adaptive management framework.
- Assess the contribution to the project from UNDP "soft" assistance (i.e. policy advice & dialogue, advocacy, coordination, use of knowledge products and worldwide experience to the benefit of the project) looking specifically at linkages and synergies with other UNDP practice areas (e.g. governance, gender, poverty, etc.). Suggest measures to strengthen UNDP's soft assistance to the project management.

Partnership Strategy
- Assess how partners were involved in the project's adaptive management framework:
  - Involving partners and stakeholders in the selection of indicators and other measures of performance
  - Using already existing data and statistics
  - Analysing progress towards results and determining project strategies.
- Assess how local stakeholders participated in project management and decision-making. Include an analysis of the strengths and weaknesses of the approach adopted by the project and suggestions for improvement if necessary.
- Consider the dissemination of project information to partners and stakeholders.

Project finance / co-finance

The Evaluation will assess the key financial aspects of the project, including the extent of co-financing planned and realized. Project cost and funding data will be required, including annual expenditures. Variances between planned and actual expenditures will need to be assessed and explained. Results from recent financial audits, as available, should be taken into consideration. The evaluator(s) will receive assistance from the Country Office (CO) and Project Team to obtain financial data in order to complete the co-financing table below, which will be included in the terminal evaluation report.

Co-financing (type/source)	UNDP own financing (mill. US$)		Government (mill. US$)		Partner Agency (mill. US$)		Total (mill. US$)	
	Planned	Actual	Planned	Actual	Planned	Actual	Actual	Actual
Grants								
Loans/Concessions								
• In-kind support								
• Other								
Totals								

Annex 2 – Evaluation Questionnaire for Survey Among Stakeholders

Questionnaire for the Final Evaluation

The Private Sector Led development of On-grid Wind Power in Tunisia Project

by

Prakash (Sanju) Deenapanray, International Consultant

Explanatory note

As a key stakeholder to the above project, you are most probably aware that the project is undergoing an independent review. It is standard procedure to carry out Final Evaluation as per standard UNDP/GEF Monitoring and Evaluation Policies and Guidelines.[84] There are four objectives to this independent review, namely:

1. Monitor and evaluate results and impacts;
2. Provide a basis for decision making on necessary amendments and improvements;
3. Promote accountability for resource use (although this exercise is not a Financial Audit);
4. Document, provide feedback on, and disseminate lessons learned.

Although you are encouraged to identify yourself, please note that you have the right to anonymity. In the event that you wish to remain anonymous, do however indicate the stakeholder group or institution that you belong to.

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PART A - Details of Interviewee

Name of person:

Affiliation (name of institution):

Address:

You or your institution's involvement with the project:

Stages of involvement the PROGRAMME: Design; Formulation; Implementation; Monitoring & Evaluation; Other (please state) – **Please *tick* as appropriate**.

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PART B - General Questions (to be answered by all key stakeholders)

1. Please provide your general feedback on the following components of the project using the following ratings: Highly Satisfactory, Satisfactory, Marginally Satisfactory, Unsatisfactory, or N/A. You should use one rating per component.
   Briefly justify your response (where applicable).

Relevance – The extent to which the project is suited to local and national development priorities and organizational policies, including changes over time;

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[84] Guidelines for GEF Agencies in Conducting Final Evaluations, Evaluation Document No. 3 (Global Environment Facility, Evaluation Office, 2008); and The GEF Monitoring and Evaluation Policy, Evaluation Document No. 1 (Global Environment Facility, Evaluation Office, 2006) – both documents accessed at http://thegef.org - 12 July 2010.

Effectiveness – The extent to which an objective has been achieved or how likely it is to be achieved;

Efficiency – The extent to which results have been delivered with the least costly resources possible (while noting that this evaluation is not a financial audit);

Results – The positive and negative, and foreseen and unforeseen, changes to and effects produced by a development intervention. These include direct project outputs, short- to medium-term outcomes, and longer term impacts including global environmental benefits, replication effects, and other local effects; and (**You may wish to strike out the inappropriate type of results**)

Sustainability – The likely ability of the project to continue to deliver benefits for an extended period of time after completion – i.e. project should be environmentally, financially and socially sustainable.

Stakeholder participation – How well do you believe that the relevant project stakeholders were involved in the project design, formulation, implementation, and monitoring?

Monitoring and evaluation – How would you rate the monitoring and evaluation of the project?

2. Looking back on the project (i.e. with hindsight), what would you have done differently, if any, regarding any one of the dimensions listed under Question 1.

3. Do you believe that the project has played a catalytic role in promoting private sector led development of on-grid power in Tunisia? Yes/No/Partially.

4. Are there any risks that have not been identified in the project concerning the sustainability of project outcomes? Yes / *No.* If 'yes' please specify.

5. (a) Have there been factors outside the project boundary that have assisted project outcomes. Yes/*No*. If 'yes' please specify.

   (b) Have there been factors outside the project boundary that have prevented project outcomes. Yes/*No*. If 'yes' please specify.

   (c) Have there been factors within the project boundary that have prevented project outcomes. Yes/*No.* If 'yes' please explain.

6. (a) What do you believe the strengths of the project have been?

   (b) What do you believe the weaknesses of the project have been? If there are any, please mention how they could have been overcome.

   (c) Are there any opportunities that the project failed to capitalise on? If yes, please explain how they could have been reaped.

7. How has the project benefited the private sector?

8. (a) How would you rate the level of private sector awareness of the barriers and risks of investing in wind power in Tunisia?

   (b) How would you describe the level of social acceptability of wind power in Tunisia?

   (c) What do you think are the main barriers or events preventing private sector investment in wind power in Tunisia?

9. Have there been any major changes that have affected the project since its conceptualization and formulation? (if yes, please provide details)

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PART C - Specific Questions

This part contains specific questions pertaining to the design, formulation, relevance, implementation and performance of the project. Please **briefly substantiate your responses**. Please write 'N/A' if you are unable to answer a question.

Conceptualization/Design

1. Do you believe that the issue the programme sought to address has been clearly identified and the approach soundly conceived?

2. Have the objectives and outputs of the programme been stated explicitly and precisely in verifiable terms with observable success indicators?

3. Have the relationship between objectives, outputs, activities and inputs of the programme been logically articulated?

Relevance:

1. How relevant has the project been to the development priorities of the country?

2. Which institutions have received the support of the project?

Implementation:

1. Has the project made use of an appropriate institutional arrangement to deliver its outcomes?

2. Have the interests of beneficiaries (private sector and other institutions) been duly addressed during implementation?

3. Has the project been responsive to any significant changes in its environment?

4. Have the lessons learned from other relevant projects/programmes been duly taken into account during the implementation of the project?

5. Were the monitoring and backstopping of the programme by the Government and UNDP been as expected?

6. Has the Government counterpart inputs in terms of personnel, premises and indigenous equipment been adequate?

Programme Performance:

1. Do you think that the project had adequate resources (financial, physical, manpower and political support) in terms of both quantity and quality?

2. Did the project use its resources effectively (i.e. produced planned results)?

3. Did the project use its resources efficiently to achieve planned results?

4. Have there been any environmental impacts (positive and negative) arising from the project? What remedial actions were taken for any 'negative' impacts?

5. What have been the major social impacts (positive and negative), including impact on the lives of women, of the project? What remedial actions were taken for any 'negative' impacts?

Questionnaire pour l'évaluation finale

Le Projet de développement d'énergie éolienne sur Réseau, mené par le secteur privé en Tunisie

par

Prakash (Sanju) Deenapanray, consultant international

Note explicative

En tant qu'acteur clé du projet cite ci-dessus, vous êtes probablement au courant que le projet fait l'objet d'un examen indépendant. Selon la procédure standard, il est nécessaire d'effectuer une Evaluation Finale en vertu de la politique de suivi et d'évaluation des politiques et des directives concernant les normes du PNUD / FEM[85]. Cet examen indépendant comprend quatre objectifs, à savoir:

1. Faire le suivi et évaluer les résultats et les impacts;
2. Fournir une base pour la prise de décision sur les modifications et les améliorations nécessaires;
3. Promouvoir la responsabilité pour l'utilisation des ressources (même si cet exercice ne constitue pas un audit financier);
4. Fournir une rétroaction sur le projet, et diffuser les leçons tirées.

Bien que nous vous invitions à vous identifier, veuillez noter que vous avez droit à l'anonymat. Dans le cas où vous souhaitez garder l'anonymat, veuillez indiquer toutefois à quel groupe d'intervenants ou à quelle l'institution vous appartenez.

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Partie A - Détails de la personne interrogée

Nom de la personne:

Affiliation (nom de l'institution):

Adresse:

Votre participation ou celle de votre institution au projet:

Les étapes de la participation dans le PROGRAMME: Conception; formulation; Mise en œuvre; Suivi et évaluation; Autre (merci de préciser)- **Veuillez *cocher* la case appropriée.**

========== ==========

PARTIE B - Questions générales (à être répondues par toutes les parties prenantes)

1. Veuillez fournir vos commentaires généraux sur les éléments suivants du projet en utilisant les notations suivantes: Très Satisfaisant, Satisfaisant, Peu Satisfaisant, Pas du tout Satisfaisant, ou N / A. Vous devez utiliser une notation par composante.

Justifiez brièvement votre réponse (où cela s'avère applicable).

Pertinence - La mesure dans laquelle le projet est adapté aux priorités de développement locales et nationales et les politiques organisationnelles, y compris les changements au fil du temps;

Efficacité - La mesure dans laquelle un objectif a été atteint ou comment il est susceptible d'être atteint;

Efficience - La mesure dans laquelle les résultats ont été accomplis avec les ressources les moins coûteuses possibles (tout en notant que cette évaluation ne constitue pas un audit financier);

Résultats - Les changements positifs et négatifs, ceux prévus et imprévus, et les effets produits par une intervention de développement. Ceux-ci comprennent des résultats directs du projet, à court et à moyen terme, les résultats et les impacts à long terme y compris les avantages environnementaux pour la planète, les effets de réplication et d'autres effets locaux; et

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[85] Guidelines for GEF Agencies in Conducting Final Evaluations, Evaluation Document No. 3 (Global Environment Facility, Evaluation Office, 2008); et The GEF Monitoring and Evaluation Policy, Evaluation Document No. 1 (Global Environment Facility, Evaluation Office, 2006) – les deux documents étant accessibles via http://thegef.org - 12 juillet 2010.

(Vous pouvez rayer le type de résultats inapproprié)

Développement durable - La probabilité du projet de continuer à offrir des avantages pour une période de temps étendue après que le projet soit terminé – c.à.d. le projet doit être respectueux de l'environnement, et être financièrement et socialement durable.

Participation des parties prenantes - Pensez-vous que les acteurs pertinents du projet ont été bien impliqués dans la conception, la formulation, la mise en œuvre et le suivi du projet?

Suivi et évaluation - Comment évalueriez-vous le suivi et l'évaluation du projet?

2. En regardant en arrière sur le projet (c.à.d. avec du recul), qu'auriez-vous fait différemment, si cela est applicable, concernant les dimensions indiquées à la question 1.

3. Croyez-vous que le projet a joué un rôle de catalyseur dans la promotion du développement d'énergie sur réseau par le secteur privé en Tunisie? Oui / Non / Partiellement.

4. Y a t-il des risques qui n'ont pas été identifiés dans le projet concernant la durabilité des résultats du projet? Oui / Non. Si «oui» veuillez préciser.

5. (a) Y a t-il eu des facteurs externes au projet qui ont contribué aux résultats du projet ? Oui / Non. Si «oui» veuillez préciser.

(b) Y a-t-il eu des facteurs externes au projet, qui ont gêné les résultats du projet ? Oui / Non. Si «oui» veuillez préciser.

(c) Y a-t-il eu des facteurs internes au projet, qui ont gêné les résultats du projet ? Oui / Non. Si «oui» veuillez expliquer.

6. (a) Quels ont été, selon vous, les points forts du projet ?

(b) Quels ont été, selon vous, les faiblesses du projet? S'il y en a eu, veuillez mentionner comment elles ont pu être surmontées.

(c) Y a t-il eu des opportunités que le projet n'a pas réussi à saisir? Si oui, veuillez expliquer comment elles auraient pu être saisies.

7. Comment le projet a t-il bénéficié le secteur privé?

8. (a) Comment évalueriez-vous le niveau de sensibilisation du secteur privé par rapport aux obstacles et aux risques d'investissement dans l'énergie éolienne en Tunisie?

(b) Comment décririez-vous le niveau d'acceptabilité sociale de l'énergie éolienne en Tunisie?

(c) Quels sont d'après vous, les principaux obstacles ou événements qui obstruent l'investissement du secteur privé dans l'énergie éolienne en Tunisie?

9. Y a t-il eu des changements majeurs qui ont affecté le projet depuis sa conception et sa formulation? (si oui, veuillez fournir les détails)
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PARTIE C - Questions spécifiques

Cette partie contient des questions spécifiques relatives à la conception, la formulation, la pertinence, la mise en œuvre et la performance du projet. Veuillez justifier brièvement vos réponses. Veuillez répondre «N / A» si vous êtes incapable de répondre à une question.

Conception / Design

1. Pensez-vous que le problème que le programme cherchait à résoudre a été clairement identifié et l'approche solidement conçue?

2. Est-ce que les objectifs et les résultats du programme ont été indiqués explicitement et avec précision en termes vérifiables avec des indicateurs de réussite observables?

3. Est-ce que la relation entre les objectifs, les résultats, les activités et les entrées du programme a été articulée de manière logique?

Pertinence:

1. Dans quelle mesure le projet a-t-il cadré avec les priorités de développement du pays?

2. Quelles sont les institutions qui ont reçu le soutien du projet?

Mise en œuvre:

1. Est-ce le projet a eu recours à un arrangement institutionnel approprié pour obtenir ses résultats?

2. Est-ce que les intérêts des bénéficiaires (secteur privé et autres institutions) ont dûment été abordés lors de la mise en œuvre?

3. Le projet a-t-il été sensible aux changements significatifs qui ont eu lieu dans son environnement?

4. Est-ce que les enseignements tirés d'autres projets / programmes pertinents ont été dûment pris en compte lors de la mise en œuvre du projet?

5. Est-ce que le suivi et le filet de sécurité assuré par le gouvernement et le PNUD ont été comme fait prévu?

6. Est-ce que les contributions de contrepartie du gouvernement en termes de personnel, de locaux et de matériel indigène ont été suffisantes?

La performance du programme:

1. Pensez-vous que le projet disposait de ressources suffisantes (financières, matérielles, humaines et un soutien politique) en termes de quantité et de qualité?

2. Est-ce que le projet a utilisé efficacement ses ressources (c.à.d. produit des résultats prévus)?

3. Est-ce que le projet a utilisé ses ressources de manière efficace pour atteindre les résultats prévus?

4. Y a-t-il eu des impacts environnementaux (positifs et négatifs) découlant du projet? Quelles sont les actions correctives qui ont été prises pour les impacts «négatifs»?

5. Quels ont été les principaux impacts sociaux (positifs et négatifs), y compris l'impact du projet sur la vie des femmes? Quelles ont été les actions correctives prises pour les impacts «négatifs»?

Annex 3 – Responses of Stakeholders to Questionnaire Survey

The general responses provided by participants to the questions in the survey are summarized below. Please note that all the duly completed questionnaires were submitted together with this FE Report for validation.

PART A	
Relevance	All respondents were adamant that the programme was highly relevant to Tunisia given the significant impact that renewables can have on energy security; lowering the energy bill; lowering the burden of energy subsidies on budget deficit; job creation; and reduction of GHG emissions.
Effectiveness	This was marked 'satisfactory' by respondents since the main outputs of the programme are yet to be had, but there is good indication that these outcomes are forthcoming and that the programme will have long-term impacts in transforming the market for EE appliances in Jordan.
Efficiency	Marginally satisfactory based on CDRs.
Results	The main results of the programme have been achieved, especially regarding the proclamation of the RE Law 2014. Other outputs of the project such as FiT, work on energy sector NAMA, private concession models and deign of an independent energy regulator, among others, will be essential for the implementation of the TSP
Sustainability	The sustainability of the project beyond its lifetime will be ensured by the ANME-UNDP-GEF project entitled "NAMA Support to the Tunisian Solar Plan" that started at the end of 2014 and will have a lifetime of 5 years. The project "NAMA Support to the TSP" was designed taking into consideration several results that were generated by the TWED project.
Stakeholder participation	This has been identified as a weakness of the project.
Monitoring & Evaluation	Monitoring and evaluation would be marginally satisfactory as the main results are yet to be achieved; need to capture the views of most of the programme target groups and the beneficiaries and benefactors.
Catalytic Role	Given that the project implementation has overlapped with the difficult post-revolution political transition in Tunisia, and given the resistance of STEG to provide political support for the liberalization of the power supply market, the catalytic role of TWED is partial. Nevertheless, it has built the foundation for private investment in renewable energies to take place, especially through other initiatives like "NAMA Support to the TSP" that is being implemented by the ANME.
Strengths of programme	Stakeholder coordination especially regarding the consultations that took place during the design, review and approbation of the RE Law 2014.

Weaknesses of programme	Delays accruing due to lack of coordination and communication between key stakeholders. Delays were also noted due to lengthy procurement processes of both UNDP and ANME. The PSC did not play its role of providing political guidance and support to the project, and was not able to address the issue of resistance by STEG decisively.
Public Awareness of RE in Tunisia	This has been rated as being adequate.
PART B	
Conceptualization of TWED	The interviewees reported that the conceptualization of TWED was appropriate, especially after the first version that sought to provide partial financial incentives to cover the FiT for wind power was removed from the project design.
Relevance	All respondents were adamant that the programme was highly relevant to Tunisia given the issues of energy security and impact of energy subsidies on the State budget.
Implementation effectiveness and efficiency	Almost all respondents mentioned that the programme was implemented using the appropriate institutional set up, and that backstopping from UNDP was appropriate.
Performance	The main shortcoming of the project was that the immediate goal of generating direct emission reductions through the commissioning of 60MW of wind power by the private sector was not achieved. Since the outputs were satisfactory, the overall performance has been noted moderately unsatisfactory.

Annex 4 – Stakeholders Consulted for the FE

Date	Time	Organization
Monday 8th December 2015	09h00	PMU
	10h30	M. Ibrahim Abdeljalil STEG Projets EREE Venue : STEG Contact : aibrahim@steg.com.tn Tél :98268489
	14h00	M.Abdelhamid khalfallah DGE Venue : General Directorate of Energy Contact :KHALFALLAH.Abdelhamid@mit.gov.tn
	15h30	M.Lotfi Hamza/ IPP Group Venue : HQ IPP Group Tunis 86 Avenue Mohamed V 1002 Tunis-Belvédère - Tunisie Contact : lotfi.hamza@mit.gov.tn Tél : 98996256
Tuesday 9th December 2015	09h00	M. Hassen Agrebi International Cooperation ANME Venue : ANME
	10h30	M.Hamdi Harrouch General Director ANME
	14h00	Mme Lilia Kobbi DAJP ANME
Wednesday 10th December 2015	09h00	M. NAFAA Baccari Tunisian Wind Energy Association, TWEA Venue : ANME
	10h30	M Abdelkarim Ghezal DER / ANME Venue : ANME
	14h00	M.Chokri ben SLIMAN STEG Renewable Energies Venue : STEG(RADES) Contact : chokribenslimane@yahoo.fr
	15h30	Jihene Touil, UNDP Contact : jihene.touil@undp.org *Note : Since Ms Jihene Touil had to carry out a mission overseas, a teleconference call was organized on Thursday 29 January 2015.*
Thursday 11th December 2015	09h00	M. Nafaa Baccari PMU

Date	Time	Organization
		Note : The initial meeting planned with Dr Rafik Missaoui (Alcor and Chairperson of the Tunisian Association for Energy Conservation, ATME) was cancelled because Dr Missaoui was attending COP20 in Lima.
	10h30	Ciment de Gabes M. Ghodhbani Venue : ANME Contact : mghodhbani@scg.com.tn
	14h00	M. Omar Bay B.E Enerciel venue : Siège Enerciel Tunisie 3 Rue sophonisbe 2016 Carthage Contact : o.bhb@planet.tn
Friday 12th December 2015	10h30	Mme Sabria Brouni GEF Focal Point Venue : Ministry of Environment and Sustainable Development Contact : Sabria Bnouni sd.cib@mineat.gov.tn

Annex 5 – Strategic Results Framework of the Project

	Objectively Verifiable Indicators				
Goal	**To reduce Tunisia's energy related CO2 emissions by stimulating the development of wind energy through greater participation of private wind developers.**				
Strategy	**Indicators**	**Baseline**	**Target**	**Sources of Verification**	**Risk and Assumption**
Project Objective: To create a favorable regulatory and institutional framework that will provide the necessary incentives for private wind developers to invest in Tunisia's power sector, while assisting the government in crafting the most appropriate strategy for issuing tenders.	• Reduction in CO_2 emissions • Issuance of private wind concessions • Private sector wind power investments	• No CO_2 reductions from private sector wind projects • No private sector investment	• CO_2 emissions reduced by 2.2 million tons from direct impacts • Private sector has invested US$ 60 million during life of project (Totaling 60 MW on wind capacity)	• IPP Group concession agreements • Survey of private wind developers • Review of government regulatory legislation	• Oil prices stay above US$ 40-60 threshold • IPP Group is successful in issuing international tenders • Market for private wind concessions in developing countries remains strong

Outcome 1: Enabling regulatory and institutional framework has been established in support of on-grid renewables	• Strengthened commitment of government to push through a program of private sector on-grid wind power	• Limited government policies promoting private on-grid wind projects	• Government documents on wind energy	• MIEPME internal documents	• Govt. adopts a regulatory framework that ensures reasonable rate of return to developers
Output 1.1: Regulatory framework has been established for on-grid wind concessions	• Adoption of an enabling regulatory framework	• No regulatory framework defining market access conditions for developers	• Enabling regulatory framework provides the necessary safeguards and incentives for private wind developers	• Government regulatory filings	• Govt. adopts a regulatory framework that ensures reasonable rate of return to developers
Output 1.2: Proposal for power sector arbitration mechanism is developed	• Effective arbitration mechanism developed	• No arbitration mechanism to settle differences between STEG and new entrants	• Arbitration mechanism defined and implemented by MIEPME	• MIEPME arbitration procedures manual	• Govt accepts value c regulatory mechanism to resolve disputes between operators
Outcome 2: Technical and organizational capabilities of key stakeholders have been strengthened	• Strengthened capacity of key stakeholders to engage in wind power market	• Limited experience with large scale wind projects	• Technical assistance provided according to workplan	• Internal agency document	• Quality of technical assistance, along with receptivity of recipient
Output 2.1: Technical assistance and capacity building provided to the ANME	• Technical inputs for regulatory frameworks	• Limited technical inputs for regulatory frameworks	• Technical wind absorption capacity study of the grid • Specifications to interconnect private wind farm to grid	• Project files • ANME internal documents	• Ability of ANME to establish technical credibility

Output 2.2: STEG ability to integrate independent wind electricity production in its grid is strengthened	• Capacity of STEG to manage injection of wind power into the electricity grid	• Uncertainty about intermittency risks pushes STEG to reject private wind power	• Documented STEG plan to manage wind injection in network	• Project files • STEG internal documents	• STEG prepared to accept reasonable risk of wind intermittency
Output 2.3: Local industry ability to supply equipment and services to wind operators has been improved	• Increased participation of Tunisian companies	• Limited integration of local industry	• 30% of value of equipment and services provided by local firms	• Survey of wind developers and local suppliers/service providers	• Tunisian companies not competitive enough with foreign businesses
Outcome 3: IPP Group able to launch private wind concession program	• Increased participation by private developers	• No private developers doing projects	• 60 MW of Wind Power installed by IPP	• IPP Group and ANME files • Investment of $US 60 M from private sector	• Developers perceive that rate of return is sufficient
Output 3.1: Concession models for private wind power evaluated, and contractual documents prepared for one or more models	• Strengthened capacity of IPP Group to issue wind tenders and finalize private concessions	• No concession model for private wind concessions is identified	• One or more concession models have been identified and contractual documented prepared	• Concession models from IPP Group	• Concessioning mode adapted to developing countries is identified
Output 3.2: Tariff mechanism developed and tariff proposed	• Proposed tariff is calculated	• Differing interpretations of appropriate tariffs levels between MIEPME and STEG	• Tariff mechanism is clearly identified and STEG avoided cost is calculated	• Feed-in tariff methodology and calculation	• IPP Group ability to calculate STEG's avoided cost
Outcome 4: Monitoring and evaluation support provided	• Timely reporting and monitoring of the project	• None	• Project workshops held on timely basis • Timely submission of all M&E reports	• Reports and workshop minutes from M&E team	• Cooperation of project stakeholders

Output 4.1: Project monitoring and evaluation have been conducted	• Timely reporting and monitoring of the project	• None	• Reporting and evaluation are conducted accurately and on time	• Consultant reports	• Lack of coordination among project partners
Output 4.2: Technical program assistance has been provided to MIEPME and ANME	• Level of technical program assistance	• None	• The level of technical program assistance is acceptable	• Interviews with UNDP and government agencies	• None

Annex 6 - List of Additional Activities and Indicators Proposed in MTE Report

Following the Mid-Term Evaluation of the project, it was recommended to plan further actions as discussed below. However, it is to be noted that some activities are already covered in the Project Results Framework shown in **Annex 5**. The overlapping activities are italicized.

Outcome1: Enabling regulatory and institutional framework has been established in support of on-grid renewables:

- Realization of a documentary on wind energy in Tunisia.
- Realization of communication products.
- *Drafting of laws and a decree governing the production of renewable energy in Tunisia.*
- *Realization of a study on the establishment and structuring of an independent regulatory body.*
- *Review and proposal for an institutional framework.*
- *Study on the integration of local industry in the development of wind farms.*

Outcome 2: Technical and organizational capabilities of key stakeholders have been strengthened:

- Study and training for NAMA development potential in the renewable electricity sector in Tunisia.
- *Study and training for central planning strategies for wind power projects.*
- *Study and training on the impact of intermittent energy on the grid and precautions.*

Outcome 3: IPP Group equipped to launch private wind concession programme:

- *Elaboration of tender documents and model contracts for the IPP Group.*
- *Elaboration of a feasibility study for three wind sites in Tunisia.*

Outcome 4: Monitoring and evaluation support provided:

- Recruitment of a technical-economic consultant to coach the team in the elaboration of ToRs on specified technical subjects

Annex 7 – Baseline supporting activities and parallel financing

The TWED project has benefitted from the parallel implementation of several energy-related projects by the ANME. In particular, there have been significant initiatives on the development of NAMAs. The baseline supporting activities and levels of financing (where available and applicable) are described below. Some of these activities focus on creating the conditions for market readiness, and that will foster a higher level of private sector participation in the development of renewable energies and energy efficiency.

An ANME-GIZ project, **Building Capacity for GHG Inventory and MRV in Tunisia** (2012-2015, €2,000,000), has just been initiated: one component of this project is to set up an MRV system for the energy sector, although the final choice may focus on building energy efficiency. In any case, the GEF project will coordinate with the ANME-GIZ project on overlapping MRV issues as they relate to NAMAs. There is an ongoing project, **Energy Conservation in Buildings in Tunisia** (2012-2013, €300,000), that is part of the global 'Mitigation Momentum' project funded by the Government of Germany in five countries and which in Tunisia is implemented by ANME/Ecofys. The GEF project will work in close collaboration with this project on several issues, including sustainable development criteria and indicators for NAMAs, identification and prioritization of NAMAs, and development of NAMA action plans. A project entitled **Establishing a Mechanism for Reducing GHG Emissions in the Cement Sector in Tunisia** (2012-2013; €148,125) is being implemented by ANME-GIZ. This project seeks to establish a cap-and-trade system for the cement industry. While the project may be over-ambitious in its goals, it does seem likely to design a dedicated MRV system for the cement sector: lessons-learned and overlapping aims will be coordinated with the GEF project.

Energy sector NAMA-related initiatives

Since expressing its voluntary mitigation targets in the context of the Copenhagen Accord, the Government of Tunisia has been very active in exploring NAMA opportunities, attracting support and investment from Annex 1 countries and international organisations. Exploratory and preliminary design work for future NAMAs has been undertaken in various sectors, including the cement industry, buildings, and energy sectors.[86] These initiatives have been funded by the German Federal Ministry for the Environment, Nature Conservation, Building & Nuclear Safety (BMU), the German Federal Ministry for Economic Cooperation and Development (implemented by the German agency GIZ) and UNDP.

Cement industry

BMU has, through GIZ, supported ANME to implement a project entitled "Development of the concept of a mechanism for mitigation in the cement industry".[87] The mechanism has been designed to promote the implementation of mitigation actions in four categories: (1) energy efficiency (1.7 $MtCO_{2e}$ of emissions savings by 2020); (2) alternative fuels (2.6 $MtCO_{2e}$ by 2020); (3) better segmentation of the cement market according to demand in order to reduce the clinker/cement ratio (1.2 $MtCO_{2e}$ by 2020); and (4) renewable energy (construction of wind farms) (2.5 $MtCO_{2e}$ by 2020). The total investments in these mitigation actions have been estimated at €970 million (~ US$ 1,330 million) for a potential GHG emission reduction of 8

[86] NAMAs in the agriculture, waste water and on a local scale (Sfax) in transport are also under development.

[87] ANME (2013), *Développement d'un Concept de Mécanisme d'Atténuation dans le Secteur Cimentier en Tunisie*, GIZ: Tunis.

$MtCO_{2e}$ between 2014 and 2020. The emission reductions are expected to result in a 21% reduction of the carbon intensity of cement production by 2020 (i.e. a reduction to 0.626 tCO_{2e}/t(cement)) compared to the business-as-usual scenario of 0.793 tCO_{2e}/t(cement).

Building sector NAMA – Mitigation Momentum project

Tunisia is one of five countries that participated in the Mitigation Momentum project in 2013.[88] The Mitigation Momentum project is supported by BMU and aims to promote the development of NAMAs by contributing to the development of NAMA proposals and by fostering cooperation and knowledge exchange within the NAMA community. ANME has developed a NAMA in the building sector in Tunisia.[89] This NAMA includes three technological components: a solar component (including solar water heaters and solar panels), an insulation component, and a research component focusing on innovative technologies for air conditioning. Policy, technical, communication and research activities aim to address various barriers, including information, technical capacity and financial barriers. The NAMA financial mechanism includes international grants for programme costs and research activities as well as national subsidies, concessional loans and credit lines for technology costs. The NAMA remains a concept at the current time.

Energy sector NAMA

With the technical assistance of UNDP, ANME has developed a NAMA Strategy for the Energy Sector, consisting of ten components for NAMA preparedness.[90] These components are: (1) institutional structures, (2) identification of priority NAMAs, (3) identification of sustainable development criteria, (4) development of priority NAMAs, (5) establishment of MRV systems for priority NAMAs, (6) development of a NAMA portfolio, (7) awareness-raising and sensitisation, (8) capacity building, (9) sub-regional NAMAs, and (10) monitoring and evaluation of the strategy. The UNDP-implemented, GEF-financed project will essentially flesh out and operationalize this NAMA Strategy for the Tunisian Solar Plan.

In 2014, a UNDP-funded study investigated the options for NAMAs in the renewable electricity sector.[91] The mitigation potential offered by the TSP relates to the reduction in the emission factor of the electricity sector to 372 tCO_{2e}/GWh by 2030 compared to the business-as-usual emission factor of 528 tCO_{2e}/GWh (2012). This study has established that the limited success of the TSP to date (because of the lack of investments) is due to a combination of natural gas subsidies, a near-monopoly on electricity production (STEG), regulatory road blocks, and weak incentives for development of renewable energy. The study concludes that a combination of financial and non-financial policies to overcome these barriers may be combined into a NAMA to obtain international financial support – i.e. a supported NAMA – for the TSP.

The financial policies identified by the study that could be embodied in such a NAMA consist of a basket of options, including: subsidy reforms (for electricity generated from gas); subsidies for renewable energy (e.g. fiscal incentives – reduction of VAT; feed-in-tariffs; concessional credit lines); investment funds (e.g. revolving funds and community-based investments; FNME/ETF); competitive bidding processes; tradable quotas; and public investments. Non-financial measures could include: institutional reform in the power sector; development of a grid code for RES; dissemination of information about procedures for permits, PPAs and tariffs; management of the

[88] http://www.mitigationmomentum.org/partner_countries.html - accessed 4 June 2014.
[89] http://www.mitigationmomentum.org/downloads/MM_Flyer_Tunisia_201311.pdf - accessed 4 June 2014.
[90] ANME (2012), *Strategie NAMA dans le Secteur de l'Energie en Tunisie*.
[91] ANME (2014), *Analyse des Possibilités NAMA dans le Secteur d'Electricité Renouvelable*.

national grid (technical feasibility to integrate intermittent RES in the grid, and grid stability); technical capacity building; and analysis of risks to investments in RES.
The study provides the broad architecture for developing an energy-sector NAMA that covers:

- The way forward – A six-step process is proposed that includes: (1) barrier analysis and identification of measures to overcome barriers; (2) definition of policy instruments to include in the NAMA; (3) presentation of the NAMA internationally (to obtain international support); (4) implementation of regulatory and institutional reforms; (5) implementation of financial mechanisms; and (6) development of pilot activities on NMMs (e.g. credited NAMAs that will be a focus of the PMR initiative (see Section 1.3.2.2));
- MRV system – Several options are proposed for consideration, including CDM methodologies (*ex ante* or *ex post*); Verified Carbon Standard (VCS) methodologies (similar to the CDM); and the GHG Protocol;
- Avoiding double-counting – Care has to be exercised to avoid the double-counting of GHG emission reductions from two sources, namely: (i) CDM projects in the power sector (e.g. wind farm projects); and (ii) sectoral NAMAs that include components related to the displacement of grid electricity in their baselines (e.g. energy efficient appliances in a building sector NAMA versus an energy sector NAMA).

The study also makes several recommendations to accelerate the implementation of the TSP through a combination of measures that aim to overcome existing barriers in a systemic manner. These measures can be summarised as follows:

High-level policy decisions

- Removal of subsidies on fossil fuels and electricity, while safeguarding vulnerable groups in society;
- Enhancement of the transparency of bidding procedures for IPPs (national and international);
- Establishment of a FiT to pay the incremental cost of renewable electricity compared with gas-generated electricity;
- Institutional reform of STEG.

MRV

- ANME should be the coordinating institution for the MRV system in the energy sector;
- The MRV system should be based on existing approved CDM methodologies.

Financing

- Use diversified sources of financing, while bearing in mind that only innovative NAMAs have a good chance of attracting international support;
- Development of a well-defined basket of financial instruments that support policy measures (e.g. those listed above under 'high-level policy decisions').

Research

- Carry out an independent study of the real cost of generating renewable electricity from PV, wind and CSP, while taking into account the costs of grid integration, grid extension and other administrative costs;
- An independent study on the stability of the grid to establish the technically-feasible penetration of RES, as well as the institutional capacity of STEG to manage such a grid;
- Development of tertiary-level courses in collaboration with a European university on management of a grid with renewables.

Communication

- Communicate the NAMA, including instruments that would need financing, at CoP 20 in Lima;
- Develop a portal for the management of data and information related to all aspects of grid-connected renewables that will serve to connect all stakeholders, and will be an integral part of the MRV system.

NAMA-enabling initiatives

Partnership for Market Readiness (PMR)
Tunisia has recently joined the World Bank's Partnership for Market Readiness (PMR) initiative. In February 2014, ANME presented its organising framework for consideration and discussion at the Partnership Assembly and is currently starting the process of formulation of its Market Readiness Proposal (MRP) for final approval.[92] Tunisia's participation in the PMR comes in the context of confirming its engagement with NMMs through a position paper to the UNFCCC in March 2013 in accordance with FCCC/CP/2012/L.14/Rev.1, paragraph 52. In the PMR initiative, Tunisia has proposed to develop market or crediting mechanisms for both the cement industry and energy sector.

[92] ANME (2014), *Organising Framework for Scoping of PMR Activities* – presentation made on 14 February 2014, Mexico.

Annex 8 - Calculation of GHG emission reductions

The indirect direct emission reduction calculations have been calculated as the product of the expected energy generation from RE plants and the grid emission factor of Tunisia.

$ER_y = El_y \times EF_{grid}$ (1)

Where, ER_y is the emission reduction in year y,

El_y is the electricity generated by the RE plant in year y, and

EF_{grid} is the grid emission factor of the Tunisia electricity system.

Calculating the grid emission factor, EF_{grid}

The Combined Margin (CM) grid emission factor was calculated using the CDM Methodological Tool 07 – i.e. "Tool to calculate the emission factor for an electricity system (Version 04.0)".[93]. The calculation of the CM is carried out in four steps as follows:

Step 1: The CM has been calculated as the weighted average of the Operating Margin (OM) emission factor and the Build Margin (BM) emission factor;

$$EF_{grid} = EF_{CM} = w_{OM} \times EF_{OM} + w_{BM} \times EF_{BM} \quad (2)$$

Where, w_{OM} and w_{BM} are weights (see **Step 4**),

EF_{OM} is the operating margin emission factor, and

EF_{BM} is the build margin emission factor.

Step 2: Since renewable electricity is less than 50% of total electricity generation in the electricity system (which has no off-grid power plants), OM has been computed using the Simple OM method. Table A.7.1 shows the electricity generation and fuel consumption for power plants in Tunisia. The share of renewable electricity has been less than 8% between 2007 and 2011 (the latest year for which generation data is available).

[93] http://cdm.unfccc.int/methodologies/PAmethodologies/tools/am-tool-07-v4.0.pdf - accessed 12 December 2013.

Table A.7.1. Electricity generated and fuel consumption for power plants, 2007-2011.

					2007		2008		2009		2010		2011		
Fuel Type	Plant	Technology	Installed Capacity (MW)	Date Commissioned	GWh	toe	GWh	toe	GWh	toe	GWh	toe	GWh	toe	tCO2
Natural Gas	Sousse	CC	364		2,211	438,646	1,642	334,139	2,229	442,839	2,786	547,590	2,782	554,996	1,261,746.04
	Ghannouch	CC	416	2011									1,554	264,707	601,793.46
	Radès CPC	CC	471	2001	3,054	607,379	3,338	659,857	3,155	625,522	3,224	635,763	3,318	649,452	1,476,485.01
	Ghannouch	ST	60		332	113,165	365	124,002	302	103,361	257	88,679	-	-	-
	Sousse	ST	320		1,708	455,345	1,920	505,722	1,643	436,834	1,417	375,070	1,749	478,333	1,087,457.37
	Radès A	ST	340		1,262	323,584	1,677	431,957	1,718	452,986	2,023	529,418	1,948	512,205	1,164,463.24
	Radès B	ST	370	1998	1,233	318,562	1,767	438,898	1,854	468,494	2,101	527,418	1,847	468,739	1,065,646.24
	Goulette II	ST			0	-	-	-	-	-	-	-		-	-
	Tunis-Sud	GT	66		1	335	2	811	4	1,842	2	800	3	1,046	2,378.34
	Korba	GT	56		8	3,353	48	18,483	29	11,103	20	7,880	50	20,182	45,883.32
	Kasserine	GT	68		4	1,494	8	3,354	10	4,241	4	1,788	14	5,478	12,454.18
	Ghannouch	GT	44		7	2,855	6	2,215	3	1,252	3	1,199	1	453	1,029.92
	Bouchemma	GT	60		10	4,170	7	2,917	17	7,178	5	2,242	5	2,028	4,610.49
	Sfax	GT	44		3	1,029	3	1,258	4	1,676	2	818	2	976	2,219.27
	Bir M'cherga	GT	242		368	114,718	376	116,522	488	150,121	525	162,818	292	91,599	208,244.29
	Bouchemma	GT3	121		217	68,239	380	116,120	450	138,070	422	128,962	326	98,242	223,346.25
	Thyna	GT	119	########	634	186,643	778	229,724	724	211,990	940	280,211	646	197,909	449,932.90
	Thyna2	GT	120	June 2007				-		-		-			-
	Thyna3	GT	126	########				-		-		-			-
	Goulette	GT	119	########	77	23,485	80	24,587	138	41,474	134	41,129	63	18,820	42,786.00
	Feriana	GT	110	########	479	142,708	433	128,937	522	155,954	735	219,513	449	136,749	310,889.63
	Feriana2	GT	126	########				-		-		-			-
	SEEB	GT	27	2003	-	-	102	39,863	114	37,371	2	791	-	-	-
Fuel Oil	Ghannouch	ST	60		-	-	-	-	-	-	-	-	-	-	-
	Sousse	ST	320		27	7,288	-	-	-	-	-	-	-	-	-
	Radès A	ST	340		897	216,889	346	83,297	343	83,333	2	513	-	-	-
	Radès B	ST	370		467	114,459	336	80,552	158	38,196	-	-	-	-	-
	Goulette II	ST			-	-	-	-	-	-	-	-	-	-	-
DIESEL	Sfax	GT	44		-	-	-	-	-	-	-	-	0.00		-
	M. Bourguiba	GT	44		-	52	-	77	-	77	1	195	0.50	213	647.74
	Metlaoui	GT			-		-	-	-	-	-	-	0.00		-
	Korba	GT	56		-	6	-	1	-	3	-	-	0.00		-
	Kasserine	GT	68		-		-	1	-	-	-	-	0.00		-
	Robbana	GT	34		-	19	-	68	-	62	-	134	0.40	159	482.93
	Zarzis	GT	34	1999	-	21	-	50	-	27	-	329	0.30	151	458.97
	Bir M'cherga	GT	242		-	31	-	33	-	24	-	33	0.10	30	90.91
	Radès A et B	ST			-		-	-	-	-	-			2,176	-
	Bouchemma	GT			-	9	-	22	-	18	-	31		17	51.55
	Feriana	GT	110	########	-	14	-	15	-	125	-	112	0.00	56	170.00
	Goulette	GT	119	2005	-	23	-	19	-	20	-	23	0.04	15	45.65
	Thyna	GT	119	########	-	403	-	79	-	55	-	329	0.00	76	231.00
	Ghannouch	CC			-	-	-	-	-	-	-	-			-
LOW COST / MUST RUN PLANTS (no fuel consumption data is required)															
HYDRO	Sidi salem	NOT APPLICABLE	36			NOT APPLICABLE		NOT APPLICABLE		NOT APPLICABLE		NOT APPLICABLE		NOT APPLICABLE	
	Fernana		9.7												
	Nebeur		13												
	Aroussia		4.8												
	Kasseb		0.7												
	Bouhertma		1.3	2003							1				
	Sejnene		0.6	2005							0.5				
Sub-total					*48.6*		*38*		*78.9*		*50.1*		*53.7*		
WIND	Sidi-Daoud I	NOT APPL	19.3	2000		NOT APPL		NOT APPL		NOT APPL		NOT APPL		NOT APPL	
	Sidi-Daoud II		35.7	########							91				
	Bizerte I		120.12	2012											
	Bizerte II		68.64	-											
Sub-total					42.9		39.4		97.5		138.6		109.2		
TOTAL WIND AND HYDRO					91.5		77.4		176.4		188.7		162.9		
Self-producers (GWh)					877.6		894.5		871.9		1023.9		693.9		
Total centralised and decentralised REs					969.1		971.9		1048.3		1212.6		856.8		
TOTAL NATIONAL (GWh)					13,967.42		14,584.33		14,953.80		15,817.90		15,905.24		
TOTAL Fossil (GWh)					12,998.32		13,612.43		13,905.50		14,605.30		15,048.44		
Total consumption (toe)						3,144,024		3,143,580		3,414,248		3,353,788		3,504,807	
Assuming that self-producers are from PV or wind															
% renewable of total generation					6.9		7.1		7.0		7.7		5.4		

The Simple OM emission factor has been calculated (Table A.7.2) using the ex-ante option using 3-year generation-weighted average (i.e. 2009, 2010 and 2011), based on the most recent data available. Low-cost/must-run power plants/units are excluded.

Table A.7.2. Operating margin emission factor.

Year	2009	2010	2011
total CO2 (tCO2)	7,870,246	8,080,650	7,963,544.70
tCO2/GWh	565.980799	553.2683341	529.194036
EF(OM)	549.4810564 tCO2/GWh		
	0.54948 tCO2/MWh		

Note: *Emissions data for 2009 and 2010 taken from the Bizerte PDD.*[94]

[94] The combined margin grid emission factor for Tunisia was last calculated for the approved CDM project entitled "Bizerte Wind Farm Project – version 04 – 12/07/2012" - http://cdm.unfccc.int/filestorage/_/9/UF48RG6BIWHZLVPMD7KAYCNSO9Q5J1.pdf/6268-%20PDD-%202012%2007%2031.pdf?t=U0N8bjhxcnF4fDCln8LFri19YYTrvKOtRks8 – accessed 14 July 2014. The grid emission factor was calculated using statistical data for 2008, 2009 and 2010. The calculation of grid emission factor presented here

Step 3: The BM emission factor has been calculated using the ex-ante option using generation statistics for 2011 (latest statistical data available). The procedure used to determine the group of power units to determine the BM is shown in Figure A.7.1.

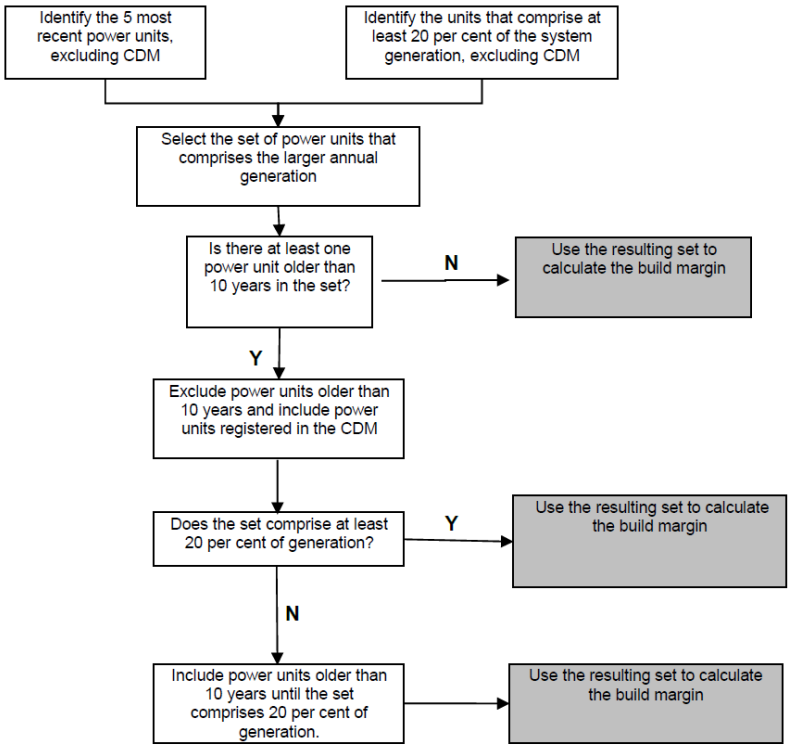


Figure A.7.1. Procedure to determine the sample group of power units used to calculate the build margin.

The procedure shown in Figure A.7.1 has been applied to the power park shown in Table A.7.3 to arrive at the sample group of power units shown in Table A.7.4.

uses both the most recently available statistical data and the current CDM methodological tool to calculate the grid emission factor of an electricity system.

Table A.7.3. Power park for calculating BM.

					2011		
Fuel Type	Plant	Technology	Installed Capacity (MW)	Date Commissioned	GWh	toe	
Natural Gas	Sousse	CC	364		2,782	554,996	
	Ghannouch	CC	416	2011	1,554	264,707	
	Radès CPC	CC	471	2001	3,318	649,452	
	Ghannouch	ST	60		-	-	
	Sousse	ST	320		1,749	478,333	
	Radès A	ST	340		1,948	512,205	
	Radès B	ST	370	1998	1,847	468,739	
	Goulette II	ST				-	
	Tunis-Sud	GT	66		3	1,046	
	Korba	GT	56		50	20,182	
	Kasserine	GT	68		14	5,478	
	Ghannouch	GT	44		1	453	
	Bouchemma	GT	60		5	2,028	
	Sfax	GT	44		2	976	
	Bir M'cherga	GT	242		292	91,599	
	Bouchemma	GT3	121		326	98,242	
	Thyna	GT	119	18/06/2004	646	197,909	210.52
	Thyna2	GT	120	June 2007			212.28
	Thyna3	GT	126	16/04/2010			222.90
	Goulette	GT	119	18/07/2005	63	18,820	
	Feriana	GT	110	19/06/2005	449	136,749	
	Feriana2	GT	126	16/04/2010			239.56
	SEEB	GT	27	2003	-	-	
Fuel Oil	Ghannouch	ST	60		-	-	
	Sousse	ST	320		-	-	
	Radès A	ST	340		-	-	
	Radès B	ST	370		-	-	
	Goulette II	ST			-	-	
DIESEL	Sfax	GT	44		0.00		
	M. Bourguiba	GT	44		0.50	213	
	Metlaoui	GT			0.00		
	Korba	GT	56		0.00		
	Kasserine	GT	68		0.00		
	Robbana	GT	34		0.40	159	
	Zarzis	GT	34	1999	0.30	151	
	Bir M'cherga	GT	242		0.10	30	
	Radès A et B	ST				2,176	
	Bouchemma	GT				17	
	Feriana	GT	110	19/06/2005	0.00	56	
	Goulette	GT	119	2005	0.04	15	
	Thyna	GT	119	18/06/2004	0.00	76	
	Ghannouch	CC					
LOW COST / MUST RUN PLANTS (no fuel consumption data is required)							
HYDRO	Sidi salem	NOT APPLICABLE	36			NOT APPLICABLE	
	Fernana		9.7				
	Nebeur		13				
	Aroussia		4.8				
	Kasseb		0.7				
	Bouhertma		1.3	2003			1.0561271
	Sejnene		0.6	2005			0.4874433
Sub-total					*53.7*		
WIND	Sidi-Daoud I	NOT APPL	19.3	2000		NOT APPL	
	Sidi-Daoud II		35.7	26/02/2009			91
	Bizerte I		120.12	2012			
	Bizerte II		68.64	-			
Sub-total					*109.2*		
TOTAL WIND AND HYDRO					162.9		
Self-producers (GWh)					693.9		
Total centralised and decentralised REs					856.8		
TOTAL NATIONAL (GWh)					15,905.24		
TOTAL Fossil (GWh)					15,048.44		
Total consumption (toe)						3,504,807	

Table A.7.4. Determining the group of power units to calculate BM (colour coding corresponds to units in Table A.7.3).

5 most recent power units			Ghannouch, Thyna2, Thyna3, Feriana2 and Goulette				
			Thyna2, Thyna3 and Feriana2 pro-rated generation				
highlighted in yellow		2,292	GWh				
		14.40936622	< 20%				
Units that comprise at least 20% excluding CDM projects							
all highlighted in yellow + in blue							
		6,031	GWh				
		37.92	%				
Rades CDC is older than 10 years, so remove and add registered Sidi-daoud II							
		2,804	GWh				
		17.63	<20%				
So need to add Rades CDC							
		6,121.784	**GWh**		2,881,932.65	tCO2	
		38.49	**%**				

The BM emission factor has been calculated for the group of power units determined in Table A.7.4 as EF_{BM} = 0.47077 tCO_2/MWh.

Step 4: The weights accorded to OM and BM in calculating CM depends on the intervention measure that is being targeted. This is because EE or RE interventions (i.e. EE or RE) do not affect the electricity system in similar ways. For instance, PV and wind are variable renewable energy sources and are non-dispatchable in nature. For PV and wind energy projects, weights of 0.75 and 0.25 are applied to OM and CM, respectively. Equal weights of 0.5 are applied to all other projects. Table A.7.5 summarises the combined margin grid emission factor for different combination of weights.

Table A.7.5. Combined margin grid emission factor.

EF(OM)	0.54948	tCO2/MWh		
EF(BM)	0.47077	tCO2/MWh		
wOM	0.75	0.5	0.25	
wBM	0.25	0.5	0.75	
EF(CM)	**0.52980**	**0.51012**	**0.49045**	**tCO2/MWh**

Annex 9 – The Project Board – Role and Responsibilities

Overall responsibilities:
The Project Board (or Project Steering Committee) is the group responsible for making by consensus management decisions for a project when guidance is required by the Project Manager, including recommendation for UNDP/NERC approval of project plans and revisions. In order to ensure UNDP's ultimate accountability, Project Board decisions should be made in accordance to standards that shall ensure best value to money, fairness, integrity transparency and effective international competition. Project reviews by this group are made at designated decision points during the running of a project, or as necessary when raised by the Project Manager. This group is consulted by the Project Manager for decisions when PM tolerances (normally in terms of time and budget) have been exceeded.

Based on the approved annual work plan (AWP), the Project Board may review and approve project quarterly plans when required and authorizes any major deviation from these agreed quarterly plans. It is the authority that signs off the completion of each quarterly plan as well as authorizes the start of the next quarterly plan. It ensures that required resources are committed and arbitrates on any conflicts within the project or negotiates a solution to any problems between the project and external bodies. In addition, it approves the appointment and responsibilities of the Project Manager and any delegation of its Project Assurance responsibilities.

Composition and organization:
1) ANME (Chair)
2) IPP Group
3) STEG
4) Ministry of Industry and Energy
5) UNDP Tunisia

Specific responsibilities:
Initiating a project
- Agree on Project Manager's responsibilities, as well as the responsibilities of the other members of the Project Management team;
- Delegate any Project Assurance function as appropriate;
- Review the Progress Report for the Initiation Stage;
- Review and appraise detailed Project Plan and AWP, including Atlas reports covering activity definition, quality criteria, issue log, updated risk log and the monitoring and communication plan.

Running a project
- Provide overall guidance and direction to the project, ensuring it remains within any specified constraints;
- Address project issues as raised by the Project Manager;
- Provide guidance and agree on possible countermeasures/management actions to address specific risks;
- Agree on Project Manager's tolerances in the Annual Work Plan and quarterly plans when required;

- Conduct regular meetings to review the Project Quarterly Progress Report and provide direction and recommendations to ensure that the agreed deliverables are produced satisfactorily according to plans.
- Review Combined Delivery Reports (CDR) prior to certification by the Implementing Partner;
- Appraise the Project Annual Review Report, make recommendations for the next AWP, and inform the Outcome Board about the results of the review.
- Review and approve end project report, make recommendations for follow-on actions;
- Provide ad-hoc direction and advice for exception situations when project manager's tolerances are exceeded;
- Assess and decide on project changes through revisions;

Closing a project

- Assure that all Project deliverables have been produced satisfactorily;
- Review and approve the Final Project Review Report, including Lessons-learned;
- Make recommendations for follow-on actions to be submitted to the Outcome Board;
- Commission project evaluation (only when required by partnership agreement)
- Notify operational completion of the project to the Outcome Board.

Procedures

- The PB shall conduct business through meetings convened three times per year.
- At the first meeting of the PB, the PB members will review this TOR and the PB membership, and adopt changes as appropriate
- The National Project Manager will organize the meetings and act as Secretary and will prepare and distribute all concerned documents in advance of meetings, including the meeting agenda.
- In between meetings, PB business will be conducted through e-mail, coordinated by the Project Manager

Input

At least 3 formal meeting per year through the duration of the project.

Annex 10 - Evaluation Consultant Code of Conduct and Agreement Form

Evaluators:

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, and must ensure that sensitive information cannot be traced to its source. Evaluators are not expected to evaluate individuals, 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. In line with the UN Universal Declaration of Human Rights, evaluators must be sensitive to and address issues of discrimination and gender equality. 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 imitations, findings and recommendations.
7. Should reflect sound accounting procedures and be prudent in using the resources of the evaluation.

Evaluation Consultant Agreement Form[95]

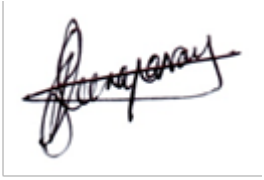
Agreement to abide by the Code of Conduct for Evaluation in the UN System

Name of Consultant: __Prakash (Sanju) Deenapanray____

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 *La Gaulette, Mauritius* on *26 February 2015*



Signature: _____

[95] www.unevaluation.org/unegcodeofconduct

Annex 11 – Evaluation Report Clearance Form

(to be completed by CO and UNDP GEF Technical Adviser based in the region and included in the final document)

Evaluation Report Reviewed and Cleared by
UNDP Country Office
Name: _____
Signature: _____ Date: _____

UNDP GEF RTA
Name: _____
Signature: _____ Date: _____

Annex 12 – UNDP-GEF TE Report Audit Trail – PIMS 2129

(Please see attached document labelled ‘Annex 12 – UNDP-GEF TE Report Audit Trail – PIMS 2129.docx)

Annex 13 – GEF Tracking Tool – PIMS 2129

(Please see attached the Excel file labelled ‘Annex 13 – TWED – Tunisia – GEF Tracking Tool – PIMS 2129.xlsx’).

Prepared by:

Dr Prakash (Sanju) Deenapanray
Director, ELIA – Ecological Living In Action Ltd
74, Societe La Fleche
La Gaulette
Mauritius

(sanju@ecolivinginaction.com)
(Tel : +230 5924 3395)