United Nations Development Programme
Country: Tunisia
PROJECT DOCUMENT[1]

Project Title:	NAMA Support for the Tunisian Solar Plan
UNDAF/CPD Outcome(s):	Outcome 3: By 2019, the State has put in place a new economic and socially-equitable development model that is inclusive, sustainable and resilient, and generating wealth and jobs. Outcome 4: By 2019, regional stakeholders generate efficiently, and use optimally, sustainably and inclusively, the resources in regions.
UNDP Strategic Plan Primary Outcome:	Growth and development are inclusive and sustainable, incorporating productive capacities that create employment and livelihoods for the poor and excluded.
UNDP Strategic Plan Related Outputs:	Output 1.4: Scaled-up action on climate change adaptation and mitigation across sectors which is funded and implemented. Output 1.5: Inclusive and sustainable solutions adopted to achieve increased energy efficiency and universal modern energy access (especially off-grid sources of renewable energy).
Expected CPD Output:	Output 4.3: Strategies for low-carbon development based on improved energy efficiency are supported at the national and local levels.
Expected CPAP Output(s):	The CPAP is being developed.
Executing Entity/Implementing Partner:	National Agency for Energy Conservation of Tunisia (Agence Nationale pour la Maîtrise de l'Energie, ANME)
Implementing Entity/Responsible Partners:	United Nations Development Programme - Tunisia

Brief Description

The UNDP-implemented, GEF-financed project will support the Government of Tunisia to develop a Nationally Appropriate Mitigation Action (NAMA) for the Tunisian Solar Plan – i.e. a TSP NAMA. Technology-specific NAMA action plans will be developed for wind energy, solar photovoltaic (PV) energy and concentrated solar power (CSP) to achieve a transformation in the electricity mix such that 30% of Tunisia's electricity is generated from renewable sources by 2030. The project will build upon existing NAMA-preparedness and new market mechanism initiatives, and national development policies. The project will develop the NAMA architecture and enabling conditions through a combination of policy and financial de-risking instruments, which will be validated through the implementation of two baseline projects (10 MW PV and 24 MW wind). The project will contribute to the country's attainment of its voluntary mitigation targets in the energy sector, with expected direct emission reductions of 218,900 tonnes of CO_{2e} during the project's lifetime and additional indirect emission reductions of ~5.34 million tCO_2e. The TSP NAMA will also generate national benefits related to green growth, energy security and job creation.

[1] For UNDP supported GEF-funded projects, as this includes GEF-specific requirements

Programme Period:	2014-2019
Atlas Award ID:	00081769
Project ID:	00090941
PIMS #	5182
Start date:	October 1, 2014
End Date:	October 1, 2019
Management Arrangements:	NIM
PAC Meeting Date	______________

Total resources required	$US 68,935,608
Total allocated resources:	
o GEF	$US 3,552,968
Other parallel funding (cash/in-kind):	
o ANME (cash)	$US 14,506,640
o ANME (in-kind)	$US 200,000
o MELPSD (cash)	$US 100,000
o Enerciel (cash)	$US 33,476,000
o STEG (cash)	$US 16,500,000
o UNDP (cash)	$US 600,000
Total Co-Financing:	$US 65,382,640

Agreed by (Government):

Date/Month/Year

Agreed by (Executing Entity/Implementing Partner):

Date/Month/Year

Agreed by (UNDP):

Date/Month/Year

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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
DNA	Designated National Authority (CDM)
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
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
KfW	Kreditanstalt für Wiederaufbau
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
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
SD	Sustainable Development
SDM	System Dynamics Modelling
SME	Small & Medium-Sized Enterprise
SNC	Second National Communication to the UNFCCC
STEG	Societé Tunisienne de l'Electricité et du Gaz
tCO_2	tonnes of carbon dioxide
TAP	Technology Action Plan
TNA	Technology Needs Assessment
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
WRI	World Resources Institute

1. SITUATION ANALYSIS

1.1. NAMA Context, Global and National Significance

1.1.1. Climate change mitigation

'Mitigation', in the context of climate change, is a human intervention to reduce the sources or enhance the sinks of greenhouse gases (GHGs). Mitigation, together with adaptation to climate change, contributes to the objective expressed in Article 2 of the United Nations Framework Convention on Climate Change (UNFCCC) to stabilise "greenhouse gas concentrations in the atmosphere at a level to prevent dangerous anthropogenic interference with the climate system…within a time frame sufficient to allow ecosystems to adapt…to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner".

The stabilisation of the climate system will require large-scale reductions in atmospheric GHGs through a combination of mitigation and removal by sinks. **Figure 1** shows that the current emission pathway is not sustainable in the context of limiting global temperature rise to within 2°C. Even the best scenarios of emission reduction pledges in the Copenhagen Accord and Cancun Agreements will leave an emissions gap that will prevent stabilisation of atmospheric GHGs for the 2°C target.[2] Ad hoc or project-based approaches to reducing GHG emissions are no longer sufficient to achieve the scale of reductions required to stabilise emissions by 2050. Nationally Appropriate Mitigation Actions (NAMAs), embodying systemic or sector-wide approaches to emission reductions, are considered an effective means of achieving the scale of mitigation required.

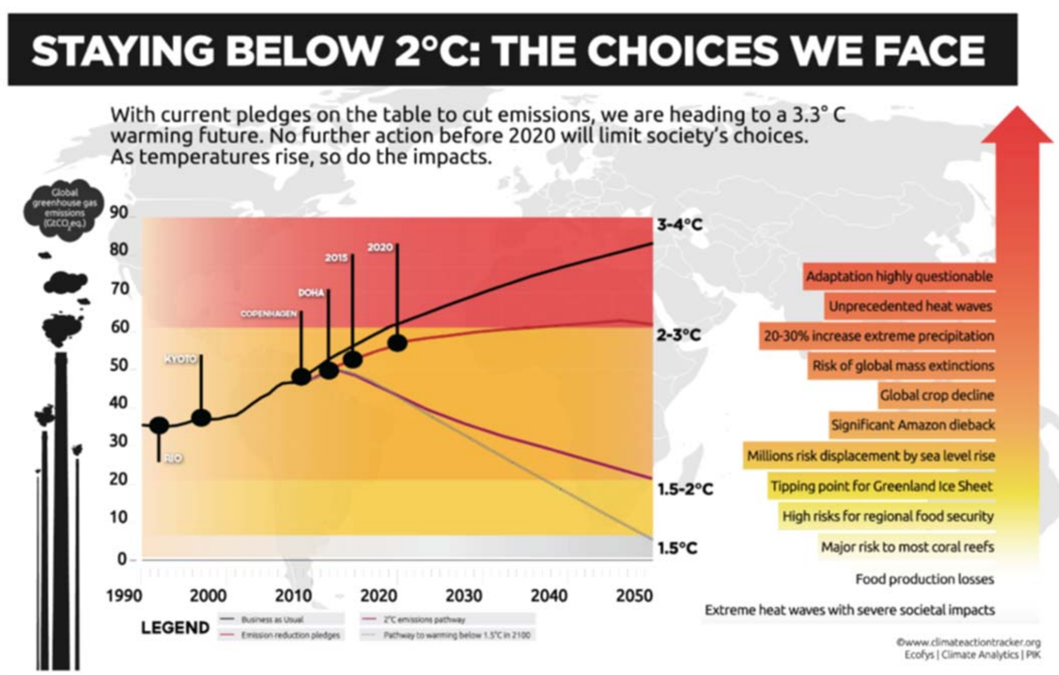

Figure 1. Emission pathways for different increases in average global temperatures (Source: Höhne, N. *et al*. (2012). *Warnings of Climate Science – Again – Written in Doha Sand.* Ecofys, Climate Analytics & PIK).

However, the financial sums involved in a rapid shift to low-emission energy pathways are significant, and leveraging such financing in a timely manner is a challenge. For example, in the

[2] Höhne, N. *et al*. (2012), 'National GHG emissions reduction pledges and 2°C: comparison of studies', *Climate Policy, 12:3,* 356-377.

energy sector, UNDESA has estimated that it would cost up to $US 250-270 billion per year to shift developing countries to 20 percent renewable energy by 2025. Similarly, according to the Global Energy Assessment, global investment in energy efficiency and low-carbon energy generation will need to increase to between $US 1.7-2.2 trillion per year – compared to present levels of about $US 1.3 trillion per year – over the coming decades to meet the combined challenges of energy access, energy security and climate change.[3]

The promising outlook is that the private sector and the global capital markets, representing some $US 212 trillion in financial assets, including $US 71 trillion managed by institutional investors, in principle have the size and depth to step up to this investment challenge. If countries are going to successfully scale-up low-emission energy systems, including the use of renewable energy, it is clear that private sector investment must be at the forefront. A direct link is established in the design of the UNDP-implemented, GEF-financed project between investments in low-carbon energy systems (driver) and GHG emission reductions (outcome). A further link that will be made in Section 1.6 is that the cost of capital to implement low-emission energy systems, such as renewable energies, depends on the level of risk that is generated by barriers. More and higher barriers to the implementation of low-carbon energy systems increase the cost of capital by increasing the risks to investments. All else being equal, the higher risks reduce the financial attractiveness of investments in low-emission systems, thereby preventing or slowing down the required transformation in energy systems.

1.1.2. Nationally Appropriate Mitigation Actions (NAMAs) under the UNFCCC

The concept of Nationally Appropriate Mitigation Actions (NAMAs) was introduced in the Bali Action Plan in 2007 (Decision 1/CP.13). The parties to the United Nations Framework Convention on Climate Change (UNFCCC) called for “Enhanced national/international action on mitigation of climate change” including “Nationally appropriate mitigation actions by developing country Parties in the context of sustainable development, supported and enabled by technology, financing and capacity-building, in a measurable, reportable and verifiable manner” (paragraph 1(b) (ii)).

Decision 2 CP/15 on the Copenhagen Accord noted that “nationally appropriate mitigation actions seeking international support will be recorded in a registry along with relevant technology, finance and capacity building support. Those actions supported will be added to the list in appendix II. These supported nationally appropriate mitigation actions will be subject to international measurement, reporting and verification in accordance with guidelines adopted by the Conference of the Parties” (paragraph 5). NAMAs were seen as a means to achieve the “deep cuts in global emissions required according to science” to hold the increase in global temperature below 2 degrees Celsius” (Decision 2/CP.15, paragraph 2).

As part of the Cancun Agreements (CoP 16), the Parties further agreed that “developing country Parties will take nationally appropriate mitigation actions in the context of sustainable development, supported and enabled by technology, financing and capacity-building, aimed at achieving a deviation in emissions relative to ‘business as usual’ emissions in 2020” (Paragraph 48). Likewise, the agreements took note of the first NAMAs formally communicated by the Parties (paragraph 49). The Cancun Agreements also differentiated between NAMAs that were domestically supported and those that were internationally supported, specifying that both were subject to being monitored, reported and verified domestically, but that the latter would be subject to international monitoring, reporting and verification (MRV).

Decision 2/CP.17 (paragraph 46) provides guidance to non-Annex 1 countries on what information should be contained in the submission of Parties to the NAMA Registry. NAMAs seeking international support should cover the following:

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[3] Waissbein, O., Glemarec, Y., Bayraktar, H., & Schmidt, T.S., (2013). *Derisking Renewable Energy Investment: A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries.* New York, NY: United Nations Development Programme, pg. 28 (and references therein). Can be accessed at www.undp.org/DREI.

(a) A description of the mitigation action and the national implementing entity, including contact information;
(b) The expected time frame for the implementation of the mitigation action;
(c) The estimated full cost of preparation;
(d) The estimated full cost and/or incremental cost of implementation of the mitigation action;
(e) The amount and type of support (financial, technology and capacity-building) required to prepare and/or implement the mitigation action;
(f) The estimated emission reductions;
(g) Other indicators of implementation;
(h) Other relevant information, including the co-benefits for local sustainable development, if information exists.

Unilateral (or domestically-funded) NAMAs should also be submitted for recording in a separate section of the registry (Decision 2/CP.17, paragraph 47). At CoP 17, the Ad Hoc Working Group on Long-term Cooperative Action made way for sectoral approaches as a means of up-scaling GHG emission reductions (Decision 2/CP.17, paragraph 74).

CoP 18 in Doha (November-December 2013) culminated in the adoption of the Doha Climate Gateway and confirmed a new climate regime to be adopted in 2015 and to be implemented as of 2020, pending completion of decisions relating to NAMA implementation by SBI (UNFCCC Implementation body) between 2013 and 2014.

Finally, although NAMAs represent a central means of reducing GHG emissions in developing countries, international negotiations have neither provided a formal definition of the information that should be included in a NAMA document nor clarified some key aspects, including the international MRV mechanisms and guidelines required. It is expected that these aspects will be progressively clarified in a bottom-up manner based on the experience of the countries that draft and implement NAMAs.

The integrated or systemic approach for delivering a higher level of emission reductions (the transformational role of NAMAs) is more clearly formulated in the decisions made at CoP 19 (November 2013). Paragraph 5 of Decision 1/CP.19 calls for "intensifying, as from 2014, the technical examination of opportunities for actions with high mitigation potential, including those with adaptation and sustainable development co-benefits, with a focus on the implementation of policies, practices and technologies that are substantial, scalable and replicable, with a view to promoting voluntary cooperation on concrete actions in relation to identified mitigation opportunities in accordance with nationally defined development priorities".

1.1.3. NAMAs in application

From the above decisions, a NAMA can be considered to be a mitigation action tailored to the national context and capabilities (according to the 'common but differentiated' approach), which is in accordance with national sustainable development priorities. NAMAs are typically implemented to incentivise mitigation on a long-term basis at a sector-policy level to reduce emissions permanently. In order to operationalise NAMAs at the national level, it is important to distinguish two dimensions of NAMAs.[4]

(1) The first differentiation of NAMAs, also in the NAMA Registry, is made according to the source of financing:
- Unilateral NAMA (for recognition): entirely financed by the host country;
- Supported NAMA: enabled in part by international technology, financing and/or capacity building.

[4] UNEP. (2013), *Guidebook for the Development of Nationally Appropriate Mitigation Actions on Efficient Lighting*, UNEP DTIE: Paris.

Although there exists a possibility of linking emission reductions resulting from NAMAs to carbon markets through credited NAMAs, no international agreement to date recognises credited NAMAs.

(2) The second differentiation is made between policy or programme NAMAs, and project NAMAs.

- Policy or programme NAMAs are interventions implemented by a government in order to promote or discourage technology options at the country or sector level, impact economic activity or change consumer behaviour to achieve sustainable low-carbon development. An example would be establishing feed-in-tariffs to promote different types of renewable energy (RE);

- Project NAMAs are specific activities undertaken by private or public organisations that are clearly limited in duration, scope and geography. Project NAMAs encompass defined activities, which typically require technology investments such as the installation of a wind farm.

The increasing emphasis on NAMAs to be ‘transformational’ implies a clear preference for a programmatic approach (e.g. decisions of CoP 18 and CoP 19). Further, supported NAMAs offer a new avenue to channel international financial, technological and capacity building support.

As such, a practical understanding is now emerging of the core components of a supported NAMA addressing the power sector in a developing country. Such a NAMA will likely include:

- A **voluntary long-term, time-bound investment target** for low-carbon activities in the power sector. A breakdown of the target will be provided by technology (installed capacity, target years).

- The identification and implementation of **a package of public instruments** to create an enabled environment to attract this targeted investment. The investment will come from a mix of public and private sources, with the majority of investment coming from the private sector.

- A breakdown of the **anticipated costs and incremental costs** to achieve the NAMA’s investment target, differentiated between financing sources: public and private, domestic and international, as well as market mechanisms (e.g. carbon markets). Limited public finance will be used to catalyse far larger quantities of private investment.

- An assessment of the anticipated **socio-economic and environmental co-benefits** that will arise from the targeted investment, including economic growth, job creation and sustainable development benefits.

- An **MRV framework,** with appropriate indicators, to measure, report and verify the emission reductions that will be generated by the investment in low-carbon activities under the NAMA.

These components inform the design of the supported NAMA to transform the power sector in Tunisia that forms the core of the UNDP-implemented, GEF-financed project.

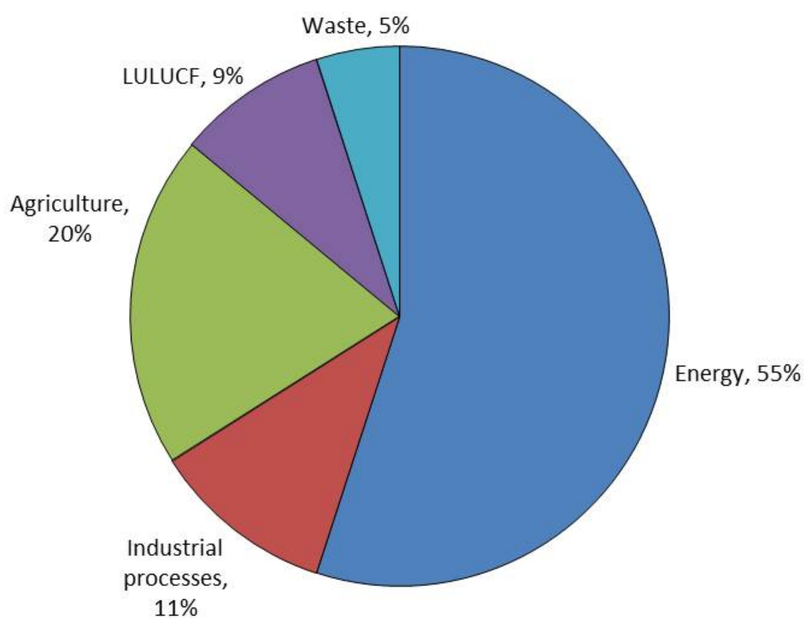
1.1.4. Tunisia’s voluntary mitigation actions

Tunisia is 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 NAMAs), technology transfer and capacity building, and that developing projects under the CDM would not be excluded. This last qualification has implications in this project for developing an MRV system that avoids double-counting of emission reductions from the power sector. The NAMAs submitted by Tunisia to the UNFCCC Secretariat are listed in Annex 7.1, and include the three constituent technologies – wind, solar photovoltaics (PV) and concentrated solar power (CSP) – of the Tunisian Solar Plan.[5] It is noted that Tunisia has not yet submitted any NAMAs to the NAMA Registry for financial support.[6] The UNDP-implemented, GEF-financed project will therefore support Tunisia in developing a robust NAMA for the power sector that will have all the attributes (see outcomes of CoP17 discussed above) for submission to the NAMA Registry. It is worthwhile to note that there are several NAMAs that are ready and have been promoted in other fora. For instance, the cement industry project (see Section 1.3.2.1) has succeeded in facilitating access to the Partnership for Market Readiness (see Section 1.3.2.2); and the building NAMA (see Section 1.3.2.1) is being prepared to be submitted to the UK-German NAMA Facility.

1.2. The Energy Sector in Tunisia

1.2.1. Emissions from the energy sector

The energy sector is by far the largest source of GHG emissions in Tunisia, accounting for 55% of the country's total GHG emissions (20.781 $MtCO_2e$ in 2000).[7] The sectoral contributions to GHG emissions are shown in **Figure 2**. In 1994, GHG emissions from the energy sector were 15.251 $MtCO_2e$, implying a significant increase of 36.3% (or ~5.3% compound annual growth rate, CAGR) between 1994 and 2000.



[5] Please see http://unfccc.int/files/meetings/cop_15/copenhagen_accord/application/pdf/tunisiacphaccord_app2.pdf - accessed 24 May 2014.
[6] Please see http://www4.unfccc.int/sites/nama/SitePages/Country.aspx?CountryId=178 – accessed 24 May 2014.
[7] Republic of Tunisia, (2013), *Second National Communication under the United Nations Framework Convention on Climate Change*, Ministry of Equipment and Environment: Tunis (http://unfccc.int/resource/docs/natc/tunnc2.pdf - accessed 26 May 2014).

Figure 2. Emission of GHG by Sector, 2000 (Source: Second National Communication (SNC), 2013, pg. 46).

The sub-sector breakdown of GHG emissions from the energy sector for 2000 is shown in **Table 1**. The emissions from the energy industries (i.e. power generation) are the highest and represent 27.2% of all energy sector emissions and 30.1% of combustion-related GHG emissions.

Table 1. Breakdown of the energy sector GHG emissions, 2000 (Source: SNC, pg. 47)

Energy sub-sector	Emissions ($MtCO_2e$)	(%)
Energy industries	5.6426	27.2
Manufacturing, mining & construction	4.2565	20.5
Transport	5.1587	24.8
Tertiary	0.5568	2.7
Residential	1.9562	9.4
Agriculture, fisheries & forests	1.1451	5.5
Sub-total combustion	***18.7159***	***90.1***
Sub-total fugitive emissions	***2.0655***	***9.9***
Total emissions energy sector	**20.7814**	**100.0**

The GHG emissions from the energy sector in 2009 are estimated as being approximately 29 $MTCO_2e$, representing an increase of 39.6% relative to the emissions in 2000 (or ~3.8% CAGR).[8] Although absolute emissions increased between 1994 and 2009, the compound annual growth rate (CAGR) of emissions fell from 5.3% between 1994 and 2000 to ~3.8% between 2000 and 2009. A comparison with the annual change in economic growth reveals a decoupling of GHG emissions and GDP growth over the same period. Between 1990 and 2001, GDP grew at an average of 4.76% per annum (pa), and it was relatively unchanged at 4.74% between 2001 and 2007.[9]

The change of emissions is mirrored by the compound annual reduction in the carbon intensity of the economy by ~1% between 1980 (1.482 tCO_2e/1000 TD) and 2008 (1.105 tCO_2e/1000 TD). The reduction in carbon intensity accelerated to 2.1% pa after 2000.[10] The general fall in the carbon intensity of the economy is attributable to four factors, namely: (1) a gradual reorientation of the economy towards less energy-intensive sectors; (2) an increase in energy efficiency, mainly in the manufacturing sector; (3) increased use of natural gas; and (4) the use of combined-cycle turbines in power generation.[11] The trend in energy intensity is shown in **Figure 3**.

[8] Ibid., pg. 88.
[9] Ibid., pg. 92.
[10] Ibid., pg. 93.
[11] Ibid., pg. 93.

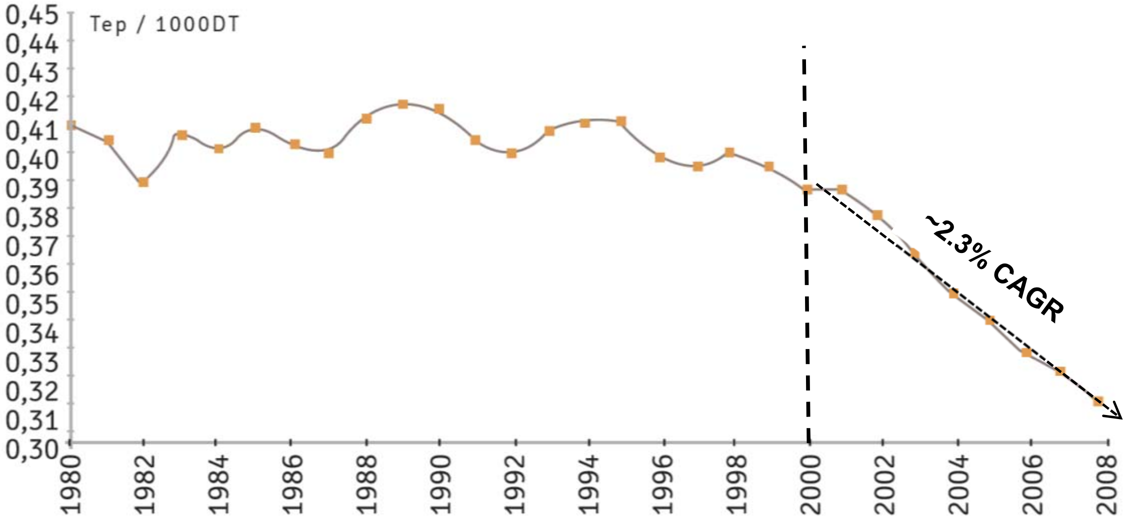


Figure 3. Variation in energy intensity in toe/1000 TD, 1980-2008 (Source: SNC, pg. 97).

According to the SNC, GHG emissions from the energy sector are expected to reach 30 $MtCO_2e$ in 2016 and 60 $MtCO_2e$ in 2030.[12]

1.2.2. 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 pa 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.[13] The ratio of national primary energy production to consumption fell from 120% to 80% between 1990 and 2012. **Figure 4** 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.

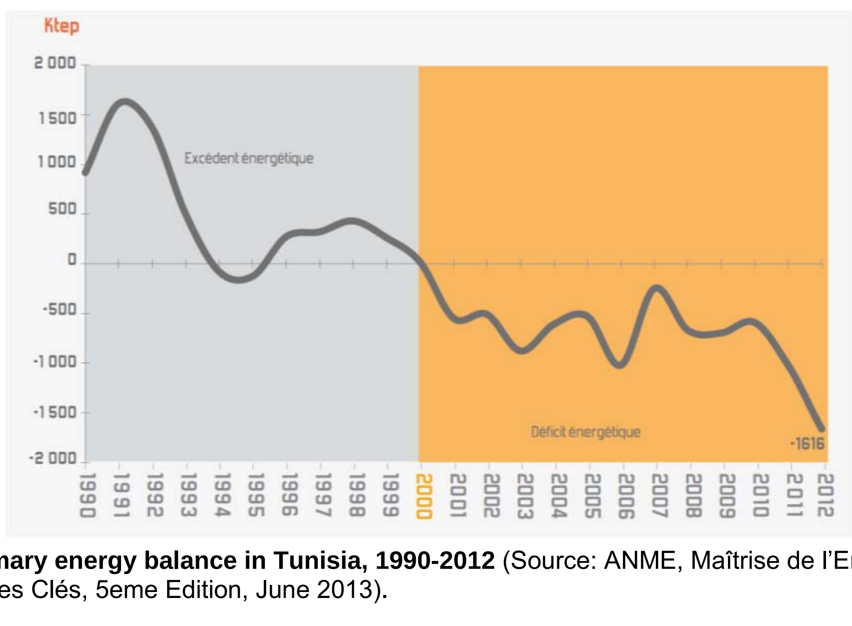


Figure 4. Primary energy balance in Tunisia, 1990-2012 (Source: ANME, Maîtrise de l'Energie en Tunisie, Chiffres Clés, 5eme Edition, June 2013).

[12] Ibid., pp. 98-99.
[13] 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.

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.[14]

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)[15], 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.[16]

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.[17] 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.[18] Similar electricity subsidy reforms will be extended to other sectors over the next 3 to 6 years.

1.2.3. Electricity production and demand

Tunisia has achieved almost universal access to electricity (>99.5%). The generation and consumption of electricity are shown in **Figure 5** and **Figure 6**, respectively. **Figure 5** 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.[19] 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.[20] At the end of 2012, the installed capacity of RES was estimated at 250 MW while total installed capacity was 4,117 MW.[21]

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 6**). 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.[22]

[14] Ibid., pg. 9.
[15] 1 TD = 0.449 €.
[16] http://www.tradingeconomics.com/tunisia/government-budget - accessed 30 May 2014.
[17] World Bank (2013), *Vers une Meilleure Equité: les Subventions Energétiques, le Ciblage et la Protection Sociale en Tunisie*, rapport n. 82712-TN.
[18] 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.
[19] 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.
[20] Benedetti *et al*. (2013). *Tunisia Energy Country Report: Focus on Electricity Sector and Renewable Energy Policies*, GSE: Rome.
[21] Perspectives Climate Change (2014), *Analyse des Possibilités NAMA dans le Secteur d'électricité Renouvelable,* pg. 10.
[22] ANME-GIZ (2012), *Draft National Energy Mix Strategy for the Generation of Electricity to 2020 and 2030*.

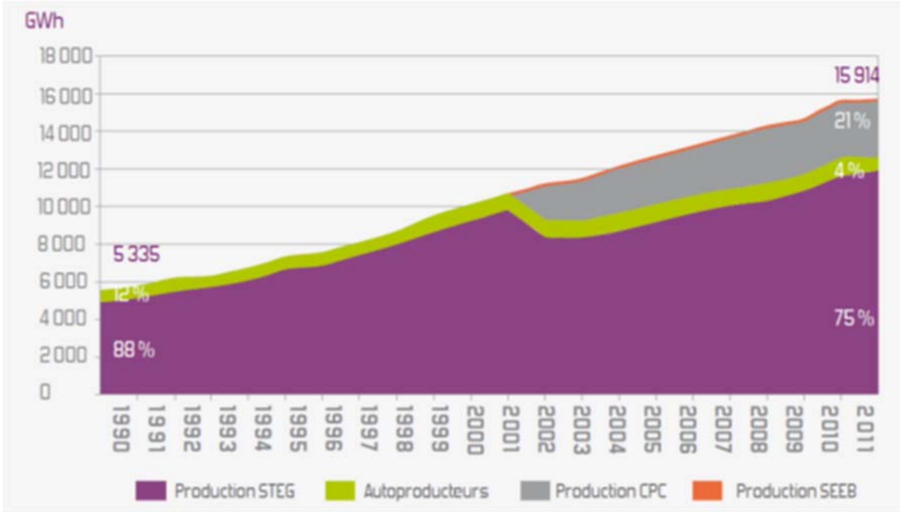


Figure 5. Electricity generation in Tunisia, 1990 – 2011 (Source: ANME, 2013).

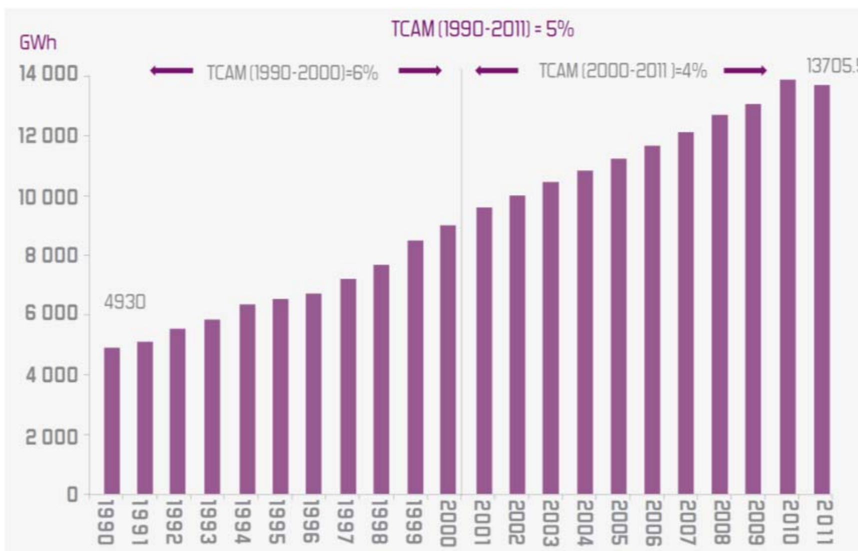


Figure 6. Electricity consumption in Tunisia, 1990 – 2011 (Source: ANME, 2013).

1.2.4 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)[23] 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.[24] 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 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

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

resources; (2) the technical and commercial maturity of renewable technologies; and (3) projected reductions in the costs of these technologies.[25] The installed capacity and expected electricity generation arising from the TSP are shown in **Table 2**.

Table 2. 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 7**. 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.[26] According to the TSP, CSP is expected to be implemented from 2020 onwards.

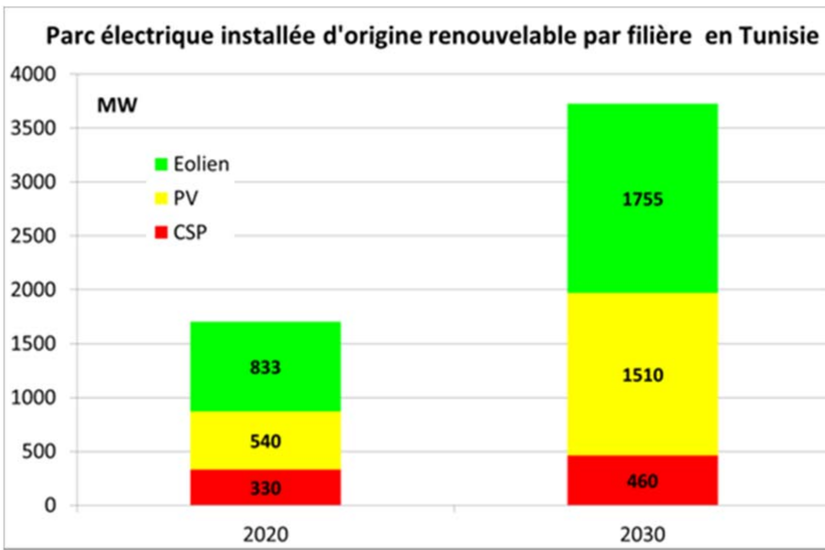


Figure 7. Installed capacity of wind, PV and CSP in the TSP: 2020 & 2030 (Source: ANME, 2013).

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.[27] 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.

1.2.4.1. Sustainable development dividends of the TSP

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:[28]

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[25] 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.
[26] Ibid., pg. 16.
[27] The investments are measured in 2012 €, and are equivalent to € 3,186 million in present (2012) value using a discount rate of 8%.
[28] ANME (2013), *Stratégie Nationale du Mix Energétique pour la Production Electrique aux Horizons 2020 et 2030: Choix,*

- 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.[29] The TSP is also intended to catalyse green investment that will contribute to economic growth, the creation of green jobs and technology transfer. The TSP envisages 20% of renewable electricity being exported to North African and European countries, and is specifically aligned with the regional 'super-grid' vision of the Mediterranean Solar Plan and Desertec.

1.2.4.2. Legal framework to promote renewable energy and the efficient use of energy

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 8** shows the different taxes, including the registration of first car ownership (70%), air-conditioning equipment (25%) and incandescent lamps (4%), that are used to capitalise the FNME (4%).

Figure 8. 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. **Figure 9** shows the disbursements allocated to these interventions. In 2012, the FNME was capitalised to the sum of TND 30 million (or ~US$18.5 million), and the total disbursements were TND 17 million (or ~US$ 10.5 million). At the end of 2012, the balance of the Fund was TND 53.5 million (or ~US$ 32.9 million).[30]

Impacts et Conditions d'Opérationnalisation, Ministère de l'Industrie, Tunis. pp. 22-27.
[29] Ibid. p. 22.
[30] ANME (2013), *Maîtrise de l'Energie en Tunisie, Chiffres Clés*, 5eme Edition, Ministère de l'Industrie, Tunis. pg. 28.

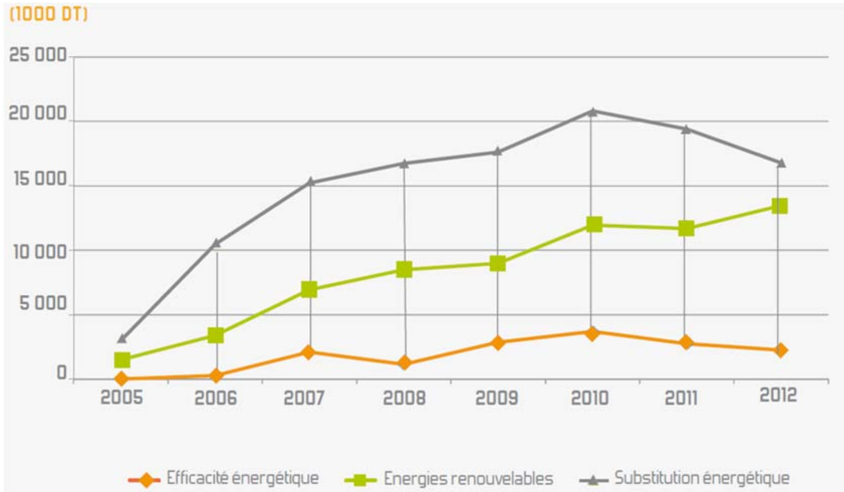

Figure 9. Disbursements of FNME funds: 2005 – 2012 (Source: ANME, 2013).

As of January 2014, the FNME has been transformed into the Energy Transition Fund (ETF)[31], 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.[32] The ETF will be capitalised by two additional sources of tax on: (i) energy products consumed;[33] 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. Since the ETF may also not be able to leverage the levels of financing required for implementing the TSP, the Agence Nationale pour la Maîtrise de l'Energie (ANME) has commissioned a study to investigate options for significantly increasing the capitalisation of the Fund, diversifying the type of interventions away from grants only (to include, for example, credit lines, investment funds and concessional interest rates), and to rationalise the management of the Fund. The rationale underlying these changes is that the transformation of the power sector, and the ultimate global environmental benefit of reductions in GHGs, is primarily constrained by a lack of scaled-up investments due to the existence of barriers. Based on a systematic analysis of these barriers (Section 1.3), the UNDP-implemented, GEF-financed project will support the EFT to diversify its sources of capitalisation in order to implement the TSP. The Government fully supports the project's efforts in this regard (see letter of support in Annex 7.5).

The regulations governing the production of electricity from RES 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.[34]

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[31] Government of Tunisia (2014), *Tunisia: Letter of Intent, Memorandum of Economic and Financial Policies, and Technical Memorandum of Understanding*. pg. 6.

[32] See http://www.finances.gov.tn/index.php?option=com_jdownloads&view=viewcategory&catid=9&Itemid=306&lang=fr – accessed 4 June 2014.

[33] The list of energy products and the means of tax recovery will be established by Decree.

[34] 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.

- A proposed new law on the generation of electricity from renewable energies that has been sent to the National Constituency Assembly (NCA) for adoption and proclamation. It has approved by the Commission on Energy and Productive Sectors at the NCA at the end of July 2014. It will now be discussed in the plenary session at the NCA.[35] 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 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.

1.2.4.3. Tunisia's CDM experience, a stepping-stone for scaled-up action

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.[36] 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.[37] 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).[38] The specific context of Tunisia favours a programmatic or sectoral approach, such as that embodied in NAMAs (Section 1.3.2.2).

1.2.4.4. Institutional framework of the power sector[39]

This section reviews the principal institutional players in the power sector. The stakeholders that have been directly involved in the design and conceptualisation of this project, and which will be involved in its implementation, are discussed in Section 1.4.

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[35] Jihene Touil, personal communication by email – 6 August 2014.

[36] Information obtained from http://cdmpipeline.org/ - accessed 4 June 2014.

[37] KfW Bankengruppe (2011), *How to Develop a NAMA by Scaling-Up Ongoing Programmatic CDM Activities: On the Road from PoAs to NAMAs*.

[38] Presentation made by ANME on the "Organising framework for scoping of PMR activities", 14 February 2014, Mexico.

[39] Benedetti *et al*. (2013), *Tunisia Energy Country Report: Focus on Electricity Sector and Renewable Energy Policies*, GSE: Rome, pp 9-10.

Ministry of Industry

The Ministry of Industry's mission is to develop and implement Government policy in areas related to industry, industrial services, energy, mining, industrial cooperation and industrial safety. Within the Ministry, the Department of Electricity, Gas and Energy Efficiency is responsible for the coordination and implementation of energy policies; this role is shared with ANME. Moreover, the Ministry supervises STEG in the production, transport and distribution of electricity and gas.

Commission Supérieure de la Production Indépendante d'Electricité - CSPIE (High Commission for Independent Power Production, HCIPP)

The CSPIE was established in 1996 for establishing the conditions and procedures for granting electricity concessions to IPPs. According to law, the Commission must decide:

- The mode and conditions of selection;
- If applicable, the list of candidates to be selected for the restricted tender following the public call for tender;
- The identification of the independent power producer after the opening of bids;
- The benefits to be granted to the concessionaire;

The CSPIE is composed of senior members of the Tunisian Government, including the Prime Minister, the Minister for International Cooperation and Foreign Investment, the Minister of Finance, the Minister of Economic Development, the Minister of Environment and Spatial Planning, the Minister of Trade, the Minister of Industry, the Cabinet Secretary and the Governor of the Central Bank of Tunisia.

Commission Interdépartementale de la Production Indépendante d'Electricité – CIPIE (Inter-departmental Commission for Independent Power Production)

The CIPIE was established under the Ministry of Industry in 1996 for stipulating the conditions and procedures for granting electricity concessions to private sector companies. It is composed of one representative from each member organisation of the CSPIE/HCIPP and STEG. The CIPIE is tasked with:

- Proposing any extension of concession benefits;
- Commenting on tender documents and establishing award criteria;
- Reviewing reports and examining tenders submitted for decision to the CSPIE;
- Monitoring the negotiations for the award of the concession; and
- Considering any matter relating to the implementation of the project which is submitted by the Minister of Industry.

Société Tunisienne de l'Electricité et du Gaz - STEG (Tunisian Company for Electricity and Gas)

The generation, transmission, distribution, import and export of electricity and gas were nationalised in 1962 and entrusted to STEG under the guidance of the Ministry of Industry. The monopoly on power generation was ended in 1996 with the establishment of the first IPP. STEG remains the single largest power generator in Tunisia, the sole buyer of electricity, and retains complete control of power transmission and distribution.

Agence Nationale pour la Maîtrise de l'Energie – ANME (National Agency for Energy Conservation, NAEC)

ANME was established in 1985 under the aegis of the Ministry of Industry. Its mission is to implement Government energy policy and, in particular, measures relating to energy efficiency and renewable energy. The areas of intervention of ANME are (among others):

- Participating in the development and implementation of national energy policy;
- Conducting studies on mitigation actions related to energy consumption;
- Administration of the former Fonds National de Maîtrise de l'Energie (FNME);
- Proposing legal and regulatory frameworks for energy management;

- Granting tax and financial incentives;
- Preparation and implementation of awareness-raising, information, education and training on energy conservation;
- Providing support to research and development demonstration projects;
- Supporting the development of industry by encouraging investment in the energy sector.

1.3. Baseline Projects and Baseline Supporting Activities

1.3.1 Baseline projects

Under the framework of the TSP, a number of investment projects have been identified and are expected to be implemented through a combination of public and private financing. For the purposes of the UNDP-implemented, GEF-financed project, two baseline projects have been identified as being representative of the TSP, especially within the 2020 time horizon. These baseline projects together (a) address two of the three renewable energy technologies covered by the TSP (wind and solar PV, which together constitute ~88% of the total RE installed capacity envisaged under the TSP), and (b) cover both public-sector and private-sector investments.

The first such project is the 10 MW PV plant at Tozeur, for which a feasibility study has been completed.[40] The investment cost for this PV plant is €12 million (US$16.5 million). This project will be implemented on an area of 20 ha owned by the Government. With solar insolation of 2,006 kWh/m^2/year at the proposed site, the expected PV-generated electricity is 16.9 GWh/year.[41] The Tozeur PV plant will be implemented in 2015.[42]

The other baseline project is a 24 MW wind farm (phase 1 of a 45 MW facility) that was initially being developed for implementation under Decree 2009-2773 for auto-production at the Gabes cement factory using private investment totaling €25 million (US$33.5 million). This project will now be implemented under the forthcoming renewable energy law discussed in Section 1.2.4.2. The wind farm is expected to generate 86.4 GWh annually.[43]

The two baseline projects also reflect the vastly different climatic conditions in which renewable energy installations must operate in Tunisia. Whereas the wind farm at Gabes is situated in the temperate zone of the Mediterranean Sea, the PV plant will be located in Tozeur, an oasis in south-west Tunisia. Tozeur is, in fact, adjacent to the Sahara Desert that covers the southern part of Tunisia. Discussions with STEG have indicated that renewable electricity installations, specifically PV and CSP installations, in the southern regions of Tunisia will be exposed to sand-blasting and the harsh desert environment. As will be discussed below, the investment component of the UNDP-implemented, GEF-financed project will cater for proofing the PV plant against the desert climatic conditions. Tozeur and Gabes are in high RE resource locations in Tunisia, as shown in **Figure 10**.

[40] Lahmeyer International and STUDI (2012), *Étude de Faisabilité PV*.
[41] All data has been supplied by STEG through a project summary sheet.
[42] Meeting with Mr Harrabi, STEG, 11 December 2013.
[43] UPC Renewables/ EnerCiel Tunisie (2012), *Centrale Eolienne de la Société des Ciments de Gabes (SCG) Kechabta 45 MW*.

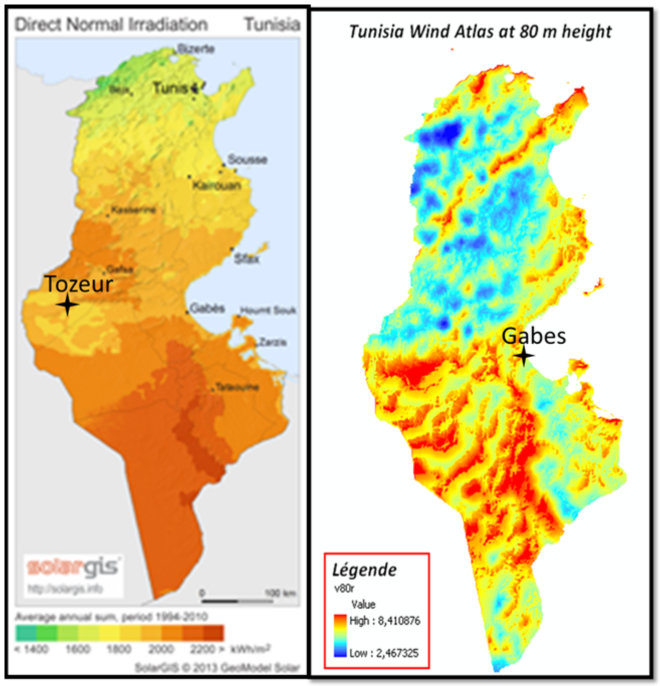

Figure 10. Locations of Tozeur (left) and Gabes (right).

As discussed in Section 2, all of the technical assistance components of the UNDP-implemented, GEF-financed project have been designed to enhance the successful implementation of the baseline projects. The incremental reasoning relating to the baseline projects is detailed in Section 2.2. In brief, the baseline projects are expected to be implemented in the absence of the UNDP-implemented, GEF-financed project but with known deficiencies. The principal deficiencies have been identified as being: no planned use of PV technologies that are designed to operate in desert climatic conditions in the case in Tozeur, and no planned use of adequate interface electronics to match the technical characteristics of renewable electricity produced by the baseline projects to those of grid electricity. The investments under Component 3 of the project will address these technological and technical issues to enhance the performance of the baseline projects and thereby ensure delivery of the expected global environmental benefits (see Section 2.4). The incremental reasoning is also related to scaled-up mitigation action in the power sector – i.e. to the TSP – through the removal of barriers for catalysing investments required to implement renewable energy technologies in Tunisia. As is discussed in Sections 1.5, 1.6 and 2, the technical assistance components of the project propose to overcome prevailing barriers through the implementation of policy and financial de-risking instruments. Therefore, the baseline projects form the foundation on which these de-risking instruments will be designed and implemented with a view to scaling-up mitigation actions in the form of a NAMA for the power sector – i.e. a TSP NAMA.

1.3.2 Baseline Supporting Activities

Since submitting its list of voluntary mitigation actions in the context of the Copenhagen Accord in 2010 (see Annex 7.1), the Government of Tunisia has shown its commitment to mitigation measures and for developing a low-carbon economy with the objective of achieving sustainable development. In particular, several initiatives have been, or are being, carried out to increase the country's NAMA-preparedness and preparedness for New Market Mechanisms (NMMs). The UNDP-implemented, GEF-financed project will build on these initiatives and collaborate with existing initiatives, a number of which are managed by ANME. Further, a UNDP-implemented, GEF-financed project to promote the private sector development of wind energy in Tunisia[44], scheduled to end in 2014, has provided much guidance in designing the strategy that is discussed in Section 2. Together, these initiatives provide a strong foundation on which to design the current project, including the establishment of baselines. These complement the projections of the TSP regarding the penetration of RES in the power sector (Section 1.2.4). Further, the review and interactions with these initiatives during project design and conceptualisation have enabled very close coordination and complementarity of efforts with other development partners (this section) and other national institutions (Section 1.3.3) to be achieved. This section reviews the NAMA-enabling and NAMA-related initiatives that have taken place in Tunisia over the past 3 years, as well as complementary ongoing initiatives.

1.3.2.1. 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.[45] 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".[46] 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 $MtCO_{2e}$ 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).

The project has concluded that only an integrated and coherent mechanism for lifting of barriers will allow a transition to a lower-carbon footprint in the Tunisian cement sector and the achievement of large-scale mitigation potential. In addition to financial incentives, the lifting of regulatory, technological and behavioural barriers would be necessary to positively influence investment in mitigation by cement sector actors. The establishment of an MRV system to quantify and verify emission reductions in a transparent way would be essential to create a level playing field. In the mechanism, financial incentives will be linked to reductions in GHG emissions. Although this performance-based financial mechanism has yet to be designed, the project has proposed a combination of three elements, including rebates on investments in EE, access to concessional loans and a dedicated credit line for the sector funded by the ETF (ex-FNME). It is expected that the modalities of the performance-based mechanism will be developed under the Partnership for Market Readiness (PMR) initiative (see Section 1.3.2.2).

Building sector NAMA – Mitigation Momentum project

Tunisia is one of five countries that participated in the Mitigation Momentum project in 2013.[47] The Mitigation Momentum project is supported by BMU and aims to promote the development

[44] PMIS 967, UNDP-GEF, Private Sector Led Development of On-Grid Wind Power in Tunisia.

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

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

[47] http://www.mitigationmomentum.org/partner_countries.html - accessed 4 June 2014.

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.[48] 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.[49] 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 operationalise this NAMA Strategy for the Tunisian Solar Plan.

In 2014, a UNDP-funded study investigated the options for NAMAs in the renewable electricity sector.[50] 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 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:

- <u>The way forward</u> – 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));

- <u>MRV system</u> – 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;

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

- 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.

1.3.2.2. 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.[51] Tunisia's participation in the PMR comes in the

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

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.

The following technical support is being requested to prepare and test the performance-based mechanism in the cement industry:

- Developing the organisational, regulatory, technical and financial components;
- Developing a detailed MRV system and capacity building for cement plants;
- Negotiating the required agreements between stakeholders; and
- Piloting and testing a crediting mechanism in the sector.

The PMR initiative also includes elements relating to the energy sector NAMA, such as:

- Designing a crediting mechanism for the sector by choosing the most appropriate option (e.g. sectoral crediting, technology-based approach, NAMA crediting, etc.);
- Exploring the possibilities of linking the feed-in tariff to the carbon market by exchanging and learning from other member countries;
- Developing a detailed MRV system and supporting capacity building of the stakeholders (public and private); and
- Piloting and testing the selected crediting mechanism in the sector.

Discussions have taken place with ANME such that the UNDP-implemented, GEF-supported project will develop the MRV system for the TSP NAMA in collaboration with the PMR initiative.

Capacity development for greenhouse gas inventory and MRV in Tunisia

BMU, through the technical assistance of GIZ, is building the capacity of Tunisia (ANME) to undertake GHG inventories and to develop MRV systems for the energy sector. The project was initiated in 2013 following the recognition that, although Tunisia was developing NAMA approaches, there was an absence of robust systems by which to measure, report and verify (MRV) these mitigation measures. The project supports the establishment of a comprehensive national MRV system for mitigation measures, including GHG monitoring. More recently, the project has piloted the World Resources Institute's (WRI) Greenhouse Gas Protocol Policy and Action Accounting and Reporting Standard on the PROSOL Elec programme.[52] PROSOL Elec aims to promote and support the installation of photovoltaic (PV) systems in residential and tertiary buildings by providing financial support for the purchase of PV systems and by installing an accounting mechanism (net-metering), and forms part of the TSP. In the context of PROSOL Elec, GIZ and ANME decided to participate in the pilot testing programme in order to:

- Acquire a working knowledge of the new GHG Protocol Policies and Actions Standard and verify if the standard can be applied for the MRV of Tunisian mitigation actions, especially NAMAs and smaller programmes;
- Build capacities among the pilot testing organisations for the practical development of MRV systems; and
- Support WRI in developing the new standard.

From the beginning, the GIZ-led project has been involved in the conceptualisation of the UNDP-implemented, GEF-financed project, and lessons-learned from GIZ and ANME's GHG inventorisation and MRV project will be used to guide the implementation of the MRV system developed under the UNDP-implemented, GEF-financed project.

[52] GIZ (2014), *Technical Report on Pilot Testing World Resources Institute's Greenhouse Gas Protocol Policy and Action Accounting and Reporting Standard*. Unpublished.

1.3.2.3. Other complementary initiatives

National Climate Change Strategy (NCCS)

In 2010, Tunisia initiated a large national stakeholder consultation process which led to the development of its National Climate Change Strategy. The Strategy proposes an anticipatory approach to adaptation and a proactive mitigation policy in order to reduce the economy's carbon intensity. An ambitious quantitative goal has been formulated and is currently being updated in light of the preparation of the intended nationally determined contribution. The NCCS sees NAMAs and market-based instruments as key elements of Tunisia's mitigation policy, particularly in the energy sector. Further, it highlights the need for establishing strong governance for climate change based on appropriate institutional arrangements that will allow cross-sectoral (i.e. horizontal) interactions. Based on the principle of subsidiarity, the NCCS also proposes that the governance structure should foster better linkages between national and regional (sub-national) levels of government. A strong emphasis for both climate change mitigation and adaptation should be on job creation and poverty alleviation.[53] The NCCS also highlights the need to develop a framework to bring more coherence to the multiple interventions in climate change taking place in Tunisia. The NCCS was developed by the Ministry of Environment and supported by GIZ.

Low Carbon Development Strategy (LCDS)

UNDP is supporting ANME to mobilise resources for developing a Low Carbon Development Strategy (LCDS) for Tunisia. The LCDS will build on the initiatives discussed above, as well as the UNDP-implemented, GEF-financed project, to support a sustainable energy transition process in Tunisia through the transformation of public policies. The LCDS is expected to: (1) set ambitious goals in terms of energy efficiency, the development of renewable energies and GHG reduction; (2) suggest measures and schemes to put in place to support the energy transition while contributing to green growth, job creation and the fight against poverty; and (3) encourage citizen involvement in the energy transition process by involving civil society, promoting regional and local governance, and encouraging a responsible dialogue to adopt a sustainable energy model. In order to achieve its development objectives, the LCDS will focus on: (1) establishing regional energy governance to integrate the regions in the energy transition process; (2) reducing the energy vulnerability of poor and middle social classes; (3) promoting green growth and job creation through the energy transition; and (4) establishing a permanent dialogue on energy to increase the ownership of low-carbon development at all levels of society.

National Capacity Self-Assessment (NCSA)

Tunisia conducted an NCSA for the three Conventions through a UNDP-implemented, GEF-financed project.[54] The NCSA covered the status of regulatory and institutional frameworks; national communications; a study on vulnerability and adaptation to climate change; and potential sectoral GHG emission reduction projects. The NCSA highlights the critical role that renewable energy can play in improving Tunisia's energy security and reducing its GHG emissions, and the importance of institutional strengthening and coordination for maximising the impacts of mitigation actions.

National Communications

Tunisia submitted its Initial National Communication to the UNFCCC in 2001 and has recently finalised its Second National Communication to the UNFCCC. The UNDP-implemented, GEF-

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[53] Ministère de l'Environnement (2012), *Stratégie Nationale sur le Changement Climatique*.

[54] Republic of Tunisia, *Strategy and Action Plan for the Implementation of the Rio International Conventions: Biodiversity, Climate Change, and Desertification*. Ministry of Environment and Sustainable Development: Tunis. http://www.thegef.org/gef/sites/thegef.org/files/gef_prj_docs/GEFProjectDocuments/NCSA/Tunisia-National%20Capacity%20Self%20Assessment%20(NCSA)%20for%20Global%20Environment%20Management/NCSA%20Final%20Report.pdf – accessed 10 July 2014.

financed project is fully aligned with the SNC, notably with regard to its support to wind and solar energy, its technical support to NAMAs, and its emphasis on capacity development and institutional strengthening. Tunisia is launching its Third National Communication and is receiving GEF support to submit its first Biennial Update Report (BUR). The NCs and BUR are effective means of detailing planned and underway NAMAs, and enhancing their visibility to attract financial support. The lessons-learned from developing national GHG inventories for the NCs are useful for developing and harmonising MRV systems for NAMAs.

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

The ANME-UNDP-GEF project, Private Sector Led Development of On-grid Wind Power in Tunisia (2009-2014, US$2,000,000), represents complementary technical assistance to the project proposed here. Importantly, this GEF project does not have an investment component but is carrying out feasibility studies and proposing regulatory reforms to catalyze private investment in the wind sector through the establishment of IPPs for generating renewable electricity. The proposed GEF project leverages the TA work achieved by the GEF wind project and it will extend its impact by directly supporting the wind farm investment at Gabes in a NAMA framework. The GEF-funded project proposed here will not overlap in implementation timeline with the current one that will terminate by July 2014.

1.4. Stakeholder Analysis

The design and conceptualisation of the project have been carried out using multi-stakeholder processes. This was a key consideration in project development for two principal reasons: (1) the 'meta-technology' characteristics of the power sector imply a diverse set of stakeholders from the public sector, the private sector and civil society are directly involved across the value chain spanning electricity generation to end-use; and (2) to ensure national institutional ownership that will aid the successful implementation of the project. The stakeholders listed in **Table 3** were actively engaged in preparation of the UNDP-implemented, GEF-financed TSP project. Their roles and responsibilities during project implementation are also captured in **Table 3**.

Table 3. Roles and responsibilities of stakeholders in the project.

Stakeholder	**Roles and responsibilities (project preparation & implementation)**
National Agency for Energy Conservation (ANME)	ANME has coordinated stakeholder consultations during preparation of the project. During the implementation phase, ANME will be the Executing Agency, will host the Project Management Unit (PMU) and will chair the Project Steering Committee (PSC). Building on previous work undertaken in conjunction with GIZ (NAMA Cement) and BMU (NAMA Buildings), ANME will support NAMA design and implementation. The UNDP-implemented, GEF-financed project will coordinate very closely with GIZ-funded projects, namely (1) capacity development for GHG inventory and MRV in Tunisia, and (2) the setting up a project team for the Tunisian Solar Plan. Both projects are implemented by ANME. Another project that will be implemented by ANME and that will be closely coordinated with the UNDP-implemented, GEF-financed project is the Partnership for Market Readiness (PMR). In particular, the development of an MRV mechanism for the energy sector will be of relevance.
Directorate General for Energy (DGE)	DGE is a department housed within the Ministry of Industry, tasked will developing the overall energy policy of the Government. Renewable energy policy, including the TSP, is an integral part of the overall energy policy. There is a long history of collaboration between ANME and DGE, especially regarding the technical aspects of energy policy and strategy development. The project team will work very closely with DGE for advocating policy and financial de-risking instruments that will be developed by the UNDP-implemented, GEF-financed project. DGE was involved in the project design stage, particularly with regard to the

	forthcoming RE Law.
Société Tunisienne de l'Électricité et du Gaz (STEG)	STEG has a quasi-monopoly in Tunisia on the generation, transmission and distribution of electricity. It is also owner of the 10 MW Tozeur PV project identified in the baseline. The UNDP-implemented, GEF-financed project has been developed in close consultation with STEG. During project implementation, STEG will be responsible for implementing the 10 MW PV project at Tozeur, including participation in the design and implementation of the performance-based mechanism to promote RES based on a territorial approach (Annex 7.6), and with the view to delivering multiple sustainable development dividends. STEG will also be closely involved in baseline development for grid-connected RE projects forming part of the TSP NAMA, and in the design and implementation of the grid code. STEG is expected to play a key role in the design and operationalisation of an Independent Energy Regulator in Tunisia.
NGOs	Few NGOs are active in the field of renewable energy in Tunisia. The principal NGO active in this field is the Association Tunisienne pour la Maîtrise de l'Energie (ATME), which was consulted during project development. During project implementation, and as an NGO representative, ATME will have an active role in the PSC. The Tunisian Wind Energy Association was also consulted during the project design phase. More specifically, the barriers and investment risks faced by proponents of wind energy were discussed with its members, as well as a discussion of the preliminary results of the Derisking Renewable Energy Investment (DREI) analysis that is presented in this Project Document and the accompanying DREI report for Tunisia.
Private sector – UTICA (Union Tunisienne de l'Industrie du Commerce et de l'Artisanat), and EnerCiel & Cimenterie de Gabes	Because of the prevailing barriers, there is currently limited private sector involvement in renewable energies in Tunisia. The most prominent private developer to date, UPC Wind/EnerCiel, has been heavily involved in preparation of the UNDP-implemented, GEF-financed project. Since UPC Wind/EnerCiel is also the owner of the Gabes wind farm baseline project, it will continue to be a key stakeholder throughout project implementation. Further, UPC Wind/EnerCiel will be a member of the Project Steering Committee. Cimenterie de Gabes will also be closely involved in project implementation since it is beneficiary of the wind farm at Gabes. The DREI methodology, which has been used in the preparation of the project, and will be used in Component 1 to assist the NAMA preparation, involves active outreach to the private sector to solicit its quantitative feedback on the barriers and investment risks to renewable energy in Tunisia. The DREI analysis performed for this Project Document involved structured interviews with 12 private sector investors, both domestic and international. In order to develop better linkages with the private sector, the project will also involve UTICA very closely in project implementation and M&E. UTICA is an umbrella organisation that represents large-scale and SME enterprises. It has a working group devoted to energy in industry and commerce.
Ministry of Economics and Finance (MEF)	The Ministry of Economics and Finance will be involved in the establishment of climate financing mechanisms during project implementation. The Ministry is expected to be a key member of the high-level Inter-Ministerial Committee that will be established by the UNDP-implemented, GEF-financed project. It will also play a critical role in the design and administration of financial instruments to support implementation of renewable energy technologies and the means of capitalising the restructured Energy Transition Fund that is proposed in

	Component 2 of this project. The Ministry will also be involved in the design and implementation of the performance-based mechanism based on a territorial approach (Annex 7.6) to promote RES.
Ministry of Equipment, Land Planning and Sustainable Development (MELPSD)	The GEF Operational Focal Point and the DNA are hosted within the Ministry of Environment. The former was involved during the PIF and project preparation phases and will continue his involvement during project implementation. In the PPG phase, the members of the DNA Committee were consulted, especially regarding Outputs 2.1 and 2.2. The project will support the institutional structures of the Ministry to act as the national coordinating institution and provide quality assurance for NAMAs through dedicated training. In this capacity, the MELPSD is expected to be a key member of the Inter-Ministerial Committee that will be established by the UNDP-implemented, GEF-financed project to provide high-level political support for implementation of the TSP. A set of NAMA eligibility criteria will be developed by the project and will be used by MELPSD to screen NAMAs proposed in Tunisia (for example, see Annex 7.1).
GIZ/BMU	GIZ has been consulted throughout all the stages of project design and conceptualisation, specifically – but not exclusively – in regard to the projects discussed in Section 1.3.2. Since GIZ is working in close collaboration with ANME, seamless coordination with projects implemented by GIZ will be ensured. Further, lessons-learned from the GIZ projects will be drawn upon when implementing the UNDP-implemented, GEF-financed project.

1.5. Analysis of Barriers

As discussed in the previous sections, achievement of the investment targets under the TSP has been slow because of the presence of significant barriers. In general, when framing a project or NAMA, the existing barriers should be identified and analysed, and solutions proposed. In the present case, the solutions will be outputs of the UNDP-implemented, GEF-financed project. Based on the barrier analysis methodology used for conducting Technology Needs Assessments (TNAs) to develop NAMA technology action plans, generic barriers may include:[55]

- Economic and financial: the higher initial cost of RES, potential impacts on local manufacturers or distributors;
- Information: lack of knowledge of the technology and its benefits, concerns about environmental and social impacts of technologies, concerns about power supply variables (surges, brown-outs, black-outs) and the performance of variable renewables, and the lack of MRV systems to track the impact of technologies;
- Regulatory and institutional: lack of performance standards, lack of procurement policies, inadequacy/lack of verification and enforcement capacity;
- Market: technology not yet available in the market, low volume demand for products, lack of incentives to adopt new technologies;
- Behavioural: unfamiliarity with, or unwillingness to buy or use, new technologies.

The barrier analysis provides the basis for defining the interventions, the activities that form the core of the project, and which should solve the problems posed by the barriers. In the design of this project, Logical Problem Analysis[56] (LPA) and De-Risking Renewable Energy Investment[57]

[55] UNDP (2010), *Handbook for Conducting Technology Needs Assessments for Climate Change*, UNDP: New York; Boldt, J., Nygaard I., Hansen U. E. and Trærup S. (2012), *Overcoming Barriers to the Transfer and Diffusion of Climate Technologies*. UNEP Risø Centre, Roskilde, Denmark, 2012. Chapter 8 and Annex A.
[56] Boldt, J., Nygaard I., Hansen U. E. and Trærup S. (2012), *Overcoming Barriers to the Transfer and Diffusion of Climate Technologies*. UNEP Risø Centre, Roskilde, Denmark, 2012, pp. 21-24.
[57] Waissbein, O., Glemarec, Y., Bayraktar, H. and Schmidt, T. S. (2013), *De-Risking Renewable Energy Investment: A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries*, UNDP: New York.

(DREI) analysis have been used. The two approaches are complementary and they provide a combination of qualitative (LPA) and quantitative (DREI) assessment of barriers.

The central problem statement that has been used to apply LPA and DREI analysis (Section 1.6) is that '*Low levels of private investment in utility-scale renewable energy impede the implementation of the TSP*'. The focus on private-sector investments is due to the fact that the very high levels of investment required to implement the TSP are beyond the means of public funding, and national documents clearly mention that investments will be sourced largely from the private sector.[58] Also, the problem statement captures the fact that global environmental benefits and other sustainable development benefits (Section 2.4) can only accrue following investments in renewable energy.

LPA has been applied to identify the root causes of the problem statement by analysing causal relations. The review of national documents and in-depth engagements with key stakeholders during project preparation has revealed the presence of eight broad categories of barriers: economic; resources & technology; legal & regulatory; technical; institutional; policy; financial; and macro-economic. These barriers are ordered in a hierarchy of cause-effect relations (strings), with the starter problem (or problem statement) in the centre, the direct causes below it and the direct effects above. Each new problem is linked to causes and effects respectively, so that multi-level cause-effect paths are created to form the problem trees (PTs) shown in Annex 7.2. The root causes are at the lowest decomposition levels of the PTs, and it is at the lowest level that interventions can be made to reverse the string of causes and effects in order to overcome the main barriers. From a systemic perspective, the central problem statement is most effectively reversed by overcoming all the barriers.

The LPA tool is, therefore, useful for the identification of measures. This is done by reformulating all the problems as positive statements about a future situation in which the problems are solved. The result of 'negating' or 'mirroring' the PT is the Objective Tree (OT), wherein the cause-effect relations of the PT are converted into measure-result relations. The OT for overcoming economic, resource & technology, and legal & regulatory barriers is shown in Annex 7.2. In this case, the four measures that have been identified to form part of the UNDP-implemented, GEF-financed project are marked (red ticks). These measures were chosen based on the extensive stakeholder consultations that were carried out during the design and development of the Project Document, recommendations of feasibility studies[59], and supported by the DREI analysis that is discussed next (Section 1.6 and Annex 6.3).

1.6 De-risking Renewable Energy Investment (DREI) Analysis

To deepen the LPA, the DREI methodology, developed by UNDP,[60] has been applied in the design of this project. The theory of change underlying the DREI methodology is that one of the principal challenges for scaling-up RES in developing countries is to lower the financing costs that affect renewables' competitiveness against baseline technologies – i.e. primarily fossil fuels. As these higher financing costs reflect barriers and associated risks in the investment environment, the key entry point for policy-makers to promote RES is to address these risks and thereby lower the overall life-cycle costs of RES. Taking this approach, the DREI methodology allows policymakers to quantitatively compare different packages of measures to promote renewable energy and to compare their cost-effectiveness.

The DREI methodology acknowledges that barriers act as drivers of investor risk, and the existence of a barrier (e.g. lack of clear responsibility of different agencies for renewable energy

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[58] Laponche, B., and Missaoui, R. (2012), *Elaboration d'une Nouvelle Version du Plan Solaire Tunisien : Tome II - Programmation, Conditions et Moyens de la Mise en Œuvre*. ANME: Tunis. pg. 21; ANME (2014), *Organising Framework for Scoping of PMR Activities* – presentation made on 14 February 2014, Mexico.

[59] See for example, ANME (2014), *Analyse des Possibilités NAMA dans le Secteur d'Electricité Renouvelable*.

[60] Waissbein, O., Glemarec, Y., Bayraktar, H. and Schmidt, T. S. (2013), *De-Risking Renewable Energy Investment: A Framework to Support Policymakers in Selecting Public Instruments to Promote Renewable Energy Investment in Developing Countries*, UNDP: New York.

approvals) increases the probability of negative events (e.g. delays due to poorly-administered licensing) affecting the renewable energy project. In turn, the negative events result in financial impacts for investors (e.g. transaction costs; delayed revenues; under- or no investment). The sequence of events and impacts due to risks arising from barriers is shown in **Figure 11**.

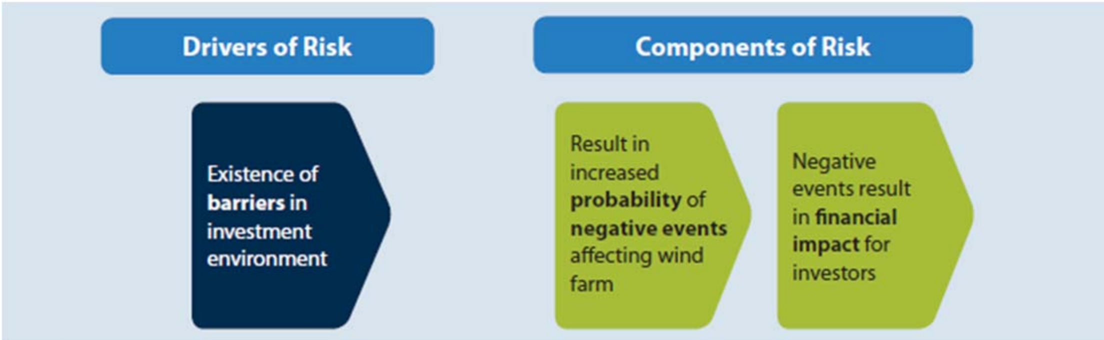


Figure 11. Drivers and components of investor risk for renewable energy investment. (Source: Waissbein *et al*. (2013), pg. 47)

Extensive DREI analysis was carried out during the project design. For completeness, the main results are discussed in this section and supplementary information is given in Annex 7.3. Since the full DREI analysis is beyond the scope of the Project Document, it is being published as a stand-alone report.[61]

The value added by DREI analysis is:

- To provide the evidence that public de-risking instruments are cost effective to catalyse private investments in renewables;
- To complement the LPA discussed in section 1.5 with a more quantitative analysis. This is crucial since not all of the identified barriers contribute equally to prevent investments in renewable energy. Consequently, the effectiveness of identified measures in overcoming barriers to investment in RES varies between measures; and
- To provide an analytical framework that will be further developed during project implementation to design technology- and geographically-specific packages of public de-risking instruments (and to identify the need for any incentives to overcome residual risks) to implement the TSP NAMA.

The DREI methodology is organised around four stages. These stages are:[62]

Stage 1: Risk Environment identifies the set of investment barriers and associated risks relevant to the renewable energy technology, and analyses how the existence of investment risks can increase financing costs.

Stage 2: Public Instruments (or measures) selects a mix of public de-risking instruments to address the investor risks and quantifies how they, in turn, can reduce financing costs. This stage also determines the cost of the selected public de-risking instruments.

Stage 3: Levelised Cost determines the degree to which the reduced financing costs impact the renewable energy's life-cycle cost (levelised cost of electricity, LCOE). This is then compared against the current baseline generation costs in the country.

[61] Waissbein, O., Deenapanray, P. N. K. and Kelly R. (2014). *Tunisia: De-Risking Renewable Energy Investment*. New York, NY: United Nations Development Programme.
[62] Waissbein *et al*. (2013), pg. 17.

Stage 4: Evaluation assesses the selected public de-risking instrument mix using four performance metrics, as well as through the use of sensitivity analyses. The four metrics are: (i) investment leverage ratio, (ii) savings leverage ratio, (iii) end-user affordability, and (iv) carbon abatement.

In the context of preparing the UNDP-implemented, GEF-financed project, the DREI analysis has been carried out for wind energy and PV, which are the two technologies that are considered in the TSP within the 2020 time horizon (i.e. within the lifetime of the UNDP-implemented, GEF-financed project). Annex 7.3 provides the results of the application of the framework's four stages, including all of the assumptions that have been used in the analysis. The open-source financial tool used to carry out the analyses in Stages 3 and 4 is available at the UNDP website.[63] Stages 1 and 2 build on the results of the LPA shown in Annex 7.2. The measures identified in Stage 2 can be classified as policy de-risking instruments (i.e. instruments that overcome policy barriers) or financial de-risking instruments (i.e. instruments to transfer risks from the private to the public sector) as follows:[64]

- **Policy de-risking instruments** address and attempt to remove the underlying barriers that are the root causes of risks. As the name implies, these instruments utilise policy and programmatic interventions to mitigate risk. For example, renewable energy projects typically involve obtaining a number of permits and approvals, including generation licences, environmental impact assessments (EIAs) and land rights. Unclear and overlapping institutional responsibilities related to renewable energy permitting, or lack of staff experience with renewable energy, can increase transaction costs, delay revenues and discourage investment. A policy de-risking approach might involve streamlining the permitting process, clarifying and standardising institutional responsibilities, reducing the number of process steps, and providing capacity building to programme administrators.

- **Financial de-risking instruments** do not seek to directly address the underlying barrier but, instead, function by transferring the risks that investors face to public actors, such as development banks. These instruments can include development bank loans and guarantees, political risk insurance and public equity co-investments. In addition to transferring risks, financial de-risking instruments can also indirectly address certain underlying barriers through learning-by-doing and track-record effects. For example, in countries with immature and under-capitalised financial sectors, local banks may be concerned about lending their limited capital to borrowers in an unproven sector such as renewable energy. Partial loan guarantees from a development bank can provide these local banks with the security they need to issue loans, whereby a portion of the risk of default is transferred to a public actor. In this way, financial de-risking instruments can kick-start the local financial sector's involvement in renewable energy.

The specific policy and financial de-risking instruments that have been analysed in the context of the TSP NAMA are summarised in Table 7.3.2 and Table 7.3.3, respectively, in Annex 7.3. Policy de-risking instruments that are supported by the UNDP-implemented, GEF-financed project are measures such as: establishing a transparent grid code that provides the technical specifications for the interconnection of RES to the national grid; the operationalisation of an Independent Energy Regulator that will provide market confidence and long-term visibility to potential investors; and the establishment of PPP legislation to promote private investments specifically in the power sector. Application of these de-risking instruments will help to shift the risk-reward profile of RES, as demonstrated schematically in **Figure 12**. The figure illustrates a

[63] www.undp.org/DREI - accessed 5 June 2014.

[64] Recognising that all risks cannot be eliminated through policy de-risking or transferred through financial de-risking, efforts to reduce risks might need to be complemented by a third group of public instruments, **direct financial incentives**, to compensate for any residual risks and costs. These incentives can take a number of different forms including price premiums, tax breaks, such as production tax credits, and proceeds from carbon offsets.

shift from a commercially unattractive investment opportunity (right) to a commercially attractive one (top). This is achieved through two actions: first, by reducing the risk of the activity (de-risking); and, second, by increasing the return on investment through financial incentives.

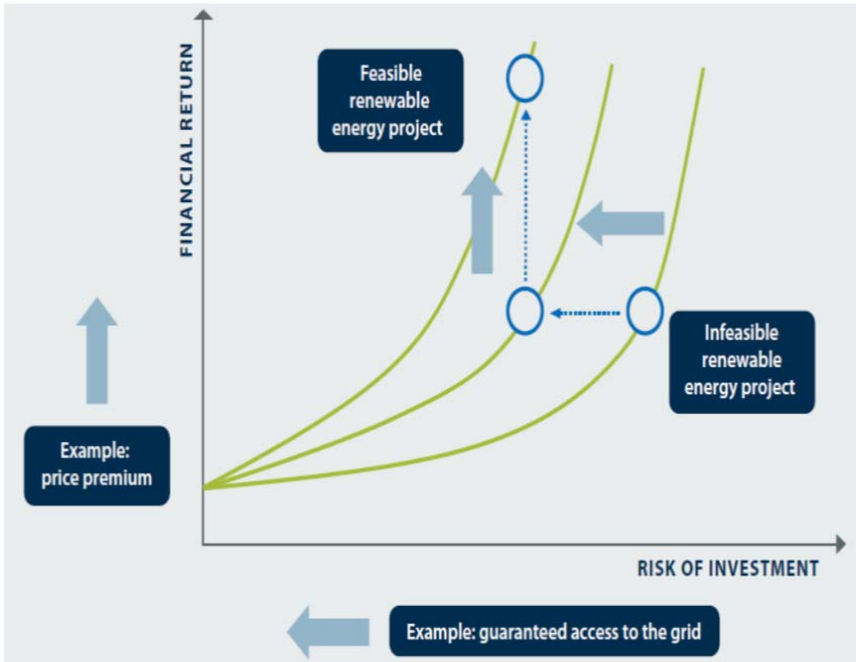


Figure 12. Shift in the risk-reward profile of RES through de-risking (Source: Waissbein *et al*., 2013).

The principal results of the DREI analysis are shown in Figures 13 to 16. Risks that are caused by barriers increase the cost of both equity and debt (**Figure 13**) in Tunisia compared to the cost of capital in the best-in-class country (Germany). The risk categories and underlying barriers that form the starting framework for analysis in Tunisia are described in **Table 4**. The effects of risk on the cost of capital are treated jointly for wind energy and PV, as explained in Annex 7.3. Germany has been chosen as a benchmark country because it offers an appropriate private-sector investment environment wherein the cost of capital is among the lowest in the world. The low cost of capital corresponds to a low investment risk environment.

Based on interviews with investors, the cost of equity in Tunisia is estimated at 15%, and the cost of debt at 6.5%. The risk categories that contribute most to the increase in the cost of capital in Tunisia relative to Germany are: power market risk; grid integration risk; currency/macro-economic risk; counterparty risk; political risk; and financing risk. Because of prevailing barriers and risks, the costs of equity and debt are higher by 7% and 2.5%, respectively, in Tunisia compared to the benchmark. The higher risks and the correspondingly higher costs of capital would require higher returns to justify investments, making investments in RES less attractive. The real impacts of risks on the LCOE of renewable electricity are further discussed below (for wind) and in Annex 7.3 (for PV).

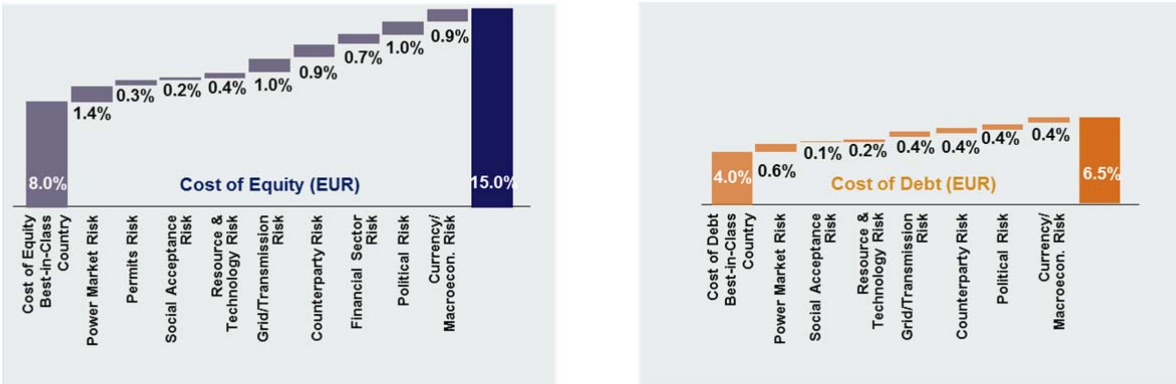


Figure 13. Risk-induced increase in the cost of capital in Tunisia: equity (left) & debt (right).

The generic risk categories (**Table 4**) were applied in the DREI analysis in Tunisia to reflect the prevailing local context. Table 7.3.1 in Annex 7.3 shows the detailed barriers and risks table for wind energy in Tunisia. A similar table has been developed for PV and can be found in the accompanying Tunisia DREI report.[65]

Table 4. Description of the generic risk categories that were considered for the DREI analysis in Tunisia.

Risk Category	Generic Description	Underlying Barriers
Power Market Risk	Risk arising from limitations and uncertainties in the power market, and/or sub-optimal regulations to address these limitations and promote renewable energy markets	• *Market outlook*: Lack of or uncertainties regarding Government renewable energy strategy and targets • *Market access/price*: Sub-optimal energy market liberalisation; uncertainties regarding competitive and price outlook; limitations in PPA and/or PPA process • *Market distortions*: high fossil fuel subsidies
Permits Risk	Risk arising from the public sector's inability to efficiently and transparently administer renewable energy-related licensing and permits	• Labour-intensive, complex processes and long time-frames for obtaining licences and permits (generation, EIAs, land title) for renewable energy projects • High levels of corruption. No clear recourse mechanisms
Social Acceptance Risk	Risks arising from lack of awareness and resistance to wind energy in communities, end-users, and other stakeholders such as unions	• Lack of awareness of renewable energy amongst consumers, end-users, and local residents
Resource & Technology Risk	Risks arising from use of the renewable energy resource and technology (resource assessment; construction and operational use; hardware purchase and manufacturing)	• *For resource assessment and supply:* inaccuracies in early-stage assessment of renewable energy resource • *For planning, construction, operations and maintenance:* uncertainties related to securing land; sub-optimal plant design; lack of local firms and skills. limitations in civil infrastructure (roads etc.) • *For the purchase and, if applicable, local manufacture of hardware:* purchasers' lack of information on quality, reliability and cost of hardware; lack of local industrial presence and experience with hardware
Grid/Transmission Risk	Risks arising from limitations in grid management and transmission infrastructure in the particular country	• *Grid code and management*: limited experience or sub-optimal operational track-record of grid operator with variable sources (e.g. grid management and stability). Lack of standards for the integration of variable renewable energy sources into the grid • *Transmission infrastructure:* inadequate or antiquated grid infrastructure, including lack of transmission lines from the renewable energy source to load centres; uncertainties for construction of new transmission

[65] Waissbein, Deenapanray and Kelly (2014).

Risk Category	Generic Description	Underlying Barriers
		infrastructure
Counterparty Risk	Risks arising from the utility's poor credit quality and an IPP's reliance on payments	• Limitations in the utility's (electricity purchaser) credit quality, corporate governance, management and operational track-record or outlook; unfavourable policies regarding utility's cost-recovery arrangements
Financial Sector Risk	Risks arising from the lack of information and track record on financial aspects of wind energy, and general scarcity of investor capital (debt and equity), in the particular country	• C*apital scarcity*: Limited availability of local or international capital (equity/and or debt) for green infrastructure due to, for example: under-developed local financial sector; policy bias against investors in green energy • *Limited experience with renewable energy:* Lack of information, assessment skills and track-record for renewable energy projects amongst investor community; lack of network effects (investors, investment opportunities) found in established markets; lack of familiarity with project finance structures
Political Risk	Risks arising from country-specific governance, social and legal characteristics	• Uncertainty or impediments due to war, terrorism, and/or civil disturbance • Uncertainty due to high political instability; poor governance; poor rule of law and institutions • Uncertainty or impediments due to government policy (currency restrictions, corporate taxes)
Currency/Macro-economic Risk	Risks arising from the broader macroeconomic environment and market dynamics	• Uncertainty due to volatile local currency; unfavourable currency exchange rate movements • Uncertainty around inflation, interest rate outlook due to an unstable macroeconomic environment

Note: The starting risk categorisation framework is given in Waissbein *et al.* (2013), Table 4, pp. 59-60.

The specific public instruments that were modelled to de-risk investments in wind energy and PV in Tunisia are shown in **Table 5**.

Table 5. Public instrument selection to promote wind energy and solar PV in Tunisia.

Risk Category	Policy De-risking Instruments	Financial De-risking Instruments
Power Market Risk	• Long term targets • Regulatory framework • FIT/PPA tender (standardised PPA) • Independent regulator	NA
Permits Risk	• Streamlined permitting; one-stop shop; recourse mechanism	NA
Social Acceptance Risk	• Awareness raising campaigns • Promote/pilot community-based approaches	NA
Resource & Technology Risk	• Resource assessment • Technology support (solar PV)	NA
Grid/Transmission Risk	• Transparent, up-to-date grid code • Grid management/planning	• Take or pay clause in PPA
Counterparty Risk	• Strengthen utility's management	• Government guarantee of PPA
Financial Sector Risk	• Domestic financial sector reform	• Concessional public loans to IPPs
Political Risk	NA	NA
Currency/Macroeconomic Risk	NA	• Partial indexing of PPA tariffs to foreign currencies

Note: NA indicates Not Applicable.

Figure 14 shows that the cost of capital in Tunisia for wind energy and PV can be reduced through a combination of selected policy and financial de-risking instruments. The public policy and financial de-risking instruments that have been identified and rated by stakeholders as being most effective and appropriate for the Tunisian context are summarised in Tables 7.3.2 and Table 7.3.3, respectively. These public de-risking instruments are able to reduce the cost of equity by 2.3% (i.e. ~33% of the gap when compared to the benchmark) and that of debt by 0.9% (i.e. ~36% of the gap when compared to the benchmark). Based on the outcome of interviews (Annex 7.3), the de-risking instruments are particularly effective at reducing four key risk categories, namely: power market risk, grid integration risk, counterparty risk, and currency/macro-economic risk.

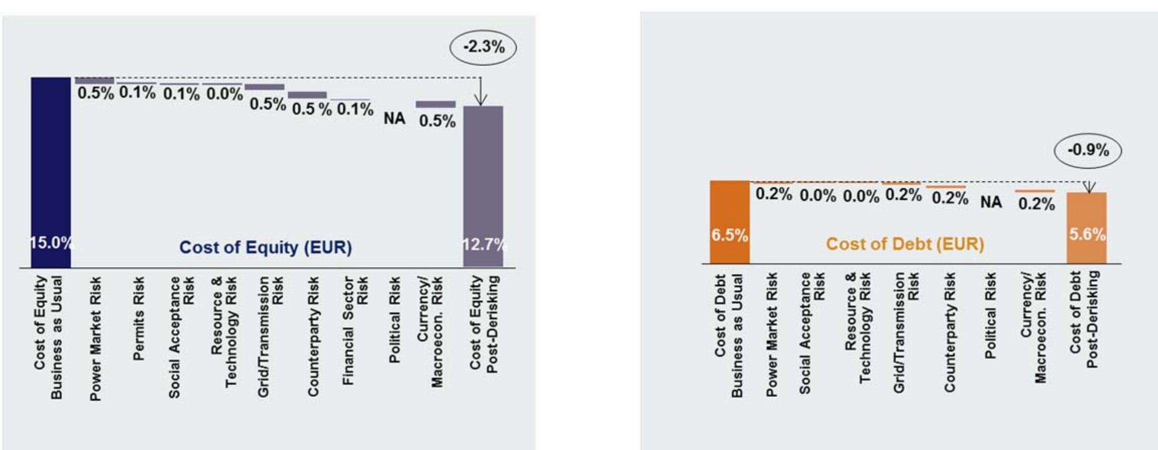


Figure 14. Reducing the cost of capital (equity - left; debt - right) using de-risking instruments.

The application of de-risking instruments to reduce the cost of capital has the benefit of reducing the LCOE, as shown in **Figure 15** for wind energy. The results for PV are shown in Annex 7.3.

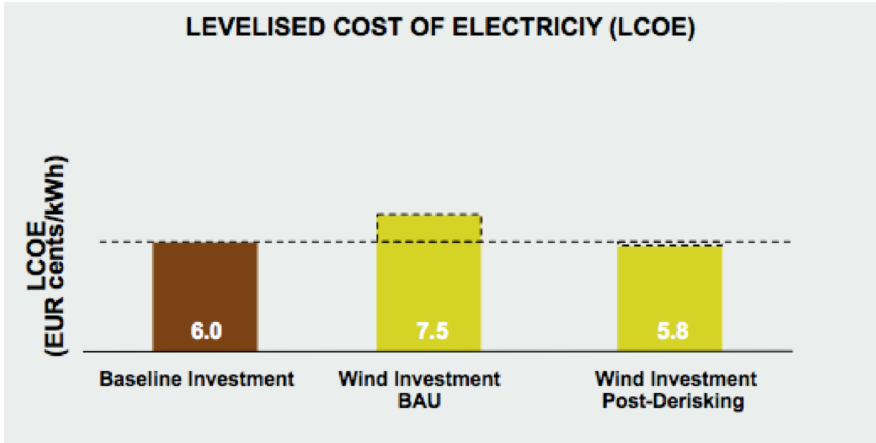


Figure 15. LCOE of wind energy before and after de-risking

The LCOE of electricity generated from wind is €7.5 cents/kWh in the business-as-usual (i.e. prevailing barriers and risks) scenario,[66] whereas it is €6.0 cents/kWh for electricity generated by gas (using a combined cycle gas turbine, CCGT). Applying the public de-risking instruments reduces the LCOE of electricity generated from wind to €5.8 cents/kWh (**Figure 15**). In the BAU scenario (i.e. in the absence of de-risking instruments), €1.7 cents/kWh must be provided in compensation to an independent power producer (IPP), either in the form of a feed-in tariff (FiT) or a preferential tariff in a Power Purchase Agreement (PPA), so as to make wind-generated electricity cost-competitive relative to gas-generated electricity.

The performance metrics for the public instruments in promoting wind energy investment in Tunisia are shown in **Figure 16**. For the installed wind capacity of 1,404 MW that is proposed in the TSP by 2030 (capital investment = €1.855 billion), the total cost of such compensation is estimated as €644 million. With de-risking instruments in place, however, this compensation can be eliminated completely. The costs of putting in place the required policy and financial de-risking instruments are €8 million and €279 million, respectively – i.e. a total of €287 million (**Figure 16(a)**). Therefore, through the use of de-risking instruments, the total cost for achieving the same penetration of wind energy would be only €287 million. This gives a leverage ratio of 6.5 for de-risking instruments: i.e. for every €1 of public money spent on compensatory payments (a FiT or preferential PPA tariff) and de-risking instruments, €6.5 of private-sector investment can be mobilised for wind energy. This compares very favourably with the scenario in which compensatory payments are offered but unaccompanied by de-risking measures: in this scenario, the leverage ratio is just 2.6. **Figure 16(b)** shows that, since the post-de-risking LCOE for wind energy is lower than the baseline case by €0.2 cents/kWh, the public instruments, though costing €287 million, actually result in savings in the baseline of €70 million. Since the premium that should be paid to wind energy in the BAU scenario is no longer needed to make it competitive, the net saving is €712 million. This corresponds to a savings ratio of 2.5. Alternatively, end-users experience a net reduction in the cost of electricity of 22.5% - i.e. a reduction from €7.5 cents/kWh to €5.8 cents/kWh due to the implementation of the selected package of public instruments as shown in **Figure 16(c)**.

[66] A capacity factor of 30% has been used to be in alignment with the TSP and Energy Mix studies. See Table 7.3.6 in Annex 7.3 for more details.

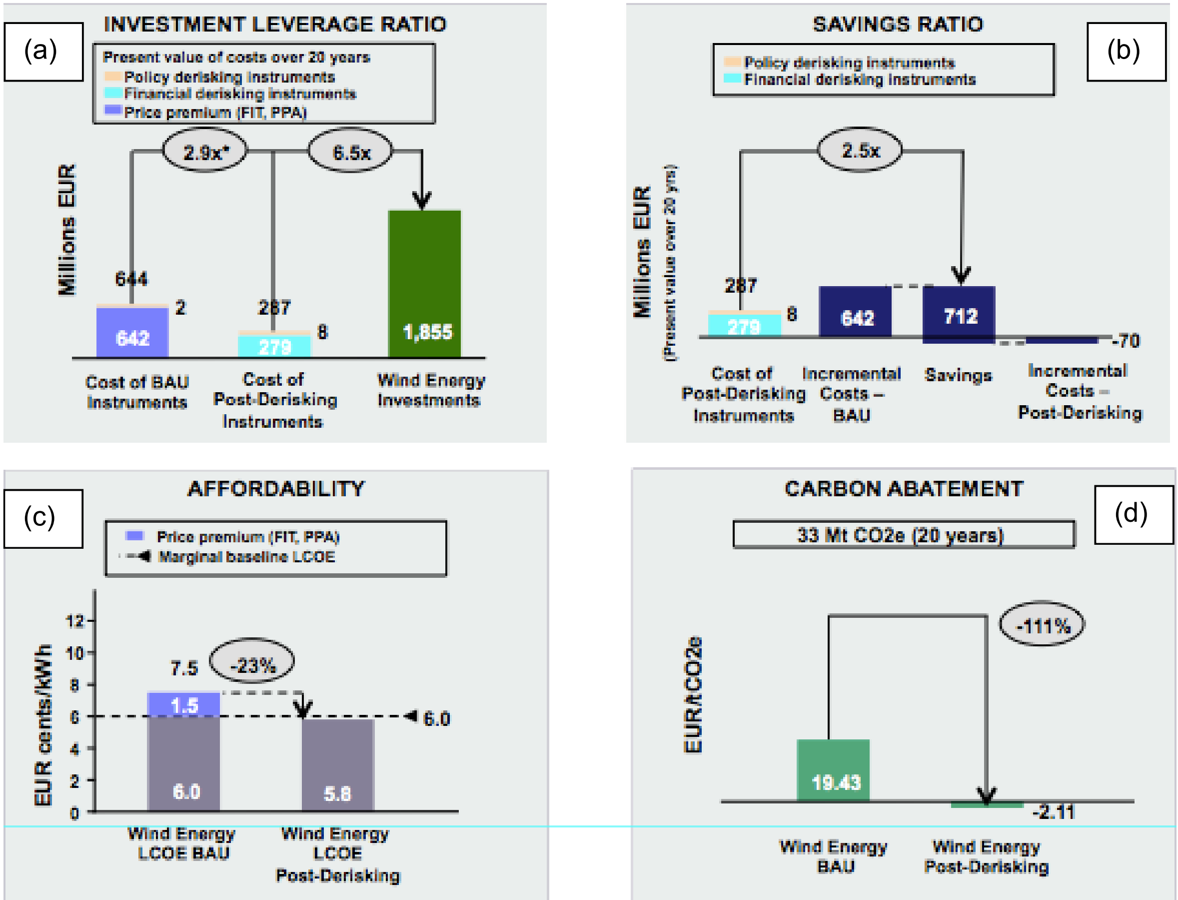


Figure 16. Performance metrics for selected package of public instruments in promoting wind energy investment in Tunisia: (a) investment leverage ratio; (b) savings ratio; (c) affordability; and (d) carbon abatement.
*In the BAU scenario, the full 2030 investment target may not be met.

Figure 16(d) shows that the GHG abatement cost is -2.11 €/tCO_{2e} with de-risking instruments applied, whereas it is a significant 19.43 €/tCO_{2e} when full compensation is required to promote wind energy.

In short, the selected public de-risking instruments are a highly cost-effective means of reducing investment risks, thereby reducing the cost of capital (the interest rate on debt and the expected rate of return on equity), thereby reducing investment costs, and thereby reducing the LCOE differential between wind (and PV) electricity and baseline (gas) electricity.

1.7. Addressing Barriers and Risks

Table 6 outlines the barriers and root causes, and shows how these will be addressed by the UNDP-implemented, GEF-financed project through linking of the barriers with the Outputs described in the Results Framework (Section 3). Since there are interconnections between barriers, an Output shown in the Results Framework may address different barriers simultaneously. An important point to note is that while the DREI analysis has been used in the design stage to substantiate the measures proposed in the UNDP-implemented, GEF-financed project (as Outputs), it is also included as a tool to be used in the further development of the TSP NAMA, including the technology-specific action plans that will serve to implement the NAMA.

Table 6. Analysis of barriers and how the project proposes to address them.

Barriers	Options
	Current situation
	Proposed project-supported activities (the Output numbers correspond with the table in Section 3 (Project Results Framework)
Legal and regulatory barriers	
Current conditions do not provide the visibility for investors to invest in renewable energies on the scale required to achieve the ambitious goals of the TSP.	There is a near-monopoly in Tunisia concerning the generation, transmission and distribution of electricity. The TSP will require substantial investment of the order of €5-6 billion, of which most is expected to come from the private sector. To date, there are significant barriers associated with catalysing private investment in Tunisia. Decree 2009-2773 allows for the decentralised generation of renewable electricity but only primarily for self-consumption. Producers are allowed to sell a maximum of 30% of their production to the grid at cost parity (i.e. with no feed-in-tariff, FiT). Investment in renewables is made even more difficult as the cost of electricity is subsidised. Reforms of the subsidy on electricity have commenced and will be further expanded over the next 4-5 years, and the forthcoming RE Law is expected to introduce a FiT regime for RES.
	Outputs 1.3 and 2.4 • The project will revise existing regulatory structures and will establish secondary laws for promoting private investment (notably through a Public-Private Partnership, PPP, Act). PPPs can be a vital modality for attracting private investment since the public partner (STEG) can absorb certain risks, such as access to the grid, constructing sub-stations for interconnections, establishing transmission lines, etc. • A grid code will be developed that renewable energy technologies must meet. This will provide transparency in the technical standards requirements for renewable electricity interconnection to the national grid while ensuring grid stability. • In the eventuality that the grid drops out, the current Grid Connection Agreement envisages that STEG has up to 3 days to remedy the situation. This poses a serious opportunity cost for the producer. The contracts will be reviewed so that the delay can be reduced to 24 hours. • Investigating the cost-effectiveness of policy instruments provides an evidence-based and transparent approach to informing decisions about regulatory reforms. Complementary tools such as system dynamics modelling (SDM) and DREI will be deployed in the design of the energy sector NAMA. System dynamics modelling will allow the cross-sectoral impacts of RE investments to be quantified, as well as the resulting sustainable development dividends. The DREI analysis shown in Annex 7.3 will be further detailed by updating all the assumptions used, and will be extended to CSP.
Institutional and policy barriers	

<table>
<tr>
<td rowspan="2">In the absence of a coherent and integrated renewable energy policy and supporting policy instruments, there is no transparent and uniformly applicable system in place to allow Tunisia to embark on a low-emission development pathway. At best, renewable energy initiatives will remain ad hoc and piecemeal. Further, since the TSP seeks to engage a multitude of stakeholders, it will require high-level political support and effective coordination. The mechanisms for achieving this are not present at the moment.</td>
<td>The revised TSP (2012) has identified institutional barriers that currently hinder its effective implementation. Overcoming these institutional barriers is in line with the Government's economic priority of increasing the private sector's contribution to economic growth in Tunisia. But, in the baseline, an ad hoc committee is envisaged to engage institutions on a project or needs basis, and there is no permanent institutional structure in place to advocate for the implementation of the TSP. Further, there is a need for cross-sectoral coordination in order to share lessons-learned on NAMA and MRV system development from different sectors, and also to address any issues relating to GHG double-counting (since several NAMAs have components linked to the power sector).

Climate change mitigation is not well integrated in national policy and planning systems. First, Tunisia does not have any means today to investigate the cross-sectoral impacts of the TSP. This is important since, in addition to reducing GHG emissions, the TSP is also intended to contribute to economic growth, job creation and technology transfer that will have positive spill-over effects in terms of innovation. Second, there are a multitude of policy instruments that can be used to support the diffusion of renewable energies and understanding their relative cost-effectiveness is important. Also, there is a need to link financial and/or economic instruments to the budgetary process. Currently, Tunisia has no means to carry out such analysis.

Some limited work has been undertaken to date by the UNDP-implemented, GEF-financed 'Private sector-led development of on-grid wind power in Tunisia' project[67] on sustainable development indicators associated with renewable energy. Currently, however, there are no nationally-approved criteria and indicators for quantifying and qualifying the sustainable development dividends of NAMAs in Tunisia. Also, there is no recognized institution that bears the responsibility for providing quality assurance for NAMAs.</td>
</tr>
<tr>
<td>Outputs 1.1 to 1.3, 2.1, 2.2
• A permanent Inter-Ministerial Committee with high-level representation will be established to provide political support for the TSP.
• A Secretariat will be established and capacitated within ANME to coordinate the activities of all relevant stakeholders and provide timely and accurate information about implementation of the TSP.
• The project will deploy a dynamic modelling methodology that will allow Tunisia to carry out integrated, cross-sectoral energy policy and strategy planning. Importantly, scenario analysis using the tool will allow the costs of the TSP (and the cost-effectiveness of policy instruments for supporting the implementation of the TSP) to be fully integrated into policy planning. DREI analysis will be carried out as a complement.
• The DNA will be re-organised and capacitated to provide quality assurance for NAMAs in Tunisia. A coordination mechanism will be established to promote liaison between the DNA and NAMA developers such that NAMAs are developed according to consistent methodologies and the MRV systems established by individual NAMAs are robust and meet minimum standards.
• One set of sustainable development guidelines (criteria and indicators) will be established for all NAMAs in Tunisia.</td>
</tr>
<tr>
<td colspan="2">Information and awareness Barriers (relates to other barriers)</td>
</tr>
</table>

[67] PMIS 967.

Lack of knowledge and negative perception of renewable energy technologies supported in the TSP still exist among decision-makers, the banking sector, the energy sector community and the general public.	The low penetration of renewable electricity generation in Tunisia, coupled with the fact that STEG maintains a quasi-monopoly on electricity generation, transmission and distribution, means that investors, including local actors, are risk-averse with regard to financing renewable energy technologies. This situation is further reinforced by the other barriers discussed here. The TSP envisages the sale of electricity (up to 20% of renewable generation capacity) to European countries across the Mediterranean Sea. Although this proposal has existed for a number of years, there has been surprisingly little analysis in Tunisia of how best to accomplish this. The proposed project will provide assistance to support this analysis.
	Outputs 1.1, 1.2, 2.1, 2.2, 2.5, 2.8. • A high-level Inter-Ministerial Committee will be established to provide political support and advocate for the TSP. • A Secretariat will be established to provide a coordination facility for the TSP and support the removal of barriers associated with the implementation of the TSP. • Lessons-learned, experiences and best practices related to the development of energy NAMAs will be compiled and disseminated for operationalising MENA national solar plans (e.g. Morocco, Jordan, Lebanon, Egypt) and to demonstrate an architecture for leveraging climate finance. • Three technology-specific (PV, wind and CSP) action plans (TAPs) will be developed to constitute the NAMA TSP. Measures for barrier removal (policy de-risking instruments), risk transfer measures (financial de-risking instruments), institutional and capacity development requirements, MRV structures and processes, full project descriptions and detailed cost estimates will be carried out based on the tools and methodologies developed in 1.3 and 2.3. Each TAP will be undertaken for the ensemble of projects pertaining to each technology, providing the basis for developing a power sector NAMA – i.e. the TSP NAMA – as is further discussed below under Component 2 of the Alternative Scenario. The project will carry out technology-specific barrier and enabling framework analysis using methodologies and tools such as market mapping techniques and Logical Problem Analysis coupled with incremental cost-benefit analysis and DREI analysis. Importantly, each TAP will be linked to the territorial performance-based mechanism described in Annex 7.6.
Technical barriers (lack of technical capacity)	
There are technical barriers related to each type of technology proposed under the TSP. Under the UNDP-implemented, GEF-financed project, the capacity to address these barriers is facilitated by making use of other levers related to the	The project proposes the use of a learning-by-doing methodology to support capacity building, which will be targeted at institutions and selected staff of key institutions. While human capacity is needed to develop and use the tools for NAMA development, institutionalisation of the tools is required to use them in policy decision-making. Current legislation does not require an Environmental Impact Assessment (EIA) permit for power plants with an installed capacity of less than 300 MW.[68] The two baseline projects have been screened using UNDP's Environmental and Social Safeguards (see Annex 7.4),[69] and this screening has generated lessons-learned that can be used to develop a set of guidelines for utility-scale RES. This will be vital for not only ensuring the environmental and social sustainability of future renewable energy investments but will meet a key investment requirement of donors and multilateral development banks.

[68] Decree n° 1991 of 11 July 2005 – Article 2, Annex 1: Category B. pg. 1838.
[69] UNDP (2012), *Environmental and Social Screening Procedure for UNDP Projects – Guidance Note*.

development of NAMAs, and by removal of the barriers discussed here.	*Outputs 1.3, 2.1, 2.3, 2.5, 2.7, 2.8* • Capacity building for model development and scenario analysis for the promotion of renewable energy technologies and the development of investment plans. • Capacity building on how to carry out technology-specific barrier and enabling framework analysis using methodologies and tools such as market mapping techniques and Logical Problem Analysis coupled with incremental cost-benefit analysis developed under the GEF-financed TNA project; • Capacity building for establishing baseline methodologies and MRV systems for NAMAs; • Capacity building for the DNA to establish national NAMA standards (e.g. relating to the quality of MRV systems and GHG accounting methodologies) that Tunisian NAMAs must adhere to. Capacity building will also be offered to NAMA developers to assist in adherence to these standards. • Capacity building for developing a territorial performance-based mechanism to promote RES at the regional level. • Development of guidelines for carrying out EIAs for RE projects based on lessons-learned from UNDP's environmental and social safeguards and other international (e.g. World Bank) standards.
Financial and project implementation barriers	
There are significant financial barriers facing implementation of the TSP. The renewable energy technologies proposed by the TSP have high investment costs (relative to the baseline). There is also a lack of credible data concerning the best sites for installing solar technologies. There is currently little understanding of how emerging climate finance schemes, such as sectoral crediting and NAMAs, can assist implementation of the TSP.	Investment in renewable energy technologies (wind, PV and CSP) is typified by high up-front cost, lack of access to long-term financing, and high project development to investment cost ratios. Implementing the TSP will require a cumulative investment of the order to €5-6 billion. Access to finance is difficult in Tunisia largely because of a range of barriers and risks to investment for renewable energy. Providers of finance require a higher return, raising the cost of financing, as compensation for these elevated risks. De-risking investment can be achieved through cornerstone instruments such as a grid code, IER and PPP, which guarantee access to the grid and provide a guaranteed price over a fixed length of time: this will provide private investors with the visibility required to raise necessary capital and to better manage their financial cash flows. The project will examine additional complementary de-risking instruments that can provide project developers with the long-term visibility to invest in renewable energies. The lack of a clear grid code for interconnecting RES to the grid and the absence of an independent regulator increase the investment risks. Since Tunisia is neither an LDC nor a SIDS, it is not eligible to sell CERs generated by CDM projects registered post-2012 into the EU Emissions Trading Scheme (EU-ETS, the largest such market for CDM credits). Also, the price of carbon credits is at a historical low. The UNDP-implemented, GEF-financed project will leverage the acknowledged strengths of the CDM, notably its baseline and MRV systems, while circumventing these weaknesses. It will do so by designing a territorial performance-based mechanism specifically for a NAMA to support the Tunisian Solar Plan and associated regional development prerogatives: incentives to promote investments in RES will be matched with criteria such as renewable energy resource potential, grid coverage, CO_2 emission reductions and sustainable development dividends, with an emphasis on job creation and poverty alleviation (please see Annex 7.6 for an outline of the mechanism). The cost of the emission reductions will be reduced through the application of the complementary de-risking instruments developed under 1.2, 2.1, 2.3, 2.4 and 2.6. Furthermore, the territorial performance-based mechanism (TPBM) will be calibrated using the 24 MW wind farm at Gabes (Output 3.1).

	Outputs 1.3, 2.4, 2.5, 2.6, 3.1. • The two baseline projects that form part of the TSP will be implemented with incremental investment from the UNDP-implemented, GEF-financed project to tackle the wide spectrum of climatic conditions that renewable energy technologies must face in Tunisia, as well as grid instabilities. • Scenario analysis of different financial and policy de-risking instruments will be carried out to inform the best choice of instruments to lower financial barriers to invest in renewable energies. • Passing of a PPP Act and establishment of a grid code as a means to de-risk private investments. The operationalisation of an independent energy regulator is also a policy de-risking instrument that is proposed to reduce risks. • The project will develop (i) an innovative territorial performance-based mechanism for incentivising investments in RES at the regional level that will deliver both emission reductions and sustainable development benefits; and (ii) a supported NAMA tailor-made for the Tunisian Solar Plan, incorporating MRV, institutional and capacity development, and financial mechanisms. • Investment plans will be developed as part of the technology-specific action plans (TAPs). The TAPs will use methodologies developed by the GEF-financed TNA project, coupled with the DREI analyses, to provide an evidence-based approach. Further, the investment plans in the TAPs will be linked to the territorial performance-based instrument (see Annex 7.6 for details) that will be developed in Output 2.7, and also to the restructured Energy Transition Fund that will be developed in Output 2.6.

2. PROJECT STRATEGY

2.1. Rationale and Scope

Tunisia's commitment to promoting and implementing a low-emission development course is clearly expressed in its voluntary emission reduction targets presented to the UNFCCC (Annex 7.1), as well as the host of low-carbon development initiatives described in Sections 1.2.4 and 1.3.2. The NAMAs, and specifically those in the energy sector, clearly demonstrate that the country intends to implement a low-carbon development strategy within the larger context of sustainable development – i.e. mitigation actions that deliver economic, social and environmental co-benefits. Because of the ubiquitous character of the power sector, this implies the coordination of emission reductions efforts across multiple sectors (e.g. buildings and industry). The rationale for selecting the power sector as the focus of the UNDP-implemented, GEF-financed project is straightforward. First, the energy sector is the largest emitter of GHGs in Tunisia (**Table 1**). Second, the power sector is also the most prepared from the perspective of NAMA- and MRV-enabling activities.

During the project preparation phase, the Government of Tunisia and UNDP (as well as other stakeholders) reaffirmed the approach adopted in the PIF and arrived at the conclusion that the project would be more effective by adopting a sectoral approach that would cover the entire Tunisian Solar Plan (TSP). The implementation of a NAMA for the TSP, through the elimination of barriers to catalyse investments in RES, will accelerate the decoupling of GHG emissions from economic growth. Because of the sustainable development dividends that will emanate from the implementation of the TSP, the NAMA TSP can be seen as a vector for green growth in Tunisia. As discussed above, the TSP aims to achieve 30% generation of electricity from wind, PV and CSP in 2030, which will have positive benefits on energy security, the burden of state subsidies in the power sector in the face of rising fuel prices, job creation and reducing GHG emissions (see Section 1.2.4).

By building on past initiatives (e.g. the ANME-UNDP-GEF wind project[70]), and collaborating with ongoing initiatives (e.g. the PMR and GIZ-led inventory and MRV project), the UNDP-implemented, GEF-financed project aims to develop a single and coherent NAMA for the TSP that will be implemented in the form of three technology-specific (i.e. wind, PV, CSP) NAMA actions plans. While the mitigation actions submitted to the UNFCCC list power generation from wind, PV and CSP separately, the NAMA TSP will integrate all of them into a single framework. This approach will serve to market the NAMA TSP as an integrated package to attract financial (international, bilateral, public and private-sector) support. The core components of the TSP NAMA will cover: clear long-term targets, a public instrument package to create an enabled investment environment, assessment of costs and incremental costs, assessment of socio-economic and environmental benefits, and MRV/indicators. Each of these components will be implemented for the three Technology Action Plans (TAPs), which will then be combined into one overall NAMA. The TAPs are necessary to take into account the constraints, barriers to implementation and opportunities that are specific to each technology.

The project is designed in two broad elements: (1) technical assistance – to establish the enabling architecture for a NAMA PST that will require cross-sectoral coordination. This element of the project will also implement targeted public policy de-risking instruments to remove barriers that exist in the baseline, as well as financial de-risking instruments to transfer risks to the public sector. The reduction of risks and the creation of an enabling environment will reduce the cost of financing for RE technologies, hence making electricity generation from RES more competitive, and ultimately increasing investments in RES in the power sector; and (2) investment – the NAMA architecture will be tested by supporting two baseline projects (one public-sector PV project, and one private-sector wind project). The technical assistance and investment components of the UNDP-implemented, GEF-financed project are further detailed in Section 2.2.

Incremental Reasoning

The project's primary added-value is to transform Tunisia's voluntary energy sector mitigation targets set out in the TSP into a structured, feasible and implementable NAMA. This effort will build upon the country's existing NAMA design activities and programmes (Section 1.3). While there have been a number of prior activities to enhance the NAMA-preparedness of Tunisia, Section 1.5 has shown that significant barriers still prevail.

GEF funds will be used to support activities – i.e. incremental investment and removal of the barriers listed in **Table 6** (Section 1.7) – that will not take place in the baseline and yet which will substantially enhance the prospects of both the baseline projects and future projects that all fall under the TSP NAMA. From this perspective, the incremental contribution of the GEF will be significant for scaling-up mitigation actions through the TSP NAMA. By the end of the project, it is expected that:

- The Government will develop, adopt or enhance the legal and regulatory frameworks that will be conducive for private-sector investment in grid-connected renewable electricity.

- Institutional mechanisms will be established to provide high-level political support and coordination for the implementation of the TSP through NAMAs. The institutional structure to provide quality assurance for NAMAs will be established.

- National institutions will have developed in-house skills to carry out dynamic, long-term integrated energy planning to inform the low-carbon development of Tunisia; to compare the relative merits of financial instruments to promote renewable energies under the TSP; and to formulate NAMAs to channel international climate finance to support the implementation of the TSP.

[70] PMIS 967.

- The optimum mix of public policy de-risking and financial de-risking instruments to achieve the objectives of the TSP in a NAMA will be identified, and a road map developed for guiding targeted and coordinated interventions by different stakeholders in the renewable electricity sector (see Section 1.6 and Annex 7.3).

- The two baseline projects will demonstrate improved performance in terms of clean electricity output that is compatible with grid stabilityand the utilisation of technologies that can be adopted by future renewable energy generation projects.

- An MRV system will be designed to provide quality assurance on GHG emission reductions accruing from the TSP NAMA.[71]

- The Energy Transition Fund will be supported to be able to attract financing from a larger spectrum of sources (e.g. multilateral, bilateral, public, private, climate finance, carbon tax, etc.), and to operate different RE financing modalities (e.g. public equity financing, green credit lines, concessional loans, etc.).

The enabling conditions created by the project will have the long-term impact of catalysing private investment to implement the TSP that promises to reduce a cumulative amount of 53 $MtCO_2$ (32.5 $MtCO_2$ related to RES) between 2013 and 2030.

2.2. Project Objective, Outcomes and Outputs

The objective of the project is to support the Government of Tunisia in the development and implementation of a Nationally Appropriate Mitigation Action in the energy sector, namely a NAMA for the TSP. The project will contribute to the achievement of the energy mitigation targets established voluntarily by the Government of Tunisia, which aim to achieve a contribution of 30% electricity produced from wind energy, PV and CSP by 2030.

The project is designed to support both the design and implementation of the NAMA in the energy sector, applying relevant NAMA methodologies and guidance for identifying and designing technology-specific NAMA action plans, and piloting the implementation of the NAMA activities around two baseline projects – a 10 MW public sector PV plant and a 24 MW private sector wind farm. The project will develop a standardised baseline for the electricity sector, including the development of an MRV system. A territorial performance-based mechanism (TPBM) will be designed to achieve penetration of wind, PV and CSP across Tunisia based on several criteria, including renewable energy resource potential, grid coverage and stability, CO_2 emission reductions and sustainable development dividends, with an emphasis on job creation and poverty alleviation in the (sub-national) regions (or governorates). In order to catalyse the necessary levels of financing to implement the TSP NAMA, the Energy Transition Fund will be supported to increase its means of capitalisation, and the fund will be linked to the MRV system to catalyse climate financing.

The project is structured in three components, as described below.

The key focus of the UNDP-implemented, GEF-financed project is to capacitate Tunisia to implement the TSP to its full potential – i.e. 30% renewable electricity generation by 2030 using PV, wind and CSP. A project-based, stand-alone approach, though useful, is not sufficient to achieve this ambitious target. The project will, instead, support the implementation of the TSP through a coherent NAMA that will contain three technology action plans (including investment plans and technology-specific de-risking instruments and incentives (e.g. a 'proxy FiT' based on the TPBM that is explained on page 52 when discussing Component 2 of the project. It will put in place the institutional and policy frameworks necessary to coordinate and support the up-scaling of renewable electricity in Tunisia, as well as developing an architecture for developing

[71] The scope of the MRV system could also be enlarged to cover sustainable development co-benefits that would be mirrored (at least partially) by the NAMA eligibility criteria that will be developed under Component 2.

the TSP NAMA. Besides these two technical assistance components, the project also encompasses an investment component to support two baseline investment projects to enhance their mitigation potential and to be framed as within the TSP NAMA. GEF financing will be used incrementally to create the appropriate institutional, policy and capacity environment in which the identified (and enhanced) baseline projects can be embedded, thereby enhancing their probability of successful implementation; establishing the framework for a programmatic approach to the TSP NAMA; and supporting the pre-conditions for replication in Tunisia and in the broader MENA region.

Component 1: ***The enabling framework and methodologies are established to support the design and implementation of the Tunisian Solar Plan (TSP) NAMA.***

Expected outcomes: The enabling conditions, methodologies and tools are developed for de-risking the national policy environment for implementing the Tunisian Solar Plan through a NAMA.

GEF funding: US$394,945

Co-financing: US$790,000 (ANME: US$190,000; UNDP: US$600,000)

This technical assistance component will address the institutional and policy frameworks that are required to implement the TSP. It seeks to establish high-level political support and coordination mechanisms that will be invaluable for advocating for, and coordinating, mitigation actions across several sectors. The high-level Inter-Ministerial Committee that will be established with the support of the UNDP-implemented, GEF-financed project will be enabled to oversee the ETF that will be supported under Component 2. While the ETF will initially focus exclusively on catalysing financing for implementation of the TSP, it is not excluded that it could in the future expand its scope to cover other NAMAs in the energy sector (e.g. buildings, transport, etc.).[72] Further, the Inter-Ministerial Committee that will be initially set up to carry out cross sectoral coordination for the TSP NAMA could pave the way to a general NAMA committee, subject to Government agreement.

System dynamics modelling (SDM) will be used to study the cross-sectoral impacts of the TSP, including scenario analysis of the cost-effectiveness of financial and economic instruments to promote renewable energy technologies. Calculation of emission reductions is only one of the expected outputs of the SDM. Distinctive value-added aspects of SDM include:

- NAMAs should assist the country in achieving sustainable development, defined through the integration of economy, society and environment. SDM allows the cross-sectoral impacts of NAMAs related to the Tunisian Solar Plan (TSP) to be understood by establishing the causal relationships between NAMAs, economy (e.g. contribution to economic growth and energy savings), society (e.g. job creation and impact of equity) and environment (e.g. emission reductions).
- NAMAs can be supported at the national level using a variety of financial and economic instruments. SDM can be used to investigate the comparative merits of the different instruments based on their overall socio-economic and environmental impacts.
- Any quantitative indicators defined in NAMA-related MRV systems can be embedded within the SDM, thereby providing a dynamic monitoring and evaluation tool. This is a very useful aspect of using SDM to monitor the impacts of policies.
- SDM is a useful tool to integrate the different projects proposed in the TSP to obtain sectoral-level impacts. In this respect, SDM provides an evidence-based approach to justify international funding for scaling-up emission reductions by implementing the TSP.

The SDM will be coordinated with, and will draw heavily from, the forthcoming Third National Communication to the UNFCCC and future BURs. This modelling will be used as an evidence-

[72] This is a conclusion that was reached during the project preparation validation workshop that took place on 4 April 2014 in Tunis.

based approach for allocating Government funds and seeking external funding for the TSP, which is expected to require investment of the order of €5-6 billion.

The DREI analyses that are presented in Section 1.6 and Annex 7.3 will be further developed to propose the most comprehensive and optimal (from cost-benefit and cost-effectiveness perspectives) combination of policy and financial de-risking instruments to minimise the risks to private investments. In addition, the DREI analysis will be used to develop the investment components of the technology-specific action plans (Component 2 – output 2.5). Also, the stakeholder mapping that is presented in Annex 7.4 will be further developed in order to provide a road map for the coordination of stakeholder interventions in supporting the implementation of the TSP NAMA.

Aligned with global best practice in terms of implementing public instruments to de-risk investments in RE[73], this package will be structured around the DREI analysis and a set of complementary supportive de-risking instruments. Cornerstone policy de-risking instruments such as the grid code, IER and PPP legislation that are supported by the UNDP-implemented, GEF-financed project will support all RE projects regardless of the type of technology or geographical location. However, there are risks that will be technology-specific and that will/may vary across the national territory, such as renewable energy resources, social acceptability and grid integration, among other. Consequently, the application of more technology-specific (e.g. CSP not covered in the preliminary DREI analysis carried out in Section 1.6) and spatially-granular DREI analyses will be used during project implementation to develop TAPs. Candidate instruments for inclusion in the package include state-sponsored credit guarantees for IPPs, reduction of import duties on renewable energy hardware, incentives proposed by the TPBM outlined in Annex 7.6, Government support for IPPs' pre-feasibility studies, and labour support to IPPs (such as a state-sponsored apprenticeship programme). However, the composition of the package will depend on (a) the risks identified as being most critical (and hence in need of priority de-risking), (b) the outcome of the participatory decision-making process, and (c) high-level political willingness to adopt particular instruments. In addition to de-risking the general environment for private-sector investment in renewable energy, the package will also have the specific benefit of reducing the unit cost (cost-per-tonne of CO_2) of GHG abatement as shown in **Figure 16(d)** under the performance-based system to be developed under Output 2.7, thereby enhancing its cost-effectiveness.

The SDM and DREI analyses will be carried out in close collaboration with the PMR initiative through for example a common study to choose the optimal and most cost effective policy instruments..

The following outputs will be used to achieve the outcomes of Component 1:

Output 1.1: Establishment of a high-level Inter-Ministerial TSP NAMA Committee

Output 1.2: Establishment of a Secretariat to coordinate energy generation and end-use stakeholders for the TSP NAMA, accompanied by recommendations and the implementation of economic and financial tools and instruments (Output 1.3) to support the implementation of the TSP NAMA

Output 1.3: Use of system dynamics modelling (SDM), DREI analysis (Section 1.6) and scenario analysis to investigate (i) the sectoral emissions reduction potential of the TSP to 2030, (ii) cross-sectoral co-benefits, such as job creation and contribution to economic growth, and (iii) the cost-effectiveness of public instruments identified in Output 1.2 for de-risking investments in the TSP

[73] See, for example, UNDP (2013), *De-Risking Renewable Energy Investment: A Public Instrument Appraisal Framework*, New York.

Component 2: *Architecture for NAMA development is established*.

Expected outcomes: A coherent climate finance framework is established for the development of NAMAs to catalyse the transformational capacity of the TSP to generate large emission reductions.

GEF funding: US$1,212,200

Co-financing: US$13,876,308 (ANME: $13,776,308; Ministry of Equipment, Land Planning and Sustainable Development: $100,000)

This technical assistance component seeks to establish the necessary conditions to leverage financing to support a NAMA in the energy sector – i.e. the TSP NAMA. Prior to being able to attract funding through the restructured Energy Transition Fund to support the implementation of NAMAs, the country must first demonstrate that a thorough and robust methodological approach has been used to develop NAMAs. Minimum standards for NAMA design (e.g. relating to robust MRV systems and greenhouse gas emission reduction estimation methodologies) will be developed and enforced by the DNA. The institutional support that the UNDP-implemented, GEF-financed project will provide to the MELPSD/DNA will be carried out in close collaboration with the PMR initiative in order to capitalise on the synergies offered by the two projects. A technology action plan (TAP) will be developed for each of the three technologies proposed in the TSP (i.e. PV, wind and CSP). Each TAP will detail the means and measures for barrier removal, institutional and capacity development requirements, GHG inventory and MRV structures and processes, and a full description of the geographical location of proposed projects pertaining to that technology based on the territorial approach outlined in Annex 7.6. Each TAP will carry out a detailed investment analysis based on the tools and methodologies developed under Components 1 and 2. Technology-specific barrier and enabling framework analyses using methodologies and tools (e.g. market mapping techniques and Logical Problem Analysis coupled with incremental cost-benefit analysis) developed under the GEF-financed TNA will be carried out. Each TAP will be at the sectoral level, and will, therefore, cover the ensemble of projects that have been identified in the TSP for each technology. This approach also favours the leverage of financing for ensembles of projects, thereby allowing the scaling-up of mitigation actions. In essence, it is the combination of the 3 TAPs that will form the TSP NAMA and serve as operational plans to implement the TSP NAMA.

Component 2 of the project will be implemented in close collaboration with NAMA support projects that are ongoing in Tunisia, and which are discussed in Section 1.3.2. Where possible, NAMA design elements of the project will be 'front-loaded' in the first months of the project so as to facilitate rapid implementation of the NAMA.

This component also addresses regulatory and technical barriers – such as deficiencies in the legal framework for public-private partnerships and the absence of a comprehensive grid code for grid-connected renewable energy – that exist in the baseline and which act to constrain private investment. In order to overcome these regulatory and technical barriers, coordination and collaboration will be sought with the project entitled 'Market development for decentralised solar power in Tunisia'.[74] The Energy Transition Fund will be supported as an instrument to assist Tunisia in managing its engagement with climate finance by facilitating the collection, blending, coordination of, and accounting for, climate finance. Specific objectives of the Fund will be: the collection of sources of funds and directing them towards sustainable energy activities that promote national priorities, notably NAMAs; coordinated country-wide climate change activities to ensure that climate change priorities are effectively implemented; and strengthened capacities for national ownership and management of climate finance. ANME has commissioned a study to investigate the broadening of the sources of fund capitalisation, and

[74] This project is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ). It seeks to support the contributions of a sustainable market for small and medium-sized photovoltaic and solar-thermal energy systems both to sustainable economic development, especially in disadvantaged regions, and to reducing greenhouse gas emissions. For more details about the project please see http://www.giz.de/en/worldwide/24251.html - accessed 14 August 2014.

the UNDP-implemented, GEF-financed project will complement this effort to cover climate finance, carbon taxation, fiscal mechanisms, and donor contributions, among others. Since GEF funds will not be used to capitalise the Energy Transition Fund, the Government's (and hence the project's) focus is on identifying a Fund structure and financing modality that will sustain the Fund over the long-term. The UNDP-implemented, GEF-financed project will collaborate with the PMR initiative to better leverage carbon finance for the implementation of energy mitigation activities for the sustainable development benefit of Tunisia.

Another incremental intervention of the UNDP-implemented, GEF-financed project will be to link the ETF (or dedicated windows of the ETF) to the NAMA MRV system that will be designed. This intervention will be responsive to international financing for supported NAMAs. Evidence of the Government's support this is given in Annex 7.5. The impacts of the proposed project will be disseminated regionally since the Tunisian Solar Plan has a number of national counterparts (e.g. the Moroccan and Egyptian Solar Plans) and, as outlined in the Second National Communication to the UNFCCC (page 151), is a tributary scheme to the regional Mediterranean Solar Plan.

Building on proven CDM elements, such as the CDM grid emission factor tool, the tool to demonstrate additionality, baseline development and the MRV approaches adopted by CDM renewable energy methodologies, the UNDP-implemented, GEF-financed project will adapt these carbon finance building blocks to serve a 'next-generation' scaled-up NAMA approach. GEF funds will be used purely for Technical Assistance purposes – for designing the territorial performance-based mechanism and for developing the relevant institutional capacities within the Tunisian Government.

Also included in this component is the development of a territorial performance-based mechanism (TPBM – Output 2.7). The aim is to create an incentive-based mechanism to promote RES investments across Tunisia, providing sustainable development co-benefits, including the mitigation objectives, of the TSP while avoiding some of the weaknesses of 'first-generation' carbon finance. A geospatial approach to developing the TPBM is described in Annex 7.6. The TPBM will be based on delivering sustainable development benefits to the regions (or governorates) through the promotion of specific (to be determined by geospatial analysis during project implementation) installed capacities of the three RE technologies. It will include region-specific packages of a combination of public de-risking instruments and incentives (where applicable). The incentive, which is here termed a 'proxy FiT', will be based on the difference in LCOEs between the RE-generated electricity and the baseline (which is CCGT electricity in Section 1.6 and Annex 7.3, but could also be another baseline fossil such as coal in the future). The incentive in the TPBM is called a 'proxy FiT' to distinguish it from the full compensation (either through a FiT or negotiated purchase price of electricity in a PPA) that would be required to make RES cost-competitive with the baseline electricity as shown in Figure 15 for wind energy and Figure 7.3.1 for PV.

The TPBM is favoured over full compensation as a more cost-effective mechanism. The DREI analysis shown in Section 1.6 and Annex 7.3 clearly shows that any incremental incentive – i.e. 'proxy FiT' – that will be required to support RES once public instruments are in place in the form of policy and financial de-risking instruments is significantly more cost-effective compared to the situation when full compensation is required in the form of a FiT/PPA. The preliminary DREI analysis carried out in the design of this Project Document shows that a 'proxy FiT' may not even be necessary in the case of wind energy. The de-risking approach proposed in this UNDP-implemented, GEF-financed project rests precisely on the cost-effectiveness of de-risking renewable energy investments through public instruments.

Feed-in tariffs have proven their capacity to catalyse renewable energy investment in the markets where they have been implemented.[75] In Tunisia, as in much of the region, feed-in

[75] See, for example, Glemarec, Y., Rickerson, W., & Waissbein, O. (2012), *Transforming On-Grid Renewable Energy Markets: A Review of UNDP-GEF Support for Feed-in Tariffs and Related Price and Market-Access Instruments.* New

tariffs do not currently attract high-level political support because of their perceived potential to impose cost burdens on low-income electricity consumers and destabilise fragile post-Arab Spring society. The proposed mechanism will be designed to directly reward renewable energy installed capacity or electricity generated. In combination with a package of public de-risking instruments that have high investment and savings leverage ratios, the proposed TPBM will attract political support while circumventing some of the perceived difficulties of a FiT.

Previous studies on the use of FiTs to promote RES in Tunisia have focused primarily on providing full compensation against the fossil fuel baseline without considering the cost-effectiveness of de-risking public instruments.[76] Further, these studies have focused primarily on the quantity of renewable resources to propose FiTs. While renewable energy resources are certainly an important parameter in determining the financial viability of RE projects, the DREI analyses presented in this document have clearly shown that there are other barriers that give rise to risks that increase the cost of capital for RE investments in Tunisia. As discussed in Section 1.6 and Annex 7.3, this is in addition to the fact that full compensation in the form of a FiT may not be the most cost-effective means to promote investments in RES. While the preliminary DREI analyses have concentrated on risks at the national level, the TPBM will bring more granularities in DREI analyses during project implementation to investigate region-specific risks, and their impacts of investments, through its territorial approach.

The policy de-risking instruments designed and implemented under Outputs 1.2, 2.1, 2.3 and 2.4 will serve to reduce the financing costs of renewable energy under the Tunisian Solar Plan, thereby reducing the unit cost (cost-per-tonne of CO_2) of GHG abatement (see **Figure 16(d)**). This will provide more incentive for bilateral donors to support the NAMA TSP (designed with robust in-built performance incentive and MRV systems). Such buyers may choose to purchase emission reductions directly or through capitalisation of the ETF to be supported under Output 2.6.[77] When it is operational, the Green Climate Fund (GCF) may also support the TPBM through the ETF. Further, the TPBM can be funded by the existing means of the ETF (as shown in Section 1.2.4.2, the ETF has an excess of funds) that can be scaled up through additional means of capitalisation such as carbon taxes.

The baseline projects (the 10 MW Tozeur solar plant and the 24 MW Gabes wind farm) will be used to test and calibrate the operation of the TPBM, which will then be opened up to all future eligible grid-connected projects in the TSP NAMA. The baseline projects will not receive any financial incentives. The incrementality of GEF investment support to the baseline projects is justified on the basis of the specific design flaws that were described in Section 1.3 and that are further discussed below.

The outcomes of Component 2 will be achieved through the following outputs:

Output 2.1: Development of a set of guidelines to establish national NAMA eligibility and design criteria

Output 2.2: Provision of technical support to strengthen the institutional structures of the Ministry of Equipment, Land Planning and Sustainable Development as the national coordinating institution and quality assurer for NAMAs

Output 2.3: Establishment of a standardised baseline for calculating emission reductions from grid-connected renewable energy through development of a tool for annually updating the emission factor of the national electricity system

Output 2.4: The development and implementation of the proposed legal framework, including: (1) a Public-Private Partnership Act, (2) a grid code for RES, and (3) an Independent Energy Regulator to promote private investment to support implementation of the TSP NAMA

York.

[76] For example: ANME. (2013). Calcul de tarif d'achat du kWh éolien en Tunisie ; and Meister Consultants Group. (2013). Analyse économique de l'introduction d'un système de tarif d'achat de l'énergie renouvelable en Tunisie.

[77] See, for example, UNDP (2011), *Blending Climate Finance Through National Climate Funds*, New York.

Output 2.5: Development of three comprehensive sectoral NAMA action plans for PV, wind and CSP

Output 2.6: Support to the Energy Transition Fund to facilitate NAMA implementation, and analysis of the following financial instruments to capitalise the fund: concessional loans, green credit lines, fiscal incentives, donor contributions, a carbon tax, and climate finance

Output 2.7: Development and implementation of a territorial performance-based finance instrument (a 'proxy FiT' combined with public de-risking instruments) to catalyse investment for NAMA implementation

Output 2.8: Development of guidelines for environmental and social safeguards of utility-scale RE projects implemented under the TSP NAMA, based on international benchmarks (e.g. World Bank)

Output 2.9: Communication of lessons-learned, experiences and best practices relating to the development of energy NAMAs compiled and disseminated (website, publications, manuals, participation in national, regional and international conferences and fora etc.) for operationalising MENA national solar plans (e.g. Morocco, Jordan, Egypt) and to demonstrate an architecture for leveraging private investments and climate finance

Component 3: ***Design and implementation of an energy sector NAMA to demonstrate the transformational role of the Tunisian Solar Plan to reduce emissions*****.**

Expected outcome - The TSP is operationalised by demonstrating a proof-of-concept energy NAMA with quantified GHG emission reductions.

GEF funding: US$1,776,634

Co-financing: US$47,477,200 (STEG: US$15,675,000; EnerCiel: $31,802,200)

This investment component of the project will achieve three principal impacts: (1) the reliability of renewable electricity generation from the two baseline projects (the 10 MW Tozeur solar plant and the 24 MW Gabes wind farm) will be enhanced as discussed below, thereby ensuring enhanced GHG emission reduction capabilities; (2) the two baseline projects will be implemented as part of the TSP NAMA, with appropriate MRV of emission reductions; and (3) calibration of the territorial performance-based mechanism to be developed under Output 2.7 will be developed in conjunction with the two baseline projects.

A significant proportion (~53%) of the GEF funding (Output 3.1) will be allocated as incremental investment in the two baseline projects in order to enhance their performance in terms of clean electricity output that is compatible with grid stability. In the baseline projects, the voltage fluctuations in the national grid are not taken into account at sub-stations where renewable electricity is injected into the network. The mismatch between voltage generated by the two baseline projects and the grid voltage will lead to losses and sub-optimal performance of the PV and wind power plants. As part of the investment component, the UNDP-implemented, GEF-financed project will support the installation of interface electronics to match the voltage of renewable electricity with that of the national grid. This will be applied to both baseline projects and, once demonstrated for its effectiveness, interface electronics will be applicable to future RE projects covered in the TSP NAMA technology action plans.

Furthermore, renewable energy installations to be developed under the TSP, especially PV and CSP installations and including the 10 MW PV plant at Tozeur, will be exposed to the harsh environment of the southern – Saharan – part of Tunisia. Conventional PV technologies are not designed specifically for desert environments, and this constitutes a weakness of the baseline project (as identified by STEG itself). Hence, GEF investment support will be deployed to test the application of anti-sand-blasting (anti-abrasive) coatings on the PV facility at Tozeur. For control purposes, some PV modules/arrays will not be coated so as to enable comparative analysis. Also, different types of PV technologies will be field-tested at Tozeur to inform technological choices for future PV plants. The PV technologies that will be tested are single-crystalline, multi-crystalline and amorphous silicon-based PV technology and thin films (organic, cadmium telluride/copper indium diselenide family). Further, concentrated PV technologies will be evaluated. These technical tests will be invaluable for the wider MENA region, and hence will be published and disseminated for informing technology choices within Tunisia and in the region. Finally, the GEF investment will test the effectiveness of different cooling systems for PV arrays at Tozeur, since heating (especially in dry weather conditions) will lower the electricity output and hence efficiency of the PV facility. Following this line of incremental thinking, it augurs well for the UNDP-implemented, GEF-financed project that a new facility for manufacturing PV modules that are claimed to be “100% desert proof” has been recently established in Tunisia.[78] During implementation, the characteristics of these “desert proof” PV modules will be investigated for potential application in the 10 MW PV baseline project.

The Output through which the outcome will be achieved is:

Output 3.1: One private-sector supported wind energy project (Gabes 24 MW grid-connected wind farm) and one public-sector supported PV project (Tozeur 10MW PV) are implemented to validate the adopted framework and methodologies

2.3 Project indicators, Risks and Assumptions

2.3.1. Project indicators

In accordance with the GEF-5 Focal Area Objectives, the key success indicators of the project are:

Objective 3 - Promote Investment in Renewable Energy Technologies:

- Favourable policy and regulatory environment created for renewable energy investments
- Investment in RE technologies increased
- GHG emissions avoided

For further details about the related targets, see the project’s results framework in Section 3.

2.3.2. Risks and assumptions

The main identified risks to the successful implementation of the project include:

Risk	Rating	Mitigation measures
Climate Change Risks	Low	The risk that climate change will make it less likely that renewable energy projects will be implemented is low due to: (i) the low climate sensitivity of wind power in Tunisia: as the Second National Communication observes, the occurrence of extreme weather events in the form of wind storms is rare and the impact of higher air temperature on changes in air density (leading to power loss) is insignificant; (ii) the impact of increased cloudiness – impeding solar energy potential – arising from increasing

[78] Please see : http://www.pv-magazine.com/news/details/beitrag/jvg-thoma-establishes-30-mw-pv-module-fab-in-tunisia_100015094/?utm_source=RCREEE+Newsletter+Subscribers&utm_campaign=4c106893f2-EN_395_21_2014&utm_medium=email&utm_term=0_c4fdb77805-4c106893f2-73390305#ixzz32L0UOX5C1.%09http:/www.pv-magazine.com/news/details/beitrag/jvg-thoma-establishes-30-mw-pv-module-fab-in-tunisia_100015094/ - accessed 26 May 2014.

Risk	Rating	Mitigation measures
		Mediterranean evaporation rates is likely to be minimal, confined to specific coastal areas; and (iii) the impacts of future climate change are expected to increase political interest in addressing the drivers of such change through large-scale mitigation actions.
Environmental Risks	Low	Although Decree No. 2005-1991 and the Order of the Minister of Environment and Sustainable Development 2006 do not require an Environmental Impact Assessment (EIA) to be carried out for power plants having an installed capacity less than 300 MW, the two baseline projects have carried out independent EIAs using World Bank standards. In the case of the Tozeur PV project, the Sustainable Development Directive of KfW was also used. Further, the baseline projects have been subject to a screening according to UNDP's Environmental and Social Safeguards. Based on the lessons-learned from the EIAs and screening, a set of guidelines will be developed for future utility-scale RE projects in the TSP. Also, the UNDP-implemented, GEF-financed project will develop NAMA eligibility criteria and indicators to ensure the environmental sustainability of utility-scale RE projects.
Social Risks	Medium	The TSP has been developed and revised since 2009, and it has received significant public visibility. It is also aligned with concurrent large-scale renewable energy generation programmes such as Desertec, the Mediterranean Solar Plan and counterpart programmes in MENA countries that continue to receive world-wide attention. The social acceptability of the TSP is very high in Tunisia, particularly as it is specifically intended to boost job creation (a social and political priority in post-revolution Tunisia). One concern has been the resistance to the TSP shown by STEG employee unions. Discussions with key stakeholders have revealed that the voices of unions have been growing after the revolution in early 2011 but this may be a transient effect. The project will communicate the sustainable development benefits of the TSP and calm fears that promoting private investment in the power sector is equivalent to privatisation of the power sector.
Political Risks	Medium	Since the revolution in early 2011, Tunisia has witnessed several transitional governments. After adoption of the new constitution on 26 January 2014, a new apolitical, technocratic government was put in place to ensure the governance of the nation until the next elections, which are expected to take place in October 2014. This transitional phase is not expected to jeopardise the implementation of the TSP, which attracts cross-party support for its national energy security and job creation benefits. A recent analysis (January 2013) of the vulnerability of Tunisia (and the wider MENA region) to energy and resource scarcities concludes that "Tunisia remains fragile both politically and economically, but there is also potential for the new government to successfully manage this transition".[79] This study also makes the case that addressing the climate-energy-resource security nexus will be vital to establishing socio-political stability in Tunisia.

[79] Mabey N. *et al*. (2013), *MENA Democratic Transition – Delivering Climate, Energy and Resource Security*.

Risk	Rating	Mitigation measures
Financial Risks	Medium	Implementation of the TSP will require approximately €5-6 billion. This substantial sum is well beyond the capacity of the Government of Tunisia to invest. This is the reason why the Government of Tunisia is seeking to attract private investment and international funding. The prevailing conditions pose significant barriers, and hence risks, to catalysing private investment and international funding. The UNDP-implemented, GEF-financed project will actively address these risks by removing key barriers, thereby mitigating financial risks. The design of the project has been informed to a considerable extent by detailed quantitative analysis of financial risks – and their impacts on the cost of capital (debt and equity) – facing renewable energy investments in Tunisia. While the proposed RE Law is expected to promote private investments through IPPs (Section 1.2.4.2), there is still the risk that it may not be promulgated or that there are delays in its promulgation in anticipation of the next parliamentary elections. There is also the risk that the proposed Independent Energy Regulator (IER) will be resisted. In both cases, DREI analysis will be used to demonstrate the significant leverage ratio of the proposed de-risking instruments (e.g. promotion of IPPs and the setting up of a IER, see Section 1.6 and Annex 7.3) to catalyse investments to implemented the TSP NAMA.

2.4. Expected Global, National and Local Benefits

The development of a NAMA in the power sector in Tunisia should be contextualised within the priority of achieving sustainable development. As such, the project is embedded in a context in which the delivery of national socio-economic benefits is equally important to the country's contribution to GHG emission reductions. The identification of cost-effective mitigation measures in the power sector, and their implementation as a TSP NAMA, will provide a clear demonstration of effective mechanisms to integrate national sustainable development and greenhouse gas mitigation goals. Furthermore, the project forms part of Tunisia's ongoing process of defining a low-carbon development strategy (Section 1.3.2), which forms part of a broader process to develop a low-carbon, climate-resilient development pathway for the country.

National benefits

The specific dimensions of the socio-economic benefits to be derived from this project will be clearly spelled out as mitigation option analyses are carried out and NAMA designs are developed. However, the project will fully incorporate the socio-economic dimension in the NAMA design and implementation process. This includes contributing to:

- Increasing security and sovereignty of energy supply at the national level by reducing dependence on imported gas;
- Having high-quality access to energy at competitive prices and reducing the impact on natural resources and environment;
- Increasing social equality and reducing energy poverty, through increased access to quality and affordable energy services, especially in the (sub-national) regions;
- Expanding electricity grid coverage to capitalise on indigenous RES that will facilitate rural electricity programmes using appropriate and cost-effective technologies;

- Facilitating the creation of conditions for sustainable socio-economic development in rural, isolated villages and country borders by improving the quality of life of the rural population and encouraging the promotion of productive uses of energy;
- Developing a vibrant renewable energy supply chain in Tunisia that will generate green jobs;
- Promoting the coordination of financing instruments and tools with public and private entities in order to allow better access to economic resources and financing for projects.

Global Environmental Benefits

Direct GHG emission reductions

Using a grid emission factor of 0.5298 tCO_2/MWh (see calculations in Annex 7.7) for the Tunisian electricity system, the direct emission reductions from the baseline projects are expected to be approximately 8,954 tCO_2/year for the Tozeur 10 MW PV plant and 45,775 tCO_2/year (for the 24 MW Gabes wind farm). During the lifetime of the UNDP-implemented, GEF-financed project, the baseline projects will deliver 218,900 tCO_2 in cumulative emission reductions for the period 2016-2019. Assuming a useful investment lifetime of 20 years, the combined cumulative direct emission reductions will amount to 1.09 $MtCO_2$, at an abatement cost of 3.55 US$GEF/$tCO_2$. This is similar to the values given in the PIF after updating the grid emission factor (see Annex 7.7 for details).

As justified in Annex 7.7, a causality factor of 40% has been applied to the cumulative direct emissions reductions to give adjusted direct project emissions reductions of 0.44 $MtCO_2$. This approach gives a more conservative estimate of direct emissions reductions since the baseline projects would have been implemented in the absence of the UNDP-implemented, GEF-financed project. The causality factor provides a measure of the enhancements that the GEF interventions will bring to the baseline projects, which then allows a more realistic calculation of the cost-effectiveness of GEF interventions. In this scenario, the abatement cost is 8.12 US$GEF/$tCO_2$.

Indirect GHG emission reductions

Indirect emission reductions are expected to be substantial, arising from the policy de-risking, capacity development and institutional strengthening aspects of the project – specifically:

- Output 1.2: Definition and implementation of economic and financial tools to support the TSP.
- Output 2.4: Legal frameworks related to renewable energy developed and adopted to catalyse private investment to support implementation of the TSP.
- Output 2.5: Development of 3 comprehensive technology-specific (wind, PV, CSP) sectoral NAMA action plans.
- Output 2.6: Support to the Energy Transition Fund.
- Output 2.7: Development and implementation of a performance-based emission reduction finance instrument to catalyse investment for NAMA implementation.
- Output 2.8: Dissemination of best practices.

At this stage, it is extremely difficult to predict which tools will actually be adopted by the Government, what form the NAMA action plans will assume and what type of Energy Transition Fund will be established, making estimation of GEF-driven emission reductions challenging. As a conservative approach, indirect emission reductions have been calculated using both the top-down and bottom-up approaches. The detailed calculations are given in Annex 7.7.

Top-down approach

A replication factor of 4 has been applied to the direct project emissions reductions of 1.094 $MtCO_2$. The choice of replication factor is given in Annex 7.7. The top-down approach gives indirect emissions reductions equal to 4.38 $MtCO_2$, and an abatement cost of ~0.81 $US\$GEF/tCO_2$.

Bottom-up approach

The 10-year emissions reductions potential has been calculated as 26.7 $MtCO_2$. In order to be conservative, a weak causality factor of 20% has been applied to give indirect emissions reductions of 5.34$MtCO_2$. This equates to an abatement cost of approximately 0.67 $US\$GEF/tCO_2$. As discussed in Annex 7.7, the bottom-up approach, though being conservative, gives a more realistic representation of indirect emission reductions than the top-down approach.

The project results framework includes indicators to measure the project's contribution in these areas. These emission reductions will be clearly recorded and reported to the GEF Secretariat via the established monitoring and evaluation channels. The strong focus of the project on MRV will facilitate this task.

2.5. Project Rationale and GEF Policy Conformity

The project contributes to GEF Climate Change Focal Area Objective 3, "Promote Investment in Renewable Energy Technologies", by recognising that renewable energy plays a key role not only in reducing GHG emissions, but also in addressing national development priorities such as a broader energy access, energy security, environmental pollution and job creation. In accordance with the adopted strategy, the GEF support under this objective will expand beyond the creation of enabling policy and regulatory tools to promote the implementation of the TSP NAMA. Through a combination of policy and financial de-risking instruments and a performance-based mechanism (the 'proxy FiT' of the Territorial Performance-Based Mechanism) coupled with a national fund to catalyse innovative financing (the Energy Transition Fund), the UNDP-implemented, GEF-financed project will enhance private-sector participation and reduce the delivery risk of GHG emission reductions in the electricity sector.

2.6. Country Ownership: Country Eligibility and Country Drivenness

According to the Instrument for the Establishment of the Restructured Global Environment Facility, Tunisia qualifies for GEF financing on the following grounds:

- It has ratified the UN Framework Convention on Climate Change; and
- It receives development assistance from UNDP's core resources.

The objective of the project is consistent with the voluntary commitments of the Government of Tunisia as shown in Annex 7.1. Furthermore, it is clearly aligned with the mitigation objectives outlined in the Second National Communication to the UNFCCC, submitted to the UNFCCC in February 2014.

As discussed in Section 1, the project is fully consistent with the country's long-term energy strategy as expressed in the updated Tunisian Solar Plan. Tunisia is clearly committed to an energy diversification strategy, which calls for the efficient use of energy and the use of indigenous RES. The country has commenced subsidy reforms in the energy sector that will be deepened over the next 4-5 years; is implementing a number of favourable policies under the forthcoming RE Law; and is developing financial incentives through the ETF. Tunisia has a strong track record of implementing NAMA-preparedness activities, and is participating in innovative global initiatives such as the World Bank's PMR. This context allows the project to develop a coherent NAMA for renewable electricity based on the TSP to support the sustainable development of Tunisia, including the reduction of GHGs.

2.7 Sustainability and Replicability

Sustainability

The innovativeness of the project stems from migrating from a conventional, project-based approach to a sector-wide transformational approach that will also include the testing and implementation of novel policy instruments to scale-up the diffusion of renewable energy technologies. The main barrier to sustainability of the TSP is the ability to attract sufficient private-sector and international funding. The methodological and evidence-based approach promoted by the UNDP-implemented, GEF-financed project, complemented by the establishment of necessary institutional and enabling conditions, will be instrumental in leveraging private and international funding to support the implementation of the TSP.

Further, the project originates from the Government of Tunisia's willingness to establish long-term climate change mitigation targets, placing it in a stable policy context that strongly favours its sustainable development. Furthermore, the concept of NAMAs as a means to engage non-Annex 1 countries in mitigation efforts is embedded in the UNFCCC discussions and negotiations, providing further stability to the project context. Therefore, the conceptual framework of the project is highly likely to be sustainable, as NAMAs will continue to form a part of UNFCCC discussions and Tunisia seeks to achieve its voluntary targets. By linking GHG reduction opportunities and national development priorities, the TSP NAMA can serve as a template for other NAMA activities in the energy sector, as detailed in Annex 7.1.

Replicability

The project is designed to establish a sustainable framework for energy sector NAMA design and implementation. This is intended to trigger the process of implementing NAMA activities in the country and to foster the replication of such activities. The project can expect replication at the following three levels:

Baseline project implementation – The project will facilitate the successful implementation of two baseline projects that form part of the TSP NAMA. These TSP NAMA projects will have a lifespan that extends beyond the duration of the UNDP-implemented, GEF-financed project, and these projects will have catalytic effects as first-of-their-kind in Tunisia. A significant proportion (~53%) of the GEF funding (Output 3.1) will be allocated as incremental investment in the two baseline projects in order to enhance their performance in terms of clean electricity output that is compatible with grid stability. For example, in the baseline projects, the voltage fluctuations in the national grid are not taken into account at sub-stations where renewable electricity is injected into the network. The mismatch between voltage generated by the two baseline projects and the grid voltage will lead to losses and sub-optimal performance of the PV and wind power plants. As part of the investment component, the UNDP-implemented, GEF-financed project will support the installation of interface electronics to match the voltage of renewable electricity with that of the national grid. This will be applied to both baseline projects and, once demonstrated for its effectiveness, interface electronics will be applicable to future RE projects covered in the TSP NAMA technology action plans. Similarly, the incremental investments in desert-proof PV technologies in the Tozeur PV plant will pave the way for the enhanced performance of PV plants that will be installed in desert areas in the future.

Additional TSP NAMA projects – By developing three technology-specific action plans (TAPs), including investment plans, and by developing an optimal combination of cost-effective policy and financial de-risking instruments, it is expected that the private investments will be catalysed effectively to implement the TSP beyond the lifetime of the project. Further, the project will work to identify potential sources of financing to capitalise the restructured ETF to ensure sustainable financing for the TSP NAMA and for future mitigation initiatives. A key indicator of the project's replication success, included in the results framework, is an assessment of how many additional sources of funding have been secured to capitalise the restructured ETF by the end of the project lifetime. The performance-based mechanism, which is based on a territorial approach, will also facilitate the implementation of projects under the TSP NAMA where they would otherwise not have taken place.

<u>Definition of new NAMAs in the energy sector</u> – As described in the sustainability section above, the project aims to develop a NAMA planning framework that allows for the development of new NAMA activities in the energy sector. The voluntary targets established by the Government of Tunisia for the energy sector are ambitious and require significant changes within the sector to be achieved. As shown in Annex 7.1, there are a number of voluntary mitigation actions that go beyond the TSP. As such, the establishment of a well-defined institutional set-up to prioritise actions and design NAMAs is essential to strengthen the country's efforts to achieve its targets. Likewise, the project's support for the establishment of MRV mechanisms will be replicable across NAMAs and will allow for quality reporting of the country's mitigation efforts. Finally, the project will contribute, along with the other ongoing NAMA design and development efforts (Section 1.3.2), to establishing a common energy-related cross-sectoral NAMA design and implementation framework, including the establishment of procedures, protocols and institutional arrangements. This collective effort will ultimately result in the mainstreaming of NAMAs in Tunisia's national development process, which will be vital for steering Tunisia towards a low-carbon development pathway.

3. Project Results Framework

This project will contribute to achieving the following Country Programme Outcome as defined in CPD: Outcome 3: By 2019, the State has put in place a new economic and socially-equitable development model that is inclusive, sustainable and resilient, and generating wealth and jobs; Outcome 4: By 2019, regional stakeholders generate efficiently and use optimally, sustainably and inclusively the resources in regions.
Country Programme Outcome Indicators: Number of regional development plans integrating region-specific potentials and environmental dimensions; contracts in place to enable the reinforced autonomy of regions with financial resources and the necessary human resources
Primary applicable Key Environment and Sustainable Development Key Result Area (same as that on the cover page, circle one): Sustainable Development
Applicable GEF Focal Area Objective: GEF-5 FA Objective: #3 (CCM-3): "Promote Investment in Renewable Energy Technologies"

Objective/ Outcomes	**Indicators**	**Baseline**	**Targets** **End of Project**	**Source of verification**	**Risks and Assumptions**
Objective: To transform Tunisia's energy sector for achieving large-scale emission reductions through the deployment of a TSP NAMA.	- A NAMA developed for the TSP - Quantity of renewable electricity generated by on-grid baseline projects (MWh/year) - Quantity of direct GHG emissions resulting from the baseline projects and TSP NAMA (tCO_2/year)	- No NAMA for the energy sector - No MRV system for monitoring GHG emission reductions in the energy sector - Proposed Gabes and Tozeur RE plants become operational but with deficiencies (e.g. PV plant not designed for desert conditions; weak interface between RE plants and the	- A NAMA developed for the TSP and submitted for registration with the UNFCCC NAMA Registry - 16.9 GWh/yr is generated by 10 MW PV plant at Tozeur; and 86.4 GWh/yr is generated by 24 MW wind farm at Gabes - Emissions reductions: • Total direct emission reductions of 218,900 tonnes CO_{2e} between 2016 and 2019	- Project reports (Quarterly, Annual, PIR, MTE, TE) - Minutes of PSC - UNFCCC NAMA Registry - Energy sector GHG inventory report (First BUR and National Inventory Reports) - MRV mechanism or technology-specific MRV mechanisms	- The Government of Tunisia maintains its commitment to its voluntary GHG abatement initiatives through NAMAs, especially in the energy sector - Detailed sectoral inventory is established and operational in collaboration with GIZ - MRV mechanism(s) developed in collaboration with the PMR initiative

		national grid)			- Implementation barriers (regulatory, financial, technical, technological) have been reduced or overcome

Outcome 1: The enabling conditions, methodologies and tools are developed for de-risking the national policy environment for implementing the Tunisian Solar Plan through a TSP NAMA	- Number of committees established and operational - Energy sector system dynamics model developed and implemented - Number of policy and financial de-risking instruments designed using DREI analysis and implemented	- No high-level Inter-Ministerial TSP NAMA Committee - No cross-sectoral modelling tool exists to investigate the sustainable development (economic, social and environmental) dividends of the energy sector - No methodology is used to quantify risks that hinder investments in RE, and to develop policy and financial de-risking instruments to promote large-scale private investments.	- A high-level Inter-Ministerial TSP NAMA Committee is established - A system dynamics model is developed and implemented for the energy sector - At least 4 policy and financial de-risking instruments have been developed using DREI analysis based on work initiated in the development of the project document.	- Project reports (Quarterly, Annual, PIR, MTE, TE) - Reports on SDM for energy sector - DREI reports	- The Government of Tunisia maintains its commitment to its voluntary GHG abatement initiatives through NAMAs, especially in the energy sector - Continued commitment of the GoT to use an evidence-based approach to advocate for the sustainable development benefits of the TSP NAMA

Outcome 2: A coherent climate finance framework is established for the development of the TSP NAMA to catalyse the transformational capacity of the TSP to generate large emission reductions.	- Number of national guidelines - Number of technical codes - Number of regulations - Number of financial instruments to capitalise the Energy Transition Fund	- Guidelines and SD criteria exist for CDM projects but not for NAMAs - Low institutional capacity of MELPSD to act as the coordinating body and quality assurer for NAMAs in Tunisia - PPPs for developing RE projects do not exist - No grid code for RES is available publicly to project developers - No energy regulator exists in Tunisia' - FNME restructured into the ETF in January 2014 (Articles 67 and 68 of the Finance Law 2014). Diversified sources of capitalisation not	- A set of guidelines and design criteria is developed for all NAMAs by the end of Year 1; a set of social and environmental safeguard guidelines is developed for all utility-scale RE by the middle of Year 2 based on international standards - A grid code is approved by stakeholders and made publicly available by the end of Year 2 - Modalities for PPPs are established in regulations, and the establishment of an IER is supported - The ETF is supported with at least 3 new financial instruments	- Report on standardised baseline tool development and user manual - Project reports (Quarterly, Annual, PIR, MTE, TE) - Minutes of PSC - Legislation/decrees proclaimed - Grid code - IER charter or similar foundational document - 3 TSP NAMA technology action plans - Report detailing the design and establishment of the territorial performance-based mechanism - Report on the design and operationalisation of the environmental and social safeguard guidelines - Lessons-learned report	- GoT maintains its commitment to monitor, report and verify its voluntary NAMA initiatives - GoT supports the facilitation of private-sector investment in the energy sector - Institutional support of STEG is obtained - GoT support for the establishment and operationalisation of an IER - ANME maintains its commitment to restructure the ETF - GoT maintains its commitment to the sustainable development of Regions through the TSP NAMA

		sufficient to support the implementation of the TSP NAMA - No social and environmental safeguards are required under current legislation for projects with installed capacity below 300 MW			

Outcome 3: The TSP is operationalised by demonstrating a proof-of-concept energy NAMA with quantified GHG emission reductions.	- Emission reductions from grid-connected wind and PV power - Number of households benefiting from electricity generated by wind and PV plants (households/year)[80]	- Baseline projects implemented with identified deficiencies - No MRV protocol / system for TSP NAMA	- 8,954 tCO_{2e}/year from 10 MW PV plant at Tozeur (35,815 tCO_{2e} between 2016 and 2019) - 45,775 tCO_{2e}/year from 24 MW PV plant at Gabes (183,100 tCO_{2e} between 2016 and 2019) Number of households benefiting from renewable energy by end of project:[81] - 11,544 from PV; - 50,016 from wind	Project reports (Annual, PIR, MTE, TE) and minutes of PSC	- Baseline projects do not suffer major alterations in scope or financing - Grid-connected, utility-scale private sector projects are supported through forthcoming RE Law - Standardised baseline for national grid has been developed - National MRV system is in place

[80] The targets are based on average electricity consumption of approximately 1,464 kWh/household in 2011 calculated using the following data: (1) population = 10,673,800 persons - http://www.ins.nat.tn/indexen.php; (2) average number of persons per household = 4.28 - http://www.britishcouncil.org/learning-skills-for-employability-tunisian-country-income-and-wealth.htm; and (3) electricity consumed by the residential sector ~ 3,650 GWh (ANME, 2013).

[81] These targets assume that all electricity is fed into the national grid as opposed to self-consumption.

3.1. Total Budget and Work Plan

Table 7. Allocation of GEF budget and work plan.

Award ID:	00081769	Project ID(s):	00090941
Award Title:	NAMA Support for TSP		
Business Unit:	TUN10		
Project Title:	NAMA Support for the Tunisian Solar Plan (TSP)		
PIMS no:	5182		
Implementing Partner (Executing Agency)	National Agency for Energy Conservation (ANME)		

GEF Outcome/Atlas Activity	Responsible Party/ Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Account Code	ATLAS Budget Description	Budget Note	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)
OUTCOME 1: The enabling conditions, methodologies and tools are developed for de-risking the national policy environment for implementing the Tunisian Solar plan.	ANME	62000	GEF	71200	International Consultants	1	15,000	73,245	75,400	25,000	28,800	217,445
				71300	Local Consultants	1	10,000	15,000	10,000	10,000	10,000	55,000
				71400	Contractual Services - Individ	1	16,500	0	0	16,500	0	33,000
				72200	Equipment and Furniture	5	10,000	5,000	5,500	2,500	3,000	26,000
				71600	Travel	2	1,500	5,000	5,000	5,000	5,000	21,500
				74200	Audio Visual&Print Prod Costs	3	5,000	0	5,000	5,000	5,000	20,000
				75700	Training, Workshops and Confer	4	2,000	6,000	6,000	5,000	3,000	22,000
					sub-total GEF		**60,000**	**104,245**	**106,900**	**69,000**	**54,800**	**394,945**
		4000	UNDP	71200	International Consultants	1	33,000	75,000	75,000	40,000	30,000	253,000
				71300	Local Consultants	1	20,000	50,000	50,000	25,000	20,000	165,000
				71600	Travel	2	2,000	7,000	7,000	7,000	7,000	30,000
				72100	Contractual Services - Company	1	25,000	25,000	25,000	25,000	25,000	125,000

				75700	Training, Workshops and Confer	4	2,000	6,000	6,000	6,000	7,000	22,000
					sub-total UNDP		**82,000**	**163,000**	**163,000**	**103,000**	**89,000**	**600,000**
					sub-total Outcome 1		**142,000**	**267,245**	**269,900**	**172,000**	**143,800**	**994,945**
OUTCOME 2: A coherent climate finance framework is established for the development of NAMAs to catalyze the transformational capacity of the TSP to generate large emission reductions.	ANME	**62000**	**GEF**	71200	International Consultants	1	20,000	120,000	140,000	130,000	41,200	451,200
				71300	Local Consultants	1	20,000	70,000	90,000	90,000	50,000	320,000
				71400	Contractual Services - Individ	1	0	16,500	0	0	16,500	33,000
				71600	Travel	2	10,000	25,000	25,000	25,000	18,000	103,000
				72200	Equipment and Furniture	5	12,000	12,000	12,000	12,000	12,000	60,000
				74200	Audio Visual&Print Prod Costs	3	10,000	20,000	20,000	20,000	35,000	105,000
				75700	Training, Workshops and Confer	4	15,000	30,000	30,000	30,000	35,000	140,000
					sub-total GEF		**87,000**	**293,500**	**317,000**	**307,000**	**207,700**	**1,212,200**
					sub-total Outcome 2		**87,000**	**293,500**	**317,000**	**307,000**	**207,700**	**1,212,200**
OUTCOME 3: The TSP NAMA is operationalized by demonstrating proof-of-concept RE projects with quantified GHG emission reductions.	ANME	**62000**	**GEF**	71200	International Consultants	1	10,000	30,000				40,000
				71300	Local Consultants	1	10,000	10,000				20,000
				71400	Contractual Services - Individ	1	0	0	16,500	0	0	16,500
				71600	Travel	2	3,000	3,000	2,000	1,000		9,000
				72200	Equipment and Furniture	5	480,000	1,211,134				1,691,134
					sub-total GEF		**503,000**	**1,254,134**	**18,500**	**1,000**	**0**	**1,776,634**
					sub-total Outcome 3		**503,000**	**1,254,134**	**18,500**	**1,000**	**0**	**1,776,634**
PROJECT MANAGEMENT	ANME	**62000**	**GEF**	71400	Contractual Services - Individ	1	24,338	24,338	24,338	24,338	24,338	121,689
				75700	Training, Workshops and Confer	4	5,000					5,000
				74599	UNDP cost recovery charges	6	5,000	5,000	5,000	5,000	5,000	25,000

				74100	Professional Services	7	3,500	3,500	3,500	3,500	3,500	17,500
					Total Management GEF		**37,838**	**32,838**	**32,838**	**32,838**	**32,838**	**169,189**
				PROJECT TOTAL (GEF)			**687,838**	**1,684,717**	**475,238**	**409,838**	**295,338**	**3,552,968**
				PROJECT TOTAL (UNDP)			**82,000**	**163,000**	**163,000**	**103,000**	**89,000**	**600,000**
				PROJECT TOTAL (GEF + UNDP)			**769,838**	**1,847,717**	**638,238**	**512,838**	**384,338**	**4,152,968**

Category	Budget notes
International consultancy	708,645
National consultancy and project staff	516,689
Travel	133,500
Print/Publications	125,000
Workshops	167,000
Equipment	1,777,134
Direct Project Costs (Annex 7.9)	25,000
Audit	17,500

Budget Notes

1- Summary terms of reference for project staff, local consultancies, and international consultancies can be found in Annex 7.8.
2- Estimated travel costs are for internal travel within Tunisia, taking into consideration the fact that many project implementation activities will be conducted at the regional and local level. Significant levels of co-financing will be used to support the total project travel costs. Travel of international consultants is included within the international consultancy budget as the procurement process will require international consultancies to include their travel costs within their offers.
3- Project printing and publication costs are kept to a minimum and co-financing resources will primarily be used for this purpose.
4- The workshop and consultation budget is designed to support a thorough and continuous stakeholder consultation process throughout the project. Nevertheless, co-financing will be used for this purpose and joint workshops with other programmes will be planned to foster collaboration and avoid duplication.
5- Equipment costs are primarily allocated to the implementation support provided for baseline project enhancements. These costs will include the procurement of interface electronics to interconnect renewable electricity to the national grid; enhancing the performance of PV modules through a combination of anti-blasting coatings and/or 'desert proof' module technologies.
6- Direct project costs – these costs, based on the Universal Price List, are agreed between the Government of Tunisia and UNDP for project execution services above and beyond those covered by the implementing agency fee: please refer to Annex 7.9 for a budget breakdown. An LoA will be signed with the Government of Tunisia – see Annex 7.9 for the draft LoA.
7- Audit – These are mandatory audit costs. Audit should be undertaken annually as indicated in the UNDP financial rules and regulations.

Summary of funds

Source of funding	Amount (USD)	Amount (USD)	Amount (USD)	Amount (USD)	Amount (USD)	Amount (USD)

	Year 1	Year 2	Year 3	Year 4	Year 5	Total
GEF	687,838	1,684,717	475,238	409,838	295,338	3,552,968
UNDP	82,000	163,000	163,000	103,000	89,000	600,000
National Government (cash and in-kind)	16,308,328	7,398,328	2,783,328	2,783,328	2,033,328	31,306,640
Private Sector (cash)	25,107,000.00	8,369,000.00				33,476,000.00
TOTAL	**42,185,166.00**	**17,615,045.00**	**3,421,566.00**	**3,296,166.00**	**2,417,666.00**	**68,935,608.00**

3.2 Summary of project co-financing (in US$)

Table 8. Allocation of project co-financing.

		ANME†	Ministry of Equipment, Land Planning & Sustainable Development (MELPSD)	STEG	ENERCIEL/ UPC	UNDP	Total
Outcome 1	Cash					600,000	**600,000**
	In-kind	190,000					**190,000**
Outcome 2	Cash	13,781,308					**13,781,308**
	In-kind		95,000				**95,000**
Outcome 3	Cash			15,675,000	31,802,200		**47,477,200**
	In-kind						
Project management	Cash	725,332		825,000	1,673,800		**3,224,132**
	In-kind	10,000	5,000				**15,000**
Total		14,706,640	100,000	16,500,000	33,476,000	600,000	**65,382,640**

† The ANME co-financing also covers GIZ co-financing sources that are related to projects implemented by ANME.

The letters of co-financing are found in Annex 7.5.

4. PROJECT MANAGEMENT ARRANGEMENTS

This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Tunisia and the United Nations Development Programme, signed by the parties on 25 April 1987. The project will be nationally implemented (NIM) by ANME for the Government of Tunisia. UNDP will be accountable for the disbursement of funds and the achievement of the project goals, in accordance with the approved work plan. The implementing agency, ANME, will assign a senior officer as a Project Director to: i) coordinate the project activities with the activities of other Government entities; and ii) certify that the expenditures are in line with the approved budgets and work-plans. The organisational structure of the project is shown in **Figure 17**.

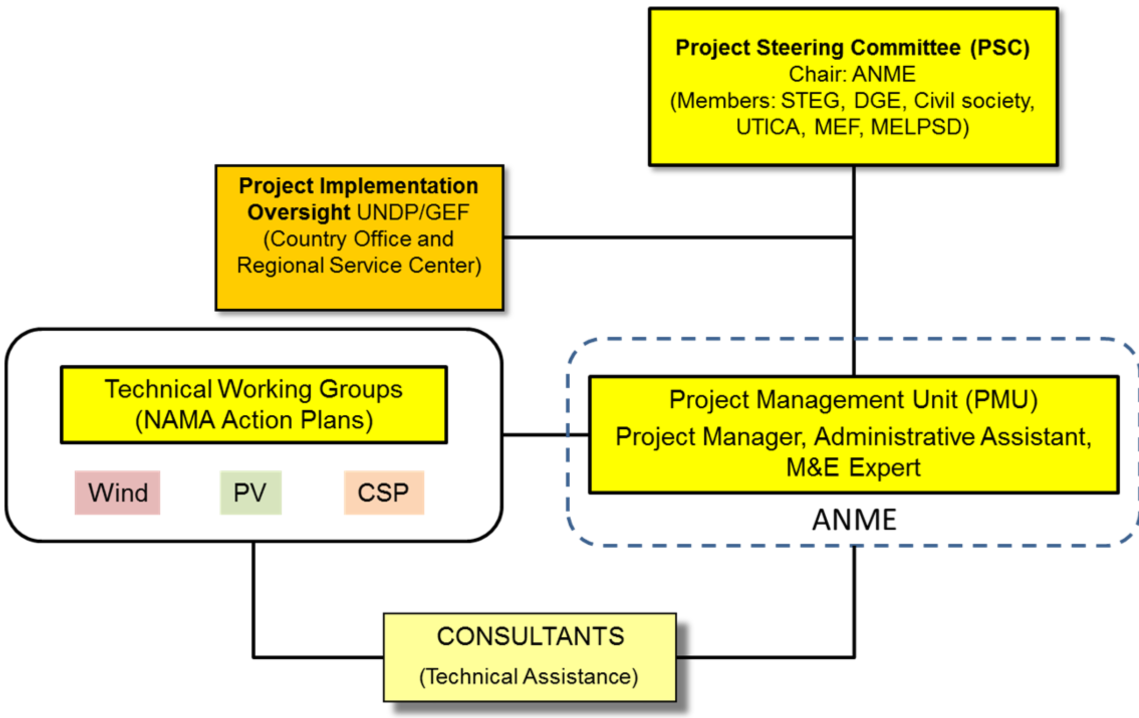


Figure 17. Project management structure.

A Project Steering Committee (PSC) will be established at the inception of the project to monitor project progress, to guide project implementation and to support the project in achieving its listed outputs and outcomes. This Committee will consist of ANME, the Ministry of Equipment, Land Planning and Sustainable Development, the Ministry of Finance, the Ministry of Economic Development and International Cooperation, STEG, the Energy General Directorate (of the Ministry of Industry), UTICA and CSO representatives. UNDP will participate as the GEF Implementing Agency. Other members can be invited at the decision of the PSC on an as-needed basis, but taking due regard that the PSC remains sufficiently lean to be operationally effective. The final list of the PSC members will be completed at the outset of project operations and presented in the Inception Report by taking into account the envisaged role of different parties in the PSC. The Project Manager will participate as a non-voting member in the PSC meetings and will also be responsible for compiling a summary report of the discussions and conclusions of each meeting.

A Project Management Unit (PMU) under the overall guidance of the Project Steering Committee will carry out the day-to-day management of the project. The PMU will be established within ANME and will coordinate its work with the PSC. The Project Manager will report to UNDP, the executing agency (ANME) and the PSC. The Terms of Reference of the key project personnel are presented in Annex 7.8. The project personnel will be selected on a competitive basis in accordance with the relevant UNDP rules and procedures and in consultation with the UNDP-GEF Regional Technical Advisor.

The project manager will be supported by international and national experts taking the lead in the implementation of specific technical assistance components of the project. Contacts with experts and institutions in other countries that have already gained experience in developing and implementing renewable energy policies and financial support mechanisms are also to be established.

UNDP will maintain the oversight and management of the overall project budget. It will be responsible for monitoring project implementation, timely reporting of the progress to the UNDP Regional Support Centre in Istanbul, Turkey and the GEF, as well as organising mandatory and possible complementary reviews, financial audits and evaluations on an as-needed basis. It will also support the executing agency in the procurement of the required expert services and other project inputs and administer the required contracts. Furthermore, it will support the coordination and networking with other related initiatives and institutions in the country. A Letter of Agreement (Annex 7.9) describes all additional services required of UNDP beyond its role in oversight between the IP and UNDP. The direct project costs requested of UNDP are also detailed in the Total Budget Work Plan.

For successfully reaching the objective and outcomes of the project, it is essential that the progress of different project components be closely monitored both by the key local stakeholders and authorities as well as by project's international experts, starting with the finalisation of the detailed, component-specific work plans and implementation arrangements and continuing through the project's implementation phase. The purpose of this monitoring is to facilitate early identification of possible risks to successful completion of the project together with adaptive management and early corrective action, when needed.

5. MONITORING FRAMEWORK AND EVALUATION

The project will be monitored through the following M&E activities.

5.1. Project Start

A Project Inception Workshop will be held within the first 2 months of project start with those who were assigned roles in the project organisation structure, the UNDP Country Office, as well as the coordinator of the UNDP and relevant stakeholders of the project including public, private and civil society organisations. The Inception Workshop is crucial to building ownership for the project results, to generate agreements related to the objectives of the project and to plan the first year annual work plan.

The Inception Workshop should address a number of key issues including:

1. Assisting all partners to fully understand their roles and responsibilities in the project context and take ownership of the process. Discuss the roles, support services and complementary responsibilities of UNDP and the PSC vis-à-vis the PMU. Discuss the roles, functions and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for the PSC and project staff will be validated.

2. Based on the validated project results logical framework, the detailed first year work plan will be finalised. This process will help review and agree on the indicators, targets and their means of verification, and re-check assumptions and risks.
3. Providing a detailed overview of the reporting, monitoring and evaluation (M&E) requirements. The Monitoring and Evaluation work plan and budget should be agreed on and scheduled.
4. Explaining and elaborating on the financial reporting procedures and obligations, as well as arrangements for an annual audit, if required.
5. Planning and scheduling Project Steering Committee meetings. Roles and responsibilities of all project organisation structures should be clarified and the meetings planned according to the milestones defined in the work plan during the first quarter of the project. The first Project Steering Committee meeting should be held within the first 6 months following the inception workshop.

An Inception Workshop report will be drafted and shared with the participants. This document will serve as a key reference document and as a way to formalise various agreements and plans agreed on during the meeting.

5.2 Quarterly

The Project Manager shall report progress made using the reporting format provided by UNDP. Based on the initial risk analysis submitted, the risk log shall be regularly updated. Risks become critical when the impact and probability are high. Note that for UNDP-implemented, GEF-financed projects, all financial risks associated with the financial instruments proposed as part of the project are automatically classified as critical on the basis of their innovative nature (high impact and uncertainty due to no previous experience justifies classification as critical).

The UNDP Implementation Officer will hold quarterly meetings with the PMU, or more frequently if necessary. This will allow the parties to conduct periodic assessments and solve problems related to the project in a timely manner to ensure smooth implementation of project activities.

5.3 Annually

The annual Project Review/Project Implementation Reports (APR/PIRs) will be the responsibility of the UNDP Implementation Officer with support from the PMU. This report is prepared to monitor progress made since project start, especially for the previous reporting period. The APR/PIR combines both UNDP and GEF reporting requirements.

The APR/PIR includes, but is not limited to, reporting on the following:

- Progress made toward project objective and project outcomes – each with indicators, baseline data and end-of-project targets (cumulative)
- Project outputs delivered per project outcome (annual)
- Lessons-learned/good practice
- Annual Work Plan and other expenditure reports
- Risk and adaptive management

The PMU will develop a detailed programme of monitoring and will review meetings, consultations with partners who will implement the project and relevant stakeholders that have been incorporated into the inception workshop report. The schedule will include: (i) a tentative agenda for meetings of the Project Steering Committee and other relevant advisory and/or coordination mechanisms if appropriate, and (ii) activities related to M & E of the project.

Day-to-day monitoring of the progress of project implementation will be the responsibility of both the Project Manager and UNDP Implementation Officer, based on the annual work plan and its indicators. The Project Manager will report to the UNDP Implementation Officer any delays or difficulties that take place in the project development, for the adoption of corrective measures in time and support or appropriate remedial actions.

5.4. Mid-Term of Project Cycle

The project will undergo a Mid-Term Review by an independent consultant at the mid-point of project implementation (July 2017). The Mid-Term Review will determine progress being made toward the achievement of outcomes, and will identify course corrections if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; it will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. The findings from this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organisation and timing of the Mid-Term Review will be decided after consultation between the parties regarding the project document.

A GEF Climate Change Mitigation Tracking Tool will be completed at the mid-term of the project.

5.5. End of Project

A Final Evaluation Report will be prepared by an independent evaluator during a three-month period prior to the final Project Steering Committee meeting. The final evaluation will focus on the delivery of the project's results as initially planned (and as corrected after the Mid-Term Review, if any such correction takes place). The final evaluation will look at the impacts and sustainability of results, including the contribution to capacity development and the achievement of global environmental benefits/goals.

During the last three months, the PMU will prepare the Project Terminal Report. This comprehensive report will summarise the results achieved (objectives, outcomes, outputs), lessons-learned, problems met and areas where results may not have been achieved. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the project's results.

A GEF Climate Change Mitigation Tracking Tool will be completed at the end of the project.

5.6. Audit Clause

The audit will be conducted in accordance with UNDP financial rules and regulations and applicable audit policies on UNDP projects.

5.7. Learning and Knowledge Sharing

Results from the project will be shared within and beyond the project intervention zone through existing information-sharing networks and forums at the national, sub-national, regional and global levels.

The project will identify and participate, if considered relevant and appropriate, in scientific, policy-based and/or any other networks which may be considered beneficial to project implementation, providing access to lessons-learned and contributing to its replicability.

5.8. Communications and Visibility Requirements

Full compliance is required with the UNDP's Branding Guidelines. These can be accessed at http://intra.undp.org/coa/branding.shtml, and specific guidelines on UNDP logo use can be accessed at: http://intra.undp.org/branding/useOfLogo.html. Amongst other things, these guidelines describe when and how the UNDP logo needs to be used, as well as how the logos of donors to UNDP projects need to be used. To avoid any doubt, when logo use is required, the UNDP logo needs to be used alongside the GEF logo. The GEF logo can be accessed at: http://www.thegef.org/gef/GEF_logo. The UNDP logo can be accessed at http://intra.undp.org/coa/branding.shtml.

Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf.

Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications and on vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

5.9. M & E Work plan and Budget

Type of M&E activity	Responsible Parties	Budget $US ***Excluding project team staff time***	Time frame
Inception Workshop and Report	Project Manager, PSC, UNDP Tunisia, UNDP-GEF	Indicative cost: $5,000	Within first two months of project start up
Measurement of Means of Verification of project results.	UNDP Tunisia / Project Manager & M&E Expert	None	Start, mid- and end of project (during evaluation cycle) and annually when required
Measurement of Means of Verification for Project Progress on output and implementation	Oversight by Project Manager Project team	To be determined as part of the Annual Work Plan's preparation.	Annually, prior to ARR/PIR and the definition of annual work plans
ARR/PIR	Project Manager and team UNDP Tunisia, UNDP-GEF	None	Annually
Periodic status/ progress reports	Project Manager and team (PMU)	None	Quarterly
Mid-Term Review	Project Manager and team (PMU) UNDP Tunisia, UNDP-GEF External Consultants (i.e. review team)	Indicative cost: $10,400	At the mid-point of project implementation
Final Evaluation	Project Manager and team (PMU) UNDP Tunisia, UNDP-GEF External Consultants (i.e. evaluation team)	Indicative cost: $18,800	At least three months before the end of project implementation
Project Terminal Report	Project Manager and team (PMU) UNDP Tunisia External Consultants	None	At least three months before the end of the project
Audit	UNDP Tunisia Project Manager and team (PMU)	Indicative cost per year: $3,500 for a total of $17,500 (for 5 years)	Yearly
Visits to field sites	UNDP Tunisia Government representatives (PSC)	For UNDP-implemented, GEF-financed projects, paid from IA fees and operational budget	Yearly
TOTAL indicative COST Excluding project team staff time and UNDP staff and travel expenses		**$US 51,700**	

6. Legal Context

This document, together with the CPAP signed by the Government and UNDP, which is incorporated by reference, constitute together a Project Document as referred to in the SBAA. All CPAP provisions apply to this document.

Consistent with Article III of the Standard Basic Assistance Agreement, the responsibility for the safety and security of the implementing partner and its personnel and property, and of UNDP's property in the implementing partner's custody, rests with the implementing partner.

The implementing partner shall:

- Put in place an appropriate security plan and maintain the security plan, taking into account the security situation in the country where the project is being carried;
- Assume all risks and liabilities related to the implementing partner's security, and the full implementation of the security plan.

UNDP reserves the right to verify whether such a plan is in place, and to suggest modifications to the plan when necessary. Failure to maintain and implement an appropriate security plan as required hereunder shall be deemed a breach of this agreement.

The implementing partner agrees to undertake all reasonable efforts to ensure that none of the UNDP funds received pursuant to the Project Document are used to provide support to individuals or entities associated with terrorism and that the recipients of any amounts provided by the UNDP hereunder do not appear on the list maintained by the Security Council Committee established pursuant to resolution 1267 (1999). The list can be accessed via http://www.un.org/Docs/sc/committees/1267/1267ListEng.htm. This provision must be included in all sub-contracts or sub-agreements entered into under this Project Document.

7. ANNEXES

Annex 7.1. Voluntary Nationally Appropriate Mitigation Actions (NAMAs) of Tunisia

Botschaft
der Tunesischen Republik
Berlin

سفارة الجمهورية التونسية
برلين

N° 149 /Coop

Note Verbale refer log 503-10

L'Ambassade de la République Tunisienne à Berlin présente ses compliments au Secrétariat de la Convention cadre des Nations Unies sur les Changements Climatiques et, se référant à la Note verbale du Ministère tunisien des Affaires Etrangères n°526 du 11/02/2010 relative à la décision de la Tunisie de s'associer à l'Accord de Copenhague, a l'honneur de lui faire parvenir, ci-joint, une note complémentaire, en versions française, arabe et anglaise, transmettant les actions d'atténuation appropriées au niveau national (NAMAs) que la Tunisie suggère de mettre en œuvre au titre du paragraphe 5 de l'Accord de Copenhague. Ces informations concernant ces « NAMAs », à ajouter à la liste de l'Annexe II (Appendix II) de l'Accord de Copenhague, sont mentionnées dans une annexe, également ci-jointe, en versions française, arabe et anglaise.

L'Ambassade souhaite préciser que ces actions d'atténuation appropriées au niveau national (NAMAs) proposées par la Tunisie requièrent, aux fins de leur mise en œuvre, un appui international en termes de financement, de transfert de technologies et de renforcement des capacités. De plus, le recours au Mécanisme de Développement Propre du Protocole de Kyoto n'est nullement exclu.

L'Ambassade de la République Tunisienne à Berlin saisit cette occasion pour renouveler au Secrétariat de la Convention cadre des Nations Unies sur les Changements Climatiques les assurances de sa haute considération.

Berlin, le 17.05.2010

1281

UNFCCC No: Date: 18. MAI 2010

Secrétariat de la Convention des Nations Unies
Sur les Changements Climatiques
P.O Box 260124
D-53153 Bonn

Botschaft der Tunesischen Republik, Lindenallee 16 - 14050 Berlin - Tel.: 030/364 10 70 - Fax 030/30 82 06 83

REPUBLIC OF TUNISIA

***

MINISTRY OF ENVIRONMENT
AND SUSTAINABLE DEVELOPMENT

Subject: Draft note in addition to the Note Verbale addressed by the Ministry of Foreign Affairs to the UNFCCC Secretariat on the decision of Tunisia to associate itself with the Copenhagen Accord.

Following the Note Verbale dated February 11th 2010, addressed by the Ministry of Foreign Affairs of the Republic of Tunisia to the UNFCCC Secretariat, on the decision of Tunisia to associate itself with the Copenhagen Accord, the objective of this note is to submit to the UNFCCC Secretariat the information on the Nationally Appropriate Mitigation Actions (NAMAs) that Tunisia suggests to implement in accordance with paragraph 5 of the Copenhagen Accord.

It is important to underline that these NAMAs, which are voluntary in nature and consistent with the sustainable development of Tunisia, will be implemented in accordance with the provisions of Articles 4.1 and 4.7 of the UNFCCC.

In addition, and according to the relevant provisions of the Copenhagen Accord, it is important to underline that international support in terms of finance, technology transfer and capacity building is needed to implement the NAMAs proposed by Tunisia. Furthermore, the use of the Clean Development Mechanism (CDM) under the Kyoto Protocol is not excluded.

Information regarding these NAMAs, to be added to the list of Appendix II of the Copenhagen Accord, are mentioned in the Annex to this additional note.

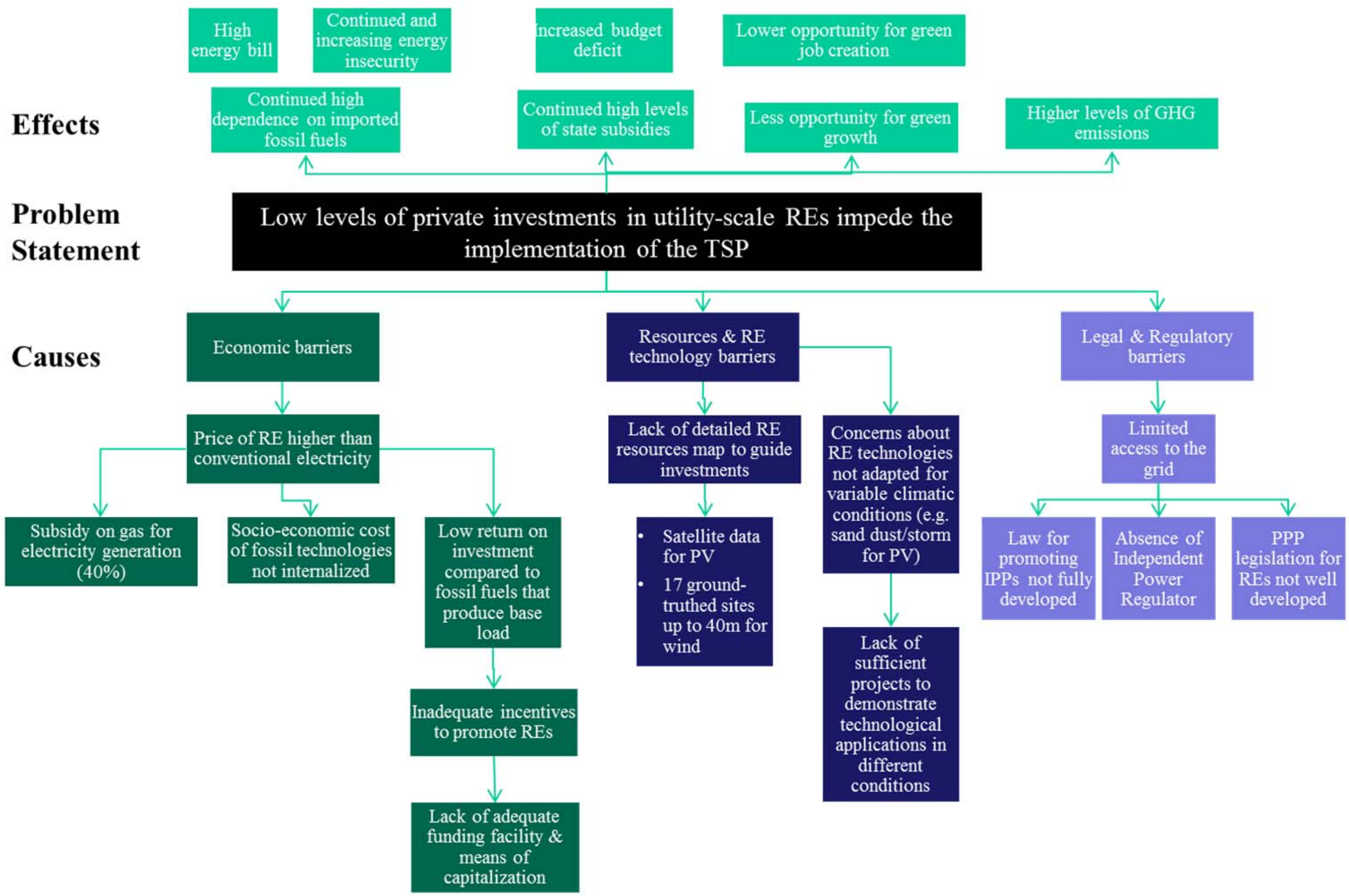
APPENDIX II

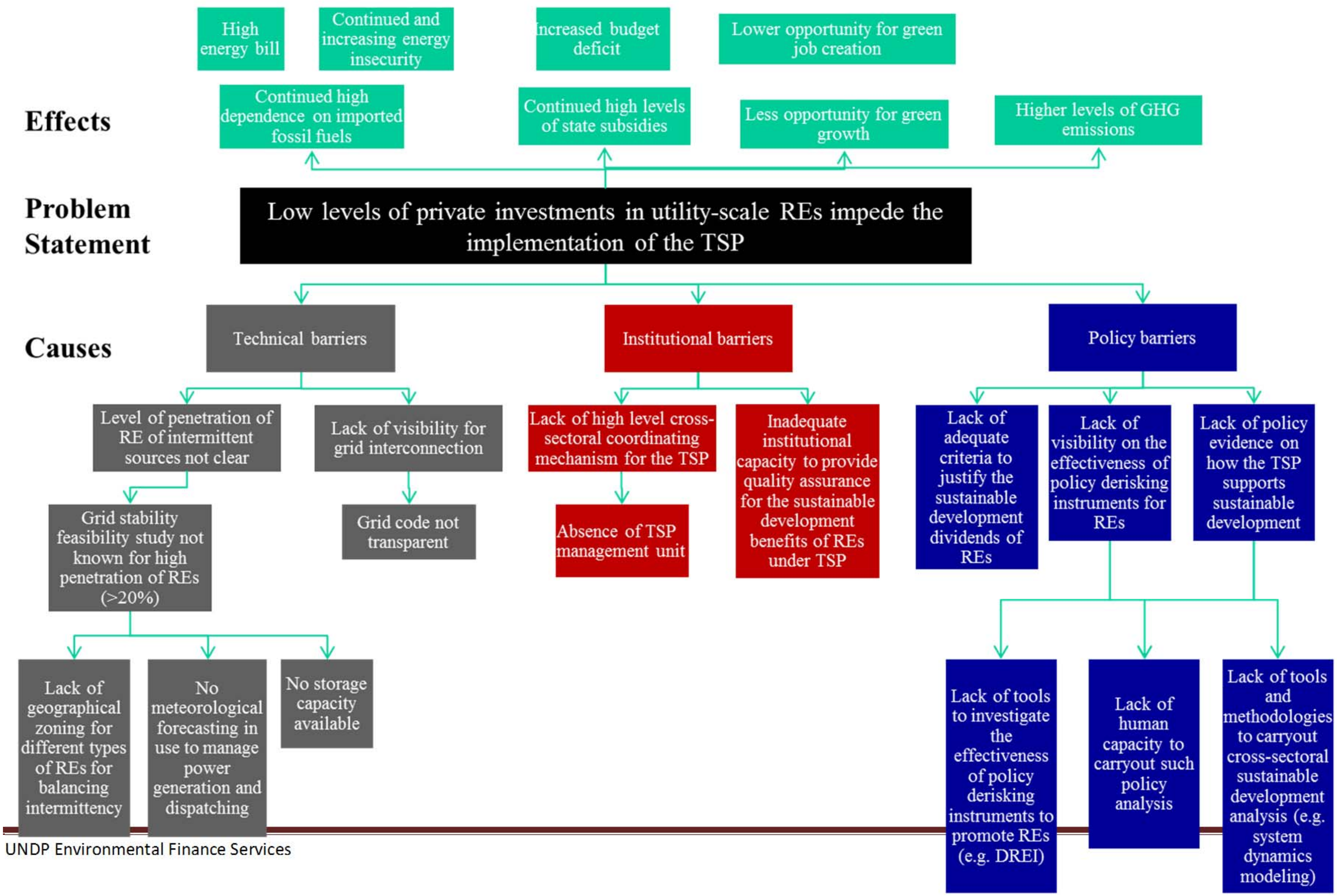
Nationally Appropriate Mitigation Actions of Developing Country Parties - TUNISIA

Non-Annex I	Actions
TUNISIA	**Actions for the development of renewable energies, including energy valorisation of solid and liquid wastes:** - Electricity generation from concentrated solar power (CSP); - Electricity generation from solar photovoltaic; - Electricity generation in buildings from solar photovoltaic; - Intensification of solar water heating; - Energy production from wind; - Energy valorisation of solid and liquid wastes (electricity generation and biofuels) - Energy valorisation of the methane emanating from controlled landfills and from wastewater treatment plants; - Energy production from biomass; - Valorisation of solar and wind energies for water desalinisation and pumping.
	Actions for the development of alternative energies: - Development of the natural gas in the industrial, tertiary and residential sectors; - Development of other alternative energies having low greenhouse gases emissions; - Promoting the use of clean energies, especially compressed natural gas in the transport sector.
	Actions for the energy efficiency and the sound use of energy: - Promoting the collective transport (metro, train and bus in dedicated lanes) in the cities; - Development of urban transport plans in the cities; - Creating logistical areas and specialised economic poles to bring together transport needs; - Development of multi-modal transport and the transport of trucks by railways; - Consolidating the role of railway transport in economic activity; - Constructing buildings and houses that meet energy efficiency requirements; - Constructing solar-energy houses; - Improving energy efficiency in buildings; - Certification of household electrical appliances; - Diffusion and the development of the use of energy-saving light bulbs; - Development of cogeneration and trigeneration; - Development of energy efficient programme contracts in the industrial, transport and tertiary sectors; - Promoting the diffusions of tension switchers and other energy-saving appliances in the field of public lighting; - Developing the establishment of engine diagnostic plants in the transport sector; - Recovery and utilisation of petroleum associated gas.
	Actions in the field of industrial processes: - Reinforcing the national programme for environmental upgrading of industrial companies;

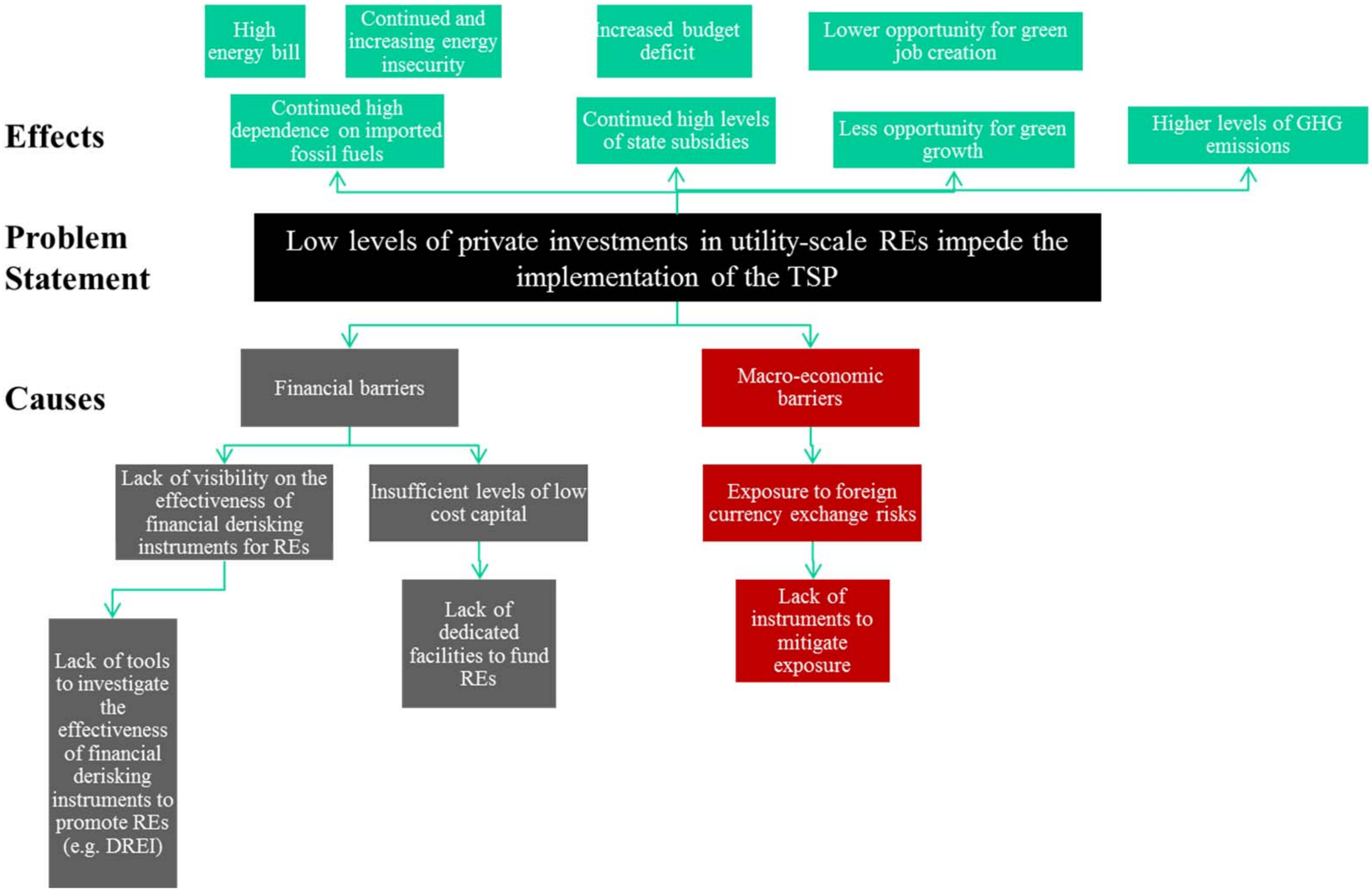
	- Reduction of the greenhouse gas emissions resulting from industrial processes, including N_2O emissions in the phosphate industry.
	Actions in the fields of afforestation/reforestation, agriculture and reduction of emissions resulting from deforestation and land degradation: - Increasing the forest cover rate from 12.8% in 2009 to 16% in 2020, by ensuring 250,000 hectares of forest and pastoral tree-planting at a rate of 27,000 hectares annually starting in 2012; - Increasing the percentage of natural reserves from the total area of forests from 17% in 2009 to 20% in 2014, by creating and rehabilitating 20 new natural reserves in forest areas; - Increasing the areas devoted to biological farming, to reach 500,000 hectares in 2014; - Upgrading farms according to international standards, and promoting the use of new water-saving techniques in irrigated perimeters to cover at least 200,000 hectares, compared to 120,000 hectares in 2009; - Reinforcing the programmes of brackish water desalinization and the reuse of treated wastewater, including in the framework of the implementation of the national strategy on water resources mobilisation by 2050, using the best energy-saving and water-saving technologies in aid in agriculture, fight in desertification and land protection, and forest and pastoral tree-planting.

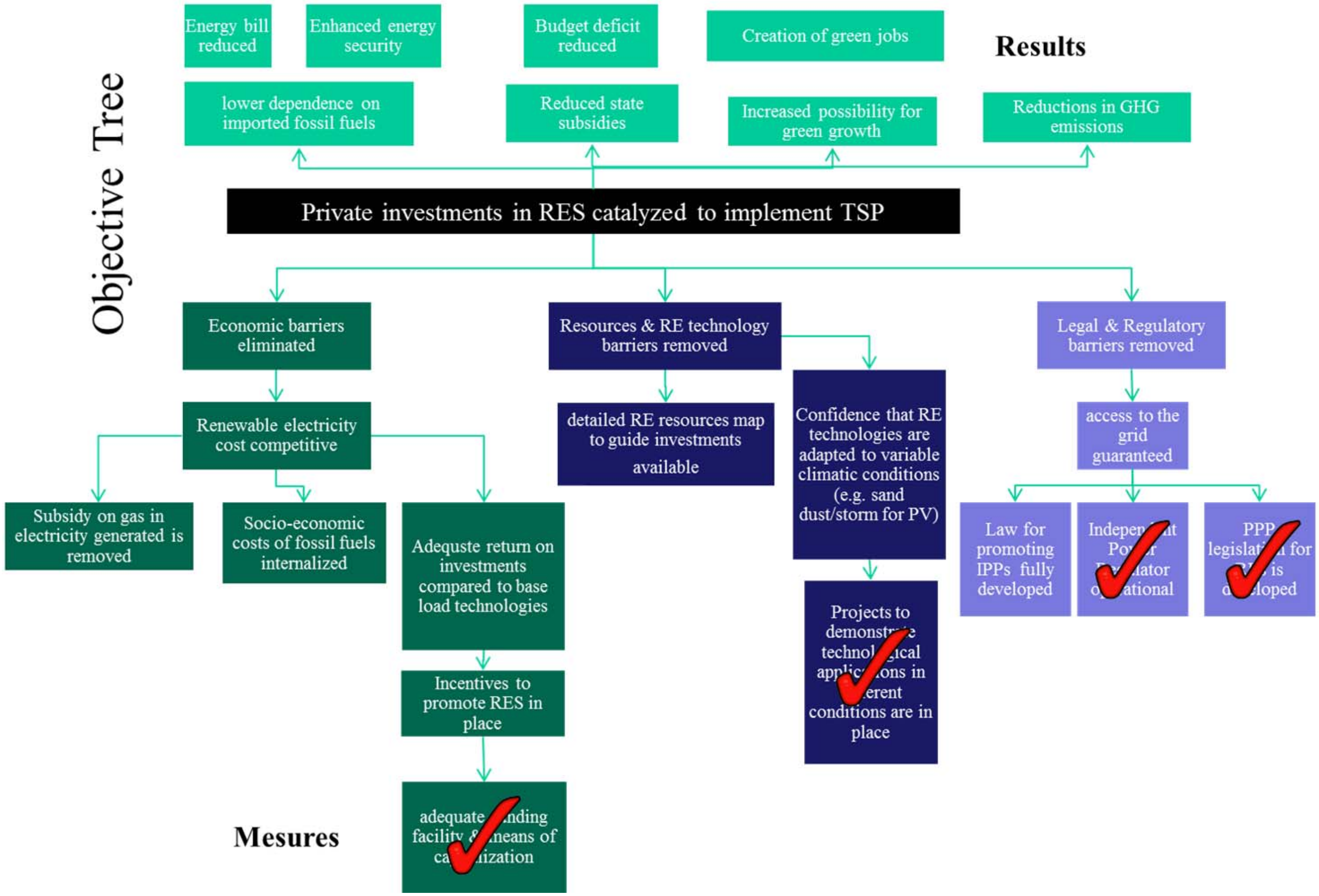
Annex 7.2. Logical Problem Analysis





Effects
High energy bill
Continued and increasing energy insecurity
Increased budget deficit
Lower opportunity for green job creation
Continued high dependence on imported fossil fuels
Continued high levels of state subsidies
Less opportunity for green growth
Higher levels of GHG emissions
Problem Statement
Low levels of private investments in utility-scale REs impede the implementation of the TSP
Causes
Technical barriers
Institutional barriers
Policy barriers
Level of penetration of RE of intermittent sources not clear
Lack of visibility for grid interconnection
Lack of high level cross-sectoral coordinating mechanism for the TSP
Inadequate institutional capacity to provide quality assurance for the sustainable development benefits of REs under TSP
Lack of adequate criteria to justify the sustainable development dividends of REs
Lack of visibility on the effectiveness of policy derisking instruments for REs
Lack of policy evidence on how the TSP supports sustainable development
Grid stability feasibility study not known for high penetration of REs (>20%)
Grid code not transparent
Absence of TSP management unit
Lack of geographical zoning for different types of REs for balancing intermittency
No meteorological forecasting in use to manage power generation and dispatching
No storage capacity available
Lack of tools to investigate the effectiveness of policy derisking instruments to promote REs (e.g. DREI)
Lack of human capacity to carryout such policy analysis
Lack of tools and methodologies to carryout cross-sectoral sustainable development analysis (e.g. system dynamics modeling)


Effects
High energy bill
Continued and increasing energy insecurity
Increased budget deficit
Lower opportunity for green job creation
Continued high dependence on imported fossil fuels
Continued high levels of state subsidies
Less opportunity for green growth
Higher levels of GHG emissions
Problem Statement
Low levels of private investments in utility-scale REs impede the implementation of the TSP
Causes
Financial barriers
Macro-economic barriers
Lack of visibility on the effectiveness of financial derisking instruments for REs
Insufficient levels of low cost capital
Exposure to foreign currency exchange risks
Lack of tools to investigate the effectiveness of financial derisking instruments to promote REs (e.g. DREI)
Lack of dedicated facilities to fund REs
Lack of instruments to mitigate exposure



Objective Tree
Results
Energy bill reduced
Enhanced energy security
Budget deficit reduced
Creation of green jobs
lower dependence on imported fossil fuels
Reduced state subsidies
Increased possibility for green growth
Reductions in GHG emissions
Private investments in RES catalyzed to implement TSP
Economic barriers eliminated
Resources & RE technology barriers removed
Legal & Regulatory barriers removed
Renewable electricity cost competitive
detailed RE resources map to guide investments available
Confidence that RE technologies are adapted to variable climatic conditions (e.g. sand dust/storm for PV)
access to the grid guaranteed
Subsidy on gas in electricity generated is removed
Socio-economic costs of fossil fuels internalized
Adequste return on investments compared to base load technologies
Law for promoting IPPs fully developed
Incentives to promote RES in place
Mesures

Annex 7.3. De-Risking Renewable Energy Investment (DREI) Analysis

This annex sets out the methodology, assumptions and data that have been used in performing the modelling described in this report.

The modelling closely follows the methodology set out in the UNDP De-Risking Renewable Energy Investment Report (2013) ("DREI report (2013)").[82] This annex is organised in line with the four stages of the DREI report's framework: the Risk Environment Stage (Stage 1), the Public Instrument Stage (Stage 2), the Levelised Cost Stage (Stage 3) and the Evaluation Stage (Stage 4). Wind energy and solar PV are separately addressed under each stage. Since the principal results for wind are shown in the main body of the Project Document, selected results are shown in Annex 7.3 for illustration. Further details are found in the accompanying Tunisia DREI Report (Waissbein, Deenapanray and Kelly, 2014)

In addition, the modelling uses the financial tool (in Microsoft Excel) created for the DREI report framework. The financial tool is denominated in 2014 Euros and covers a core period from January 1 2014 (approximating the present time) to December 31 2030 (Tunisia's 2030 TSP targets). Generation technologies may have asset lifetimes which extend beyond 2030, which is captured by the financial tool.

The DREI report and the financial tool are available for download at www.undp.org/DREI.

Risk Environment (Stage 1)

The data for the Risk Environment Stage come from three principal sources:

- UNDP's experience with, and analysis of, large-scale renewable energy, in particular the DREI report (2013).
- Multiple information interviews with relevant stakeholders and experts, such as Government officials (in particular ANME), international development practitioners and domestic renewable energy actors.
- 12 structured interviews with investors and developers in wind energy and solar PV in Tunisia and the best-in-class country (Germany).

In order to gather this data, the UNDP project development team made three field missions to Tunisia in the period between late 2013 and mid-2014.

Joint Treatment of Wind Energy and Solar PV

The Risk Environment Stage (Stage 1) is performed using one single, common set of assumptions and data for both large-scale wind energy and solar PV.

It is recognised that the risk profiles of large-scale wind energy and solar PV can differ, most notably for Resource & Technology risk. However, the results of the interviews with wind energy and solar PV investors made clear that these differences are minimal in the Tunisian context. As such, a single, common approach was adopted in order to bring simplicity to the analysis and to avoid multiple result sets.

Deriving a Multi-Stakeholder Barrier and Risk Table

The multi-stakeholder barrier and risk table for wind energy and solar PV is derived from the generic table for large-scale, renewable energy introduced in the DREI report (2013), (Section 2.1.1). It is composed of 9 risk categories and 20 underlying barriers. These risk categories, barriers and their definitions can be found in Table 5 in the body of the Project Document. The

[82] Waissbein et al. (2013).

stakeholder analysis for wind energy is given in Table 7.3.1. A similar mapping was carried out for PV (not shown).

Table 7.3.1. Public instrument table for utility-scale, on-grid wind energy deployment in Tunisia.

Key Stakeholder Group	Generic Barriers	Status in Tunisia	Risk Category	Risk Definition
Public sector (legislators, policymakers) - STEG (acts as regulator in the absence of an independnet regulator); Ministry of Industry (Renewable Energy Directorate); ANME (coordinates NAMAs in energy sector & promotes the TSP); Ministry of Finance (for subsidies)	- *Market outlook* : lack of or uncertainty regarding governmental (renewable) energy strategy and targets	Wind energy strategy and targets exist in the TSP.	**1. Power Market Risk**	Risk arising from limitations and uncertainties in the power market, and/or suboptimal regulations to address these limitations and promote renewable energy markets
	- *Market access and prices* : limitations related to energy market liberalization; uncertainty related to access, the competitive landscape and price outlook for renewable energy; limitations in design of standard PPAs and/or PPA tendering procedures	There is a quasi-monopoly in Tunisia concerning the generation, transmission and distribution of electricity. Although IPPs are allowed, there are to date only 2 IPPs. There is no standard PPA nor is there a transparent PPA tendering procedure. Concerning wind energy, only 30% of wind energy produced by an auto-producers can be sold to the grid and the price is at grid cost-parity. The new Energy Law will allow IPPs for the production of renewable energy but the modalities remain to be defined in Decrees. The installed capacity will be capped as follows:		
	- *Market distortions :* such as high fossil fuel subsidies	Investment in wind energy is made even more difficult since the cost of electricity is subsidized by up to 50%. Discussions with stakeholders have shown that it would be very difficult to institute cost-reflective electricity tariffs (or significant subsidy reform) under the current socio-political conditions prevailing in Tunisia.		

Pubic sector (administrators) - Ministry of Equipment, Land Planning and Sustainable Development; STEG; Ministry of Development and International Cooperation (develops and promotes the Investment Code); Foreign Investment Promotion Agency	- Labor-intensive, complex processes and long time-frames for obtaining licenses and permits (generation, EIAs, land title) for renewable energy projects	In the Ease of Doing Business, DB 2014, the lowest ranking of Tunisia (122) is in Dealing with Construction Permits. The overall EDB is 51 (http://www.doingbusiness.org/data/exploreeconomies/tunisia/).	**2. Permits Risk**	Risk arising from the public sector's inability to efficiently and transparently *administer* renewable energy-related licensing and permits.
	- High levels of corruption. No clear recourse mechanisms (http://www.tunisia-live.net/2013/07/11/corruption-rife-in-post-revolutionary-tunisia-according-to-survey/). Freedomhouse scores: accountability abd public voice score: 5.59; civil liberties score: 4.33; rule of law score: 3.05; anti-corruption and transparency score: 3.48 (http://www.freedomhouse.org/report/countries-crossroads/2012/tunisia)	Whether in the police force, tax revenue services, media, or other institutions, corruption remains ubiquitous in Tunisian society, according to a Transparency International poll of 1,000 Tunisians interviewed between September 2012 and March 2013. Corruption is also related to the ways in which political parties are funded and there is an absence of transparency.		
End-users, general public - Auto-producers; local communities	- Lack of awareness on renewable energy amongst consumers, end users and local residents	Main consumers will consist mainly of the public utility or for self-consumption by industries. UPC/Enerciel has mentioned during PIF mission that the industrial sector has little interest in REs because it is not part of their core business, and see RE production for self-consumption as a business risk. This risk can be reduced when the wind energy investor develops the project for an industry.	**3. Social Acceptance Risk**	Risks arising from lack of awareness and resistence to renewable energy in communities and end-users
	- Social and political resistance related to renewable energy NIMBY concerns, special interest groups	Proposed wind farms are either close to industrial sites or in semi-arid/arid areas that are not close to communities. During discussions with UPC/Enerciel in December 2013, Omar Bey mentioned that local		
Project developers (e.g. Enerciel and RESCOs (Mr Ghodhbani)), Supply chain (local supply of hardware non-existant); Ministry of Industry (Renewable Energy Directorate)	- *For resource assessment and supply:* inaccuracies in early-stage assessment of renewable energy resource; where applicable (e.g. bioenergy), uncertainties related to future supply and cost of resource	Wind resource assessment is carried out by the promoter and is therefore carried out using international benchmarks. The risk is only one of delay since wind resources measurements have to be carried out for at least one year.	**4. Resource & Technology Risk**	Risks arising from uncertainties regarding renewable energy resource and technology (resource assessment; construction and operational use; hardware purchase and manufacturing)
	- *For planning, construction, operations and maintenance:* suboptimal plant design; lack of local firms offering construction, maintenance services; lack of skilled and experienced local staff; uncertainties related to securing land and limitations in civic infrastructure (roads etc.)	There is a lack of local firms offering construction and maintenance services. There is also a lack of skilled and experienced local staff. **Civil infrastructure is not an issue at the moment but may become a issue with increasing penetration of renewables in uninhabited and semi-arid areas.**		
	- *For the purchase and, if applicable, local manufacture of hardware:* purchaser's lack of information on quality, reliability and cost of hardware; lack of local industrial presence and experience with hardware, including skilled and experienced local workforce	There is no local manufacturing of wind energy hardware in Tunisia, and there is certainly a lack of experienced local workforce. These make the cost of hardware higher than it would have been otherwise. Information on quality is not lacking especially in the case where the promoter like Enerciel has overseas partners (e.g. UPC).		

Key Stakeholder Group	Barriers		Risk Category	Risk Definition
Utility (transmission company/grid operator) - STEG	- *Grid code and management:* limited experience or suboptimal operational track-record of grid operator with intermittent sources (e.g., grid management and stability). Lack of standards for the integration of intermittent, renewable energy sources into the grid	Grid code exists and grid stability study has been carried out at STEG. UPC/Enerciel mentioned that the grid code is not publicly available and that it has been used by STEG to argue for a limited penetration of renewables in the national grid (and hence the relatively low installed capacity of wind (15 MW) and PV (10 MW)**. UPC/Enerciel would prefer to have an independent study of grid stability to be carried out.**	**5. Grid/ Transmission Risk**	Risks arising from limitations in grid management and transmission infrastructure in the particular country
	- *Transmission infrastructure:* inadequate or antiquated grid infrastructure, including lack of transmission lines from the renewable energy source to load centres; uncertainties for construction of new transmission infrastructure	Have not been able to get information about grid expansion and we can find out more during interviews. Nevertheless, it is certain that the costs of construction of sub-stations and any power lines to the sub-station for the interconnection to the grid are born by the private promoter.		
Utility (electricity purchaser) - STEG	- Limitations in the utility's (electricity purchaser) credit quality, corporate governance, management and operational track-record or outlook; unfavourable policies regarding utility's cost-recovery arrangements	Cost reflective prices of electricity is not practiced. The credit quality of the utility is reflected by the credit quality of the state since the government of Tunisia typically guarantees loans contracted by STEG. This is the case for renewable energy projects like Bizerte wind farm that was built using bilateral support from the Government of Spain, and the proposed PV plant at Tozeur that is expected to be funded through concesional loan from kfW. Discussions with non-STEG stakeholders reveal a poor level of corporate governance at STEG.	**6. Counterparty Risk**	Risks arising from the utility's poor credit quality and an IPP's reliance on payments

Investors (equity and debt) and priv ate promoters (e.g. Enerciel and others?)	- *Capital scarcity:* Limited availablity of local or international capital (equity/and or debt) for green energy infrastructure due to, for example: under-developed local financial sector; policy bias against investors in green energy	Discussions with UPC/Enerciel revealed that access to capital - both international and local - was not a problem. In fact, Omar Bey shared that there was an excess of liquidity in Tunisia and that seveal capital funds were interested to invest in renewable energy projects. It is in this context that he proposed to interview several local institutions. Raising capital on the local market is seen as an effective way to mitigate the risk against fluctuating and unfavourable currency exchange rates. Since private investments in renewables is underdeveloped, Enerciel has had to carry out advocacy next to local capital markets over the past years. Also, international institutions like the ERBD that has not previously invested in Tunisia are currently prospecting investing in renewable energy projects there. Omar Bey also mentioned access to capital from regional private equity/debt institutions. For pubic investment (e.g. STEG) there is access to concessional loans (e.g. KfW). However, the Ease of Doing Business, DB 2014, shows that the second lowest score for Tunisia is on Getting Credit (rank - 109) (http://www.doingbusiness.org/data/exploreeconomies/tunisia/).	**7. Financial Sector Risk**	Risks arising from general scarcity of investor capital (debt and equity) in the particular country, and investors' lack of information and track record on renewable energy
	- *Limited experience with renewable energy:* Lack of information, assessment skills and track-record for renewable energy projects amongst investor community; lack of network effects (investors, investment opportunities) found in established markets; lack of familiarity and skills with project finance structures	Not an issue based on interview carried out with UPC/Enerciel; STEG. Most probably because project developers have access to international expertise through either a technology provider or technology transfer through bilateral aid or because promoters have prior regional experiences with renewable energy development (e.g. UPC in Morocco).		
Project developers (e.g. Enerciel, STEG), utility (STEG)	- Uncertainty or impediments due to war, terrorism, and/or civil disturbance	There is uncertainty due to civil disturbance and ongoing social unrest.	**8. Political Risk**	Risks arising from country-specific governance and legal characteristics
	- Uncertainty due to high political instability; poor governance; poor rule of law and institutions	Civil disturbance and ongoing social unrest leads to political instability.		
	- Uncertainty or impediments due to government policy (currency restrictions, corporate taxes)	Corporate tax in Tunisia is 30%. There are also currency restrictions as per http://www.bct.gov.tn/bct/siteprod/english/relations/reglementation.jsp. However, a new Investment Code is in place that allows procurement of equipment for the environment (which covers all forms of energy) with incentives (e.g. VAT exempt).		

Project developers (e.g. Enerciel, STEG)	- Uncertainty due to volatile local currency; unfavorable currency exchange rate movements	This was identified as a main barrier by investors (e.g. Enerciel / Ghodhbani) as well as development partners such as GIZ. This is one of the reasons that push Enerciel to raise capital on the local market. A derisking instrument is to have a fund that can be used to guarantee against currency fluctuations.	**9. Macro-economic Risk**	Risks arising from the country's macroeconomic performance
	- Uncertainty around inflation, interest rate outlook due to an unstable macroeconomic environment	Inflation rate is around 6% and discussions with GIZ revealed that the real inflation rate could be higher (~12%). This then hampers access to long-term loans/debt even on the local market. The interest rate is around 4.7% and declining (marginally) to provide liquidity to banks (http://www.bct.gov.tn/bct/siteprod/english/actualites/evenement.jsp)		

Calculating the Impact of Risk Categories on Higher Financing Costs

The basis of the financing cost waterfalls produced in the modelling is structured, quantitative interviews undertaken with wind energy investors and developers. The interviews were performed on a confidential basis, and all data across interviews was aggregated. The interviews and processing of data followed the methodology described in Box 7.3.1 below, with investors scoring each risk category according to (i) the probability of occurrence of negative events, (ii) the level of financial impact from these events (should they occur) and (iii) the effectiveness of public instruments. Investors were also asked to provide estimates of their cost of equity, cost of debt, capital structure and loan tenors for typical RE projects in Tunisia. Interviewees were provided beforehand with an information document setting out key definitions and questions, and the typical interview took between 45 and 90 minutes.

Box 7.3.1. Methodology for quantifying the impact of risk categories on financing costs.

1. Interviews

Interviews were held with debt and equity investors active in wind energy and solar PV in Tunisia, as well as in a best-in-class country (Germany). The interviewees are asked to provide two types of data:

- Scores for the various risk categories identified in the barrier and risk framework. The scoring examines two aspects of barriers and risks, as set out in Figure 10 in the main body of the Project Document.
- The current cost of financing for making an investment today, which represents the end-point of the waterfall (or the starting point in case of the best-in-class country)

The interview questions to quantify the impact of risk categories on the cost of equity and debt were:

Q1 : How would you rate the probability that the events underlying the particular risk category occur?

Unlikely ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 Very Likely

Q2: How would you rate the financial impact of the events underlying the particular risk category, should the events occur?

Low Impact ○ 1 ○ 2 ○ 3 ○ 4 ○ 5 High Impact

2. Processing the data gathered

The data gathered from interviews is then processed. The methodology involves identifying the total difference in cost of equity or debt between the developing country (Tunisia) and the best-in-class developed country (Germany). This figure for the total difference reflects the total additional financing cost in the developing country.

The interview scores provided for each risk category address both components of risk: the *probability* of a negative event occurring above the probability of such event occurring in a best-in-class country and the *financial impact* of the event if such an event occurs. (See DREI Report (2013), Section 2.1.1). These two ratings are then multiplied to obtain a total score per risk category. These total risk scores are then used to pro-rate and apportion the total difference in cost of equity or debt.

A very simplified example to demonstrate the basic approach is shown below.

Cost of equity					
Developing County	16%				
Best-in-class Developed Country	11%				
Total Difference	5%				
Average investor risk scores for cost of equity					
	Incremental Score for Probability		Score for Impact		Total Risk Score
Risk Category #1	4	x	4	=	16
Risk Category #2	2	x	3	=	6
Risk Category #3	3	x	3	=	9
Total Across all Risks					**31**
Pro-rating risk scores across cost of equity					
Risk Category #1	16/31	x	5%	=	2.6%
Risk Category #2	6/31	x	5%	=	1.0%
Risk Category #3	9/31	x	5%	=	1.4%
					5.0%

In addition, the following key steps have been taken in calculating the financing cost waterfalls:

- In order to make interviews comparable, investors were asked to provide their scores while taking into account a list of eight key assumptions regarding wind energy or solar PV investment, as set out in Box 7.3.2 and Box 7.3.3, respectively. To maintain consistency, these assumptions have subsequently been used to shape the inputs in the LCOE calculation for wind energy in Stage 3.

Box 7.3.2. The eight investment assumptions for wind energy in Tunisia.

1. Provide scores based on the current investment environment in the country today

2. Assume you have the opportunity to invest in a 50-100 MW on-shore wind park

3. Assume 2-3 MW class wind turbines from a quality manufacturer with proven track record

4. Assume a build-own-operate (BOO) business model

5. Assume a comprehensive O&M contract

6. Assume that well-maintained transmission lines with free capacities are located within 10km of the project site

7. Assume an EPC construction sub-contract with high penalties for breach of contract

8. Assume a non-recourse project finance structure

Box 7.3.3. The eight investment assumptions for PV energy in Tunisia.

1. Provide scores based on the current investment environment in the country today

2. Assume you have the opportunity to invest in a 10-100 MW solar PV plant

3. Assume a high quality c-Si PV panel manufacturer with proven track record

4. Assume a build-own-operate (BOO) business model

5. Assume a comprehensive O&M contract

6. Assume that well-maintained transmission lines with free capacities are located within 10km of the project site

7. Assume an EPC construction sub-contract with high penalties for breach of contract

8. Assume a non-recourse project finance structure

- Equity investors in renewable energy typically have a greater exposure to development risks. The modelling exercise uses its full set of 9 risk categories for equity investors. The ‘permits risk’ and ‘financing risk’ categories are removed for debt investors, assuming that banks will have prerequisites, such as licences and having equity financing in place, before considering a funding request. As such, the modelling exercise uses 7 risk categories for debt investors.

- The modelling exercise selects Germany as the example of a best-in-class investment environment for wind energy and solar PV. In this way, Germany serves as the baseline – the left-most column of the financing cost waterfall.

Stage 2- Public Instruments

Public Instrument Table

The public instrument table for wind energy is derived from the generic table in the DREI report (Section 2.2.1). The modelling assumptions table is set out in full in Waissbein, Deenapanray and Kelly (2014).

In order to keep the scope of the modelling exercise manageable, the set of policy de-risking instruments for fossil-fuel subsidy reform (part of ‘power market risk’) are excluded from the modelling exercise.

Individual instruments in the public instrument table were then selected for Tunisia in a comprehensive manner: if the financing cost waterfall identified incremental financing costs for a particular risk category, then the matching public instrument in the table is deployed and modelled.

Policy De-risking Instruments

The following is a summary of the key approaches taken:

- *Public Cost.* Estimates for the public cost of policy de-risking instruments are calculated based on a bottom-up modelling approach. This follows the approach for costing set out in the DREI report (Section 2.2.2.). Each instrument has been modelled in terms of the costs of (i) full-time employees and (ii) external consultancies/services. Typically, full-time employees are modelled for the operation of an instrument (e.g. the full-time employees required to staff an energy regulator), and external consultancies/services are modelled for activities such as the design and evaluation of the instrument, as well as certain services such as publicity/awareness campaigns. Policy de-risking measures are modelled for up to the 17 year period from 2014 to 2030. Data have been obtained from analyses of Tunisian Government budgets, the budgets of development agency activities in Tunisia, as well as UNDP's in-house experience. See Waissbein, Deenapanray and Kelly (2014) for the cost estimates for policy de-risking instruments.

- *Effectiveness.* Estimates for the effectiveness of policy de-risking instruments in reducing financing costs are based on the structured interviews with investors, and then further adjusted to reflect UNDP's in-house experience. As certain policy de-risking instruments may take time to become maximally effective, a linear ("straight-line") approach to time effects is modelled over the 20-year target investment period. The assumptions for the final effectiveness (after 20 years) are shown in Table 7.3.2.

Table 7.3.2. The modelling assumptions for policy de-risking instruments' effectiveness.

Risk Category	Policy De-Risking Instrument	Effective-ness	Discount for timing effect	Comment
Energy Market Risk	Long-term targets; regulatory framework; standardised PPA; independent regulator	75%	50%	Interview responses: high effectiveness
Permits Risk	Streamlined process for permits; Establishment of a dedicated one-stop shop for RE permits; contract enforcement and recourse mechanisms	50%	50%	Interview responses: moderate effectiveness.
Social Acceptance Risk	Awareness-raising campaigns targeting general public; pilot models for community involvement at project sites	50%	50%	Interview responses: moderate effectiveness.
Resource & Technology Risk	Resource assessment; technology and O&M assistance	25%	50%	Interview responses: moderate/low effectiveness.
Grid/ Transmission Risk	Grid code; grid management studies	50%	50%	Interview responses: moderate effectiveness.
Counterparty Risk	Strengthening utility's management & operational performance for existing operations	50%	50%	Interview responses: high effectiveness.
Financial Sector Risk	Financial sector reform; strengthening investors' familiarity and assessment capacity for renewable energy	25%	50%	Interview responses: moderate/low effectiveness.

Financial De-risking Instruments

The modelling assumptions for financial de-risking instruments are informed by UNDP's in-house experience, interviews with representatives from international financial institutions and interviews with project developers.

Empirically, the selection, pricing and costing of financial de-risking instruments for a particular renewable energy investment is determined on a case-by-case basis, and reflects the particular risk-reward characteristics of that investment. The modelling exercise assumptions instead cover the aggregate investments for Tunisia's 2030 wind target and represent a simplified, but plausible, formulation for the selection and pricing of financial de-risking instruments. The following is a summary of the key assumptions used.

- *Cost.* Estimates of public cost of financial de-risking instruments are set out in Table 7.3.3.

Table 7.3.3. The modelling assumptions on costing of financial de-risking instruments.

Risk Category	Financial de-risking instrument	Description of modelling assumptions
Grid/ Transmission Risk	Take-or-Pay Clause in PPA	• Assumes 100% of IPP's lost revenues due to grid or transmission failures are covered by take-or-pay clause • [Applies historical rates for black-/brown-outs in Tunisia]
Counterparty Risk	Government Guarantee	• Assumes Tunisia Ministry of Economics and Finance provides a "Letter of Support" for each PPA entered into between IPP and STEG • Simplifying assumption that no cost attributed to the Ministry of Finance's letter
Financial Sector Risk	Public Loan	• Assumes illustrative, concessional USD/EUR loans of 4% and 20-year tenor from multilateral development banks to cover 50% of total debt needs. This is to address possible lack of capital in Tunisian financial markets. • Public cost: o Assumes public cost is 100% of the loan amount o Assumes 3.5x paid-in-capital multiplier, recognising that multilateral development banks can issue debt on capital markets, thereby leveraging their paid-in capital (UN 2010)
Currency/ Macroecono mic Risk	Partial Indexing	• Assumes illustrative mechanism whereby IPPs can request partial indexing of Tunisian Dinar (TND)-denominated PPA tariffs to EUR. • Assumes illustrative 50% of TND denominated PPA tariff is indexed. • Assumes 4% annual depreciation of TND vs EUR, based on historical currency exchange rates.

- *Effectiveness.* Estimates for the effectiveness of financial de-risking instruments in reducing financing costs are based on the structured interviews with investors, and then further adjusted to reflect UNDP's in-house experience. The figures for effectiveness have full and immediate impact once the instrument is implemented (i.e. no timing discount). The assumptions for effectiveness are shown in Table 7.3.4.

Table 7.3.4. The modelling assumptions for financial de-risking instruments' effectiveness.

Risk Category	Financial De-risking Instrument	Effective-ness	Discount for timing effect	Comment

Grid / Transmission Risk	Take-or-Pay Clause in PPA	25%	0%	Interview responses: high effectiveness. However, residual risks remain.
Counterparty Risk	Government Guarantee	25%	0%	Interview responses: moderate effectiveness.
Financial Sector Risk	Public Loan	0% [Impact via concessional interest rates]	0%	Interview responses: low effectiveness.
Currency / Macroecono mic Risk	Partial Indexing	50%	0%	Interview responses: high effectiveness. However, residual risks remain.

Stage 3- Levelised Costs

Levelised Cost of Electricity (LCOE) Calculation

The DREI report's financial tool is used for the LCOE calculations. The financial tool is based on the equity-share based approach to LCOE, which is also used by ECN and NREL (IEA, 2011; NREL, 2011). Box 7.3.4 sets out the LCOE formula used. In this approach, a capital structure (debt and equity) is determined for the investment, and the cost of equity is used to discount the energy cash-flows.

Box 7.3.4. The modelling exercise's LCOE formula.

$$\frac{\%\,\mathit{Equity\ Capital} * \mathit{Total\ Investment} + \sum_{t=1}^{T} \frac{(\mathit{O\&M\ Expense})_t + (\mathit{Debt\ Financing\ Costs})_t - \mathit{Tax\ Rate} * (\mathit{Interest\ Expense}_t + \mathit{Depreciation}_t + \mathit{O\&M\ Expense}_t)}{(1 + \mathit{Cost\ of\ Equity})^t}}{\sum_{t=1}^{T} \frac{\mathit{Electricity\ Production}_t * (1 - \mathit{Tax\ Rate})}{(1 + \mathit{Cost\ of\ Equity})^t}}$$

Where,

% Equity Capital = portion of the investment funded by equity investors

O&M Expense = operating & maintenance expenses

Debt Financing Costs = interest & principal payments on debt

Depreciation = depreciation on fixed assets

Cost of Equity = after-tax target equity IRR

Tax-deductible, linear depreciation of 95% of fixed assets over the lifetime of investment is used. The standard corporate tax rate for Tunisia of 30% was used (Deloitte, 2012). No tax credits, or other tax treatment, are assumed.

Baseline Energy Mix Levelised Costs and Emissions

The modelling makes a number of important methodological choices and assumptions regarding the baseline. The key steps in the approach taken are set out here:

- A marginal baseline (build margin) approach is used on the basis that Tunisia is characterised by rapidly increasing energy demand and, as such, new wind energy and solar PV installations will likely not replace existing capacity.

- In addition, a private-sector perspective to baseline investment is similarly used. This reflects the fact that Tunisia is seeking to attract private sector investment irrespective of energy technology, and allows for the comparability of the marginal baseline LCOE with the wind energy LCOE.

- To date in Tunisia, historic private sector IPP investment has been in combined cycle gas turbine technology (CCGT), with two such IPPs to date. As such, the modelling exercise uses combined cycle gas turbine technology as the marginal baseline technology.

- The modelling assumptions for CCGT are shown below in Table 7.3.5.

Table 7.3.5. The modelling assumptions for the baseline energy technology, combined cycle gas turbine (CCGT).

Technology Item	Assumption	Source
Initial investment cost (EUR/MW_{el})	700,000	Schmidt *et al* (2013)[83]
O&M cost excl. fuel (EUR/MW_{el})	27,100	Schmidt *et al* (2013)
Life Span (years)	25	Schmidt *et al* (2013)
System Efficiency	52.7%	ANME (2013)[84]
Capacity Factor	79.9%	ANME (2013)
Emissions Factor	0.448 tCO_2e/MWh	CDM PDD

- Private-sector financing costs are used to calculate the LCOE of the marginal baseline mix. The cost of equity and cost of debt used for CCGT were those obtained for wind and solar energy (BAU scenario) in Tunisia, discounted by 15% to account for the existing track record of CCGT compared with wind energy. Loan tenors were taken as half the lifetime of the particular generation technology.

- Current fuel prices were taken as the starting point and then evolved over time using the IEA medium price projections (WEO, 2013). The current prices were taken from STEG's transfer prices for IPPs (http://www.steg.com.tn/fr/clients_ind/tarifs_hp.html) as of May 2014. This generates a price of EUR 20.27/MWh_{th} in 2014, with a linear increase over the 25-year lifetime of the plant to EUR 34.74/MWh_{th} in 2039. Recently, there have been efforts by STEG to reduce subsidies on fuel costs; however, it is not clear to what degree these STEG transfer prices are subsidised. It is noted that the current STEG transfer price is close to the current European spot price. The issue of subsidies can be an area of further research in future applications of this methodology.

- Emissions data for CCGT is taken from the latest registered UNFCCC CDM PDD in Tunisia.[85]

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[83] Schmidt T.S., Blum N.U., Sryantoro R. (2013): "Attracting private investments into rural electrification - a case study on renewable energy based village grids in Indonesia", *Energy for Sustainable Development* 17 (2013), 581–595.

[84] 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.

Wind Energy Levelised Costs

The assumptions for the wind energy LCOE calculation are set out in Table 7.3.6.

Table 7.3.6. The modelling assumptions on technology specifications for wind energy.

Technology Item	Assumption	Source
2030 wind energy installed capacity	1,404 MW	Tunisian Solar Plan (2013) Note: The Plan's 1,755 MW figure is adjusted to reflect 80% private-sector investment
Wind energy capacity factor	30.0%	Authors. Tunisian Solar Plan (2013) assumes 28.2%
Turbine size	2-3 MW class	Authors
Park size	50-100 MW	Authors
Core investment costs, including balance of plant costs (civil works, transformers) 2014 Cost	1,307.692 EUR/MW	Tunisian project developers
Annual O&M costs At start of operation Annual increase	13,836 EUR/MW 2%	Tunisian project developers
Lifetime	20 years	Authors

Solar PV Levelised Costs

The assumptions for the solar PV LCOE calculation are set out in Table 7.3.7.

Table 7.3.7. The modelling assumptions on technology specifications for solar PV.

Technology Item	Assumption	Source
2030 wind energy installed capacity	736 MW	Tunisian Solar Plan (2013) Note: The Plan's 1,510 MW figure is adjusted to reflect (i) distributed solar PV of 590 MW by 2030 and (ii) 80% private-sector investment
Wind energy capacity factor	21.8%	Authors Tunisian Solar Plan (2013) assumes 28.2%
Solar PV technology	C-Si	Authors
Park size	10-100 MW	Authors
Core investment costs, including balance of plant costs (civil works, transformers) 2014 Cost	1,253.846 EUR/MW	Bloomberg New Energy Finance (2014)[86]
Annual O&M costs	19,231 EUR/MW	Tunisian project developers

[85] Please see 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.

[86] Bloomberg New Energy Finance. (2014), *Global Trends in New Energy Investment 2014*. Frankfurt School –UNEP Centre/BNEF: Frankfurt - http://fs-unep-centre.org/sites/default/files/attachments/14008nef_visual_12_key_findings.pdf - accessed 16 July 2014.

At start of operation Annual increase	2%	
Lifetime	20 years	Authors

The LCOE for PV is shown in Figure 7.3.1. The LCOE of electricity generated from PV is €9.9 cents/kWh in the business-as-usual (i.e. prevailing barriers and risks) scenario. Applying the public de-risking instruments reduces the LCOE of electricity generated from PV to €7.7 cents/kWh. In the BAU scenario (i.e. in the absence of de-risking instruments), €3.9 cents/kWh must be provided in compensation to an independent power producer (IPP), either in the form of a feed-in tariff (FiT) or a preferential tariff in a Power Purchase Agreement (PPA), so as to make PV-generated electricity cost-competitive relative to gas-generated electricity.

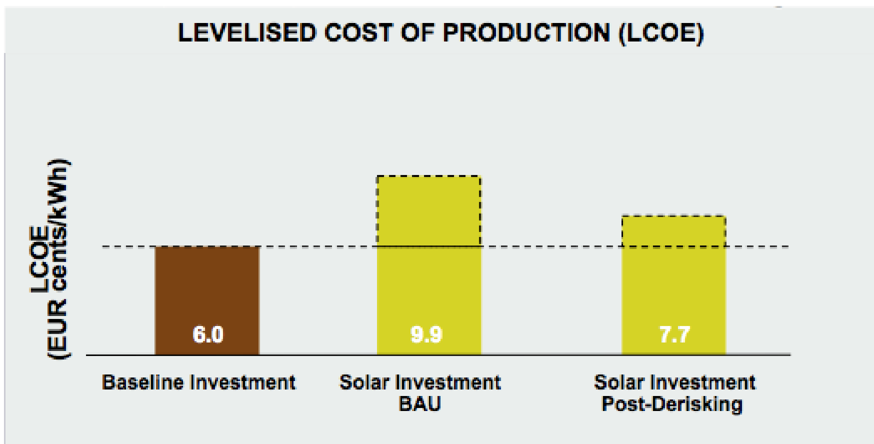

Figure 7.3.1. LCOE of PV electricity before and after de-risking.

Stage 4 - Evaluation

This assesses the selected public de-risking instruments mix using four performance metrics, as well as through the use of sensitivity analyses. The four metrics are: (i) investment leverage ratio, (ii) savings leverage ratio, (iii) end-user affordability, and (iv) carbon abatement.

The results for PV are shown in Figure 7.3.2. For an installed PV capacity of 0.7 MW (capital investment = €935 million), the total cost of compensation (to make PV competitive with CCGT electricity) is estimated as €635 million. With de-risking instruments in place, however, this compensation can be reduced to €421 million. The costs of putting in place the required policy and financial de-risking instruments are €4 million and €141 million, respectively – i.e. a total of €145 million (Figure 7.3.2(a)). Therefore, through the use of de-risking instruments, the total cost for achieving the same penetration of wind energy would be only €421 million. This gives a leverage ratio of 2.2 for de-risking instruments: i.e. for every €1 of public money spent on compensatory payments (a FiT or preferential PPA tariff) and de-risking instruments, €2.2 of private-sector investment can be mobilised for wind energy. This compares favourably with the scenario in which compensatory payments are offered but unaccompanied by de-risking measures: in this scenario, the leverage ratio is just 1.5.

Figure 7.3.2(b) shows that the public instruments result in savings of €275 million, corresponding to a savings ratio of 2.5. Alternatively, end-users experience a net reduction in the affordability of electricity of 22.5% - i.e. a reduction from €9.9 cents/kWh to €7.7 cents/kWh due to the implementation of the selected package of public instruments as shown in Figure 7.3.2(c).

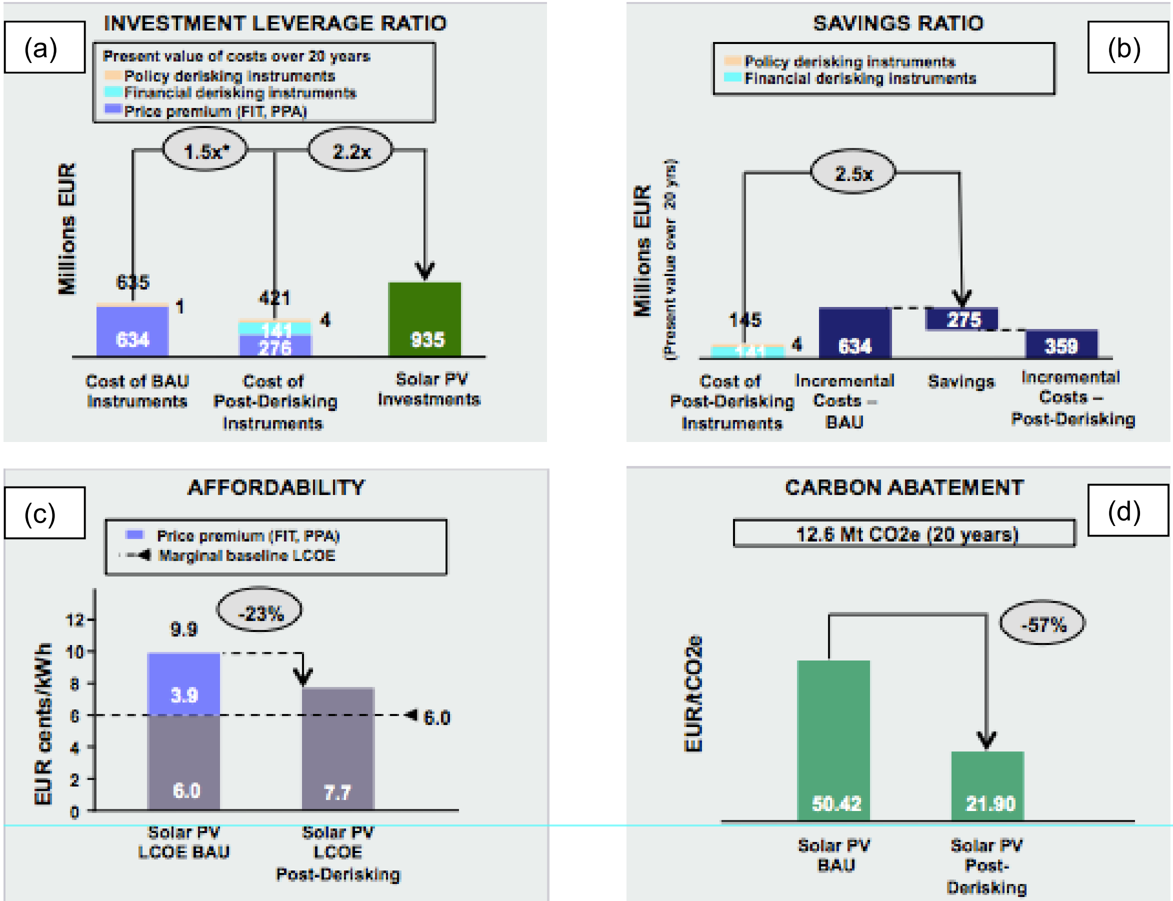

Figure 7.3.2. Performance metric for the selected package of public de-risking instruments in promoting 0.7 GW of PV investment in Tunisia: (a) investment leverage ratio; (b) savings ratio; (c) affordability; and (d) carbon abatement.

*In the BAU scenario, the full 2030 investment target may not be met.

Figure 7.3.2(d) shows that the GHG abatement cost is 21.90 €/tCO_{2e} with de-risking instruments applied, whereas it is more than double (50.42 €/tCO_{2e}) when full compensation is required to promote PV.

Sensitivity Analysis

The modelling performs a number of sensitivities for each of wind energy and solar PV. For each sensitivity, one key input factor is selected and varied by +/- 10%. The three sensitivities are:

- *Capacity factor (wind energy)*. This sensitivity illustrates variations in wind speed, site selection and turbine performance from the base-case assumptions in the modelling exercise. This is also closely related to issues such as social acceptance and transmission lines, which may prevent the best sites from being accessed.

- *Fuel costs (wind energy; solar PV)*. This sensitivity increases or decreases the starting unsubsidised fuel costs. The change is then kept constant over time. This sensitivity illustrates the impact of variations in the marginal baseline LCOE, one of the key outputs in each country's case-study.

- *Grid integration costs (wind energy and PV)*. This analysis investigates the additional costs associated with the need for back-up power supply due to the variability of wind and solar insolation.

The results of the sensitivity analysis are shown in the accompanying Tunisia DREI Report (Waissbein, Deenapanray and Kelly, 2014).

Annex 7.4. UNDP Environmental and Social Safeguards

UNDP Environmental and Social Screening for NAMA Support for the Tunisian Solar Plan

QUESTION 1:

Has a combined environmental and social assessment/review that covers the proposed project already been completed by implementing partners or donor(s)?

Select answer below and follow instructions:

☒ →NO: Continue to Question 2 (do not fill out Table 1.1)

☐→YES: No further environmental and social review is required if the existing documentation meets UNDP's quality assurance standards, and environmental and social management recommendations are integrated into the project. Therefore, you should undertake the following steps to complete the screening process:

1. Use Table 1.1 below to assess existing documentation. (It is recommended that this assessment be undertaken jointly by the Project Developer and other relevant Focal Points in the office or Bureau).
2. Ensure that the Project Document incorporates the recommendations made in the implementing partner's environmental and social review.
3. Summarize the relevant information contained in the implementing partner's environmental and social review in Annex A.2 of this Screening Template, selecting Category 1.
4. Submit Annex A to the PAC, along with other relevant documentation.

Note: Further guidance on the use of national systems for environmental and social assessment can be found in the UNDP ESSP Annex B.

TABLE 1.1: CHECKLIST FOR APPRAISING QUALITY ASSURANCE OF EXISTING ENVIRONMENTAL AND SOCIAL ASSESSMENT	**Yes/No**
1. Does the assessment/review meet its terms of reference, both procedurally and substantively?	
2. Does the assessment/review provide a satisfactory assessment of the proposed project?	
3. Does the assessment/review contain the information required for decision-making?	
4. Does the assessment/review describe specific environmental and social management measures (e.g. mitigation, monitoring, advocacy, and capacity development measures)?	
5. Does the assessment/review identify capacity needs of the institutions responsible for implementing environmental and social management issues?	
6. Was the assessment/review developed through a consultative process with strong stakeholder engagement, including the view of men and women?	
7. Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?	
Table 1.1 (continued) For any "no" answers, describe below how the issue has been or will	

be resolved (e.g. amendments made or supplemental review conducted).

QUESTION 2:

Do all outputs and activities described in the Project Document fall within the following categories?

☐Procurement (in which case UNDP's Procurement Ethics and Environmental Procurement Guide need to be complied with)

☐Report preparation

☐Training

☐Event/workshop/meeting/conference (refer to Green Meeting Guide)

☐ Communication and dissemination of results

Select answer below and follow instructions:

☒**NO** → Continue to Question 3

☐**YES** → No further environmental and social review required. Complete Annex A.2, selecting Category 1, and submit the completed template (Annex A) to the PAC.

QUESTION 3:

Does the proposed project include activities and outputs that support *upstream* planning processes that potentially pose environmental and social impacts or are vulnerable to environmental and social change (refer to Table 3.1 for examples)? (Note that *upstream* planning processes can occur at global, regional, national, local and sectoral levels) Select the appropriate answer and follow instructions: ☐ **NO** → Continue to Question 4. ☒ **YES** →Conduct the following steps to complete the screening process: 1. Adjust the project design as needed to incorporate UNDP support to the country(ies), to ensure that environmental and social issues are appropriately considered during the upstream planning process. Refer to Section 7 of this Guidance for elaboration of environmental and social mainstreaming services, tools, guidance and approaches that may be used. 2. Summarize environmental and social mainstreaming support in Annex A.2, Section C of the Screening Template and select "Category 2". 3. If the proposed project ONLY includes upstream planning processes then screening is complete, and you should submit the completed Environmental and Social Screening Template (Annex A) to the PAC. If downstream implementation activities are also included in the project then continue to Question 4.

TABLE 3. 1 EXAMPLES OF UPSTREAM PLANNING PROCESSES WITH POTENTIAL DOWNSTREAM ENVIRONMENTAL AND SOCIAL IMPACTS	Check appropriate box(es) below
1. Support for the elaboration or revision of **global- level** strategies, policies, plans, and programmes. *For example, capacity development and support related to international negotiations and agreements. Other examples might include a global water governance project or a global MDG project.*	No
2. Support for the elaboration or revision of **regional-level** strategies, policies and plans, and programmes. *For example, capacity development and support related to transboundary programmes and planning (river basin management, migration, international waters, energy development and access, climate change adaptation etc.).*	No
3. Support for the elaboration or revision of **national-level** strategies, policies, plans and programmes. *For example, capacity development and support related to national development policies, plans, strategies and budgets, MDG-based plans and strategies (e.g. PRS/PRSPs, NAMAs), sector plans.*	Yes
4. Support for the elaboration or revision of **sub-national/local-level** strategies, polices, plans and programmes. *For example, capacity development and support for district and local level development plans and regulatory frameworks, urban plans, land use development plans, sector plans, provincial development plans, provision of services, investment funds, technical guidelines and methods, stakeholder engagement.*	Yes

QUESTION 4:

Does the proposed project include the implementation of *downstream* activities that potentially pose environmental and social impacts or are vulnerable to environmental and social change?

To answer this question, you should first complete Table 4.1 by selecting appropriate answers. If you answer "No" or "Not Applicable" to all questions in Table 4.1 then the answer to Question 4 is "NO." If you answer "Yes" to any questions in Table 4.1 (even one "Yes" can indicated a significant issue that needs to be addressed through further review and management) then the answer to Question 4 is "YES":

☐ **NO** → No further environmental and social review and management required for downstream activities. Complete Annex A.2 by selecting "Category 1", and submit the Environmental and Social Screening Template to the PAC.

☒ **YES** → Conduct the following steps to complete the screening process:

1. Consult Section 8 of this Guidance, to determine the extent of further environmental and social review and management that might be required for the project.
2. Revise the Project Document to incorporate environmental and social management measures. Where further environmental and social review and management activity cannot be undertaken prior to the PAC, a plan for undertaking such review and management activity within an acceptable period of time, post-PAC approval (e.g. as the first phase of the project) should be outlined in Annex A.2.
3. Select "Category 3" in Annex A.2, and submit the completed Environmental and Social Screening Template (Annex A) and relevant documentation to the PAC.

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT

1. Biodiversity and Natural Resources	**Answer** (Yes/No/ Not Applicable)
1.1 Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat?	Unlikely – but future TSP RE investment projects will be assessed accordingly
1.2 Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?	No
1.3 Would the proposed project pose a risk of introducing invasive alien species?	No
1.4 Does the project involve natural forest harvesting or plantation development without an independent forest certification system for sustainable forest management (*e.g. PEFC, the Forest Stewardship Council certification systems, or processes established or accepted by the relevant National Environmental Authority*)?	No
1.5 Does the project involve the production and harvesting of fish populations or other aquatic species without an accepted system of	No

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT	
independent certification to ensure sustainability (*e.g. the Marine Stewardship Council certification system, or certifications, standards, or processes established or accepted by the relevant National Environmental Authority*)?	
1.6 Does the project involve significant extraction, diversion or containment of surface or ground water? *For example, construction of dams, reservoirs, river basin developments, groundwater extraction.*	No
1.7 Does the project pose a risk of degrading soils?	Unlikely – but future TSP RE investment projects will be assessed accordingly
2. Pollution	**Answer** (Yes/No/ Not Applicable)
2.1 Would the proposed project result in the release of pollutants to the environment due to routine or non-routine circumstances with the potential for adverse local, regional, and transboundary impacts?	Unlikely – but future TSP RE investment projects will be assessed accordingly
2.2 Would the proposed project result in the generation of waste that cannot be recovered, reused, or disposed of in an environmentally and socially sound manner?	Unlikely – but future TSP RE investment projects will be assessed accordingly
2.3 Will the propose project involve the manufacture, trade, release, and/or use of chemicals and hazardous materials subject to international action bans or phase-outs? *For example, DDT, PCBs and other chemicals listed in international conventions such as the Stockholm Convention on Persistent Organic Pollutants, or the Montreal Protocol.*	No
2.4 Is there a potential for the release, in the environment, of hazardous materials resulting from their production, transportation, handling, storage and use for project activities?	Unlikely – but future TSP RE investment projects will be assessed accordingly
2.5 Will the proposed project involve the application of pesticides that have a known negative effect on the environment or human health?	No
3. Climate Change	
3.1 Will the proposed project result in significant[87] greenhouse gas emissions? *Annex E provides additional guidance for answering this question.*	No – the reverse: significant GHG emission reductions

[87] Significant corresponds to CO_2 emissions greater than 100,000 tons per year (from both direct and indirect sources). Annex E provides additional guidance on calculating potential amounts of CO_2 emissions.

TABLE 4.1: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT	
3.2 Is the proposed project likely to directly or indirectly increase environmental and social vulnerability to climate change now or in the future (also known as maladaptive practices)? You can refer to the additional guidance in Annex C to help you answer this question. *For example, a project that would involve indirectly removing mangroves from coastal zones or encouraging land use plans that would suggest building houses on floodplains could increase the surrounding population's vulnerability to climate change, specifically flooding.*	No
4. Social Equity and Equality	**Answer** (Yes/No/ Not Applicable)
4.1 Would the proposed project have environmental and social impacts that could affect indigenous people or other vulnerable groups?	No
4.2 Is the project likely to significantly impact gender equality and women's empowerment[88]?	Marginal positive impacts
4.3 Is the proposed project likely to directly or indirectly increase social inequalities now or in the future?	No
4.4 Will the proposed project have variable impacts on women and men, different ethnic groups, social classes?	No
4.5 Have there been challenges in engaging women and other certain key groups of stakeholders in the project design process?	No
4.6 Will the project have specific human rights implications for vulnerable groups?	No
5. Demographics	
5.1 Is the project likely to result in a substantial influx of people into the affected community(ies)?	Unlikely – but future TSP RE investment projects will be assessed accordingly
5.2 Would the proposed project result in substantial voluntary or involuntary resettlement of populations? *For example, projects with environmental and social benefits (e.g. protected areas, climate change adaptation) that impact human settlements, and certain disadvantaged groups within these settlements in particular.*	Unlikely – but future TSP RE investment projects will be assessed accordingly
5.3 Would the proposed project lead to significant population density increase which could affect the environmental and social sustainability of the project? *For example, a project aiming at financing tourism infrastructure in a specific area (e.g. coastal zone, mountain) could lead to significant population density increase which could have serious environmental and social impacts (e.g. destruction of the area's ecology, noise pollution, waste management problems, greater work burden on women).*	Unlikely – but future TSP RE investment projects will be assessed accordingly
1. Culture	

[88] Women are often more vulnerable than men to environmental degradation and resource scarcity. They typically have weaker and insecure rights to the resources they manage (especially land), and spend longer hours on collection of water, firewood, etc. (OECD, 2006). Women are also more often excluded from other social, economic, and political development processes.

<u>TABLE 4.1</u>: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT	
6.1 Is the project likely to significantly affect the cultural traditions of affected communities, including gender-based roles?	No
6.2 Will the proposed project result in physical interventions (during construction or implementation) that would affect areas that have known physical or cultural significance to indigenous groups and other communities with settled recognized cultural claims?	No
6.3 Would the proposed project produce a physical "splintering" of a community? *For example, through the construction of a road, powerline, or dam that divides a community.*	No
2. Health and Safety	
7.1 Would the proposed project be susceptible to or lead to increased vulnerability to earthquakes, subsidence, landslides, erosion, flooding or extreme climatic conditions? *For example, development projects located within a floodplain or landslide prone area.*	Unlikely – but future TSP RE investment projects will be assessed accordingly
7.2 Will the project result in increased health risks as a result of a change in living and working conditions? In particular, will it have the potential to lead to an increase in HIV/AIDS infection?	Unlikely – but future TSP RE investment projects will be assessed accordingly
7.3 Will the proposed project require additional health services including testing?	Unlikely – but future TSP RE investment projects will be assessed accordingly
3. Socio-Economics	
8.1 Is the proposed project likely to have impacts that could affect women's and men's ability to use, develop and protect natural resources and other natural capital assets? *For example, activities that could lead to natural resources degradation or depletion in communities who depend on these resources for their development, livelihoods, and well-being?*	Unlikely – but future TSP RE investment projects will be assessed accordingly
8.2 Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?	No
8.3 Is the proposed project likely to negatively affect the income levels or employment opportunities of vulnerable groups?	No
9. Cumulative and/or Secondary Impacts	**Answer** (Yes/No/ Not Applicable)
9.1 Is the proposed project location subject to currently approved land use plans (e.g. roads, settlements) which could affect the environmental and social sustainability of the project? *For example, future plans for urban growth, industrial development, transportation infrastructure, etc.*	Unlikely – but future TSP RE investment projects will be assessed accordingly
9.2 Would the proposed project result in secondary or consequential development which could lead to environmental and social effects, or would it have potential to generate cumulative impacts with other known	Unlikely – but future TSP RE investment projects will be

<u>TABLE 4.1</u>: ADDITIONAL SCREENING QUESTIONS TO DETERMINE THE NEED AND POSSIBLE EXTENT OF FURTHER ENVIRONMENTAL AND SOCIAL REVIEW AND MANAGEMENT	
existing or planned activities in the area? *For example, a new road through forested land will generate direct environmental and social impacts through the cutting of forest and earthworks associated with construction and potential relocation of inhabitants. These are direct impacts. In addition, however, the new road would likely also bring new commercial and domestic development (houses, shops, businesses). In turn, these will generate indirect impacts. (Sometimes these are termed "secondary" or "consequential" impacts). Or if there are similar developments planned in the same forested area then cumulative impacts need to be considered.*	assessed accordingly

ANNEX A.2: ENVIRONMENTAL AND SOCIAL SCREENING SUMMARY
(to be filled in after Annex A.1 has been completed)

Name of Proposed Project: NAMA Support for the Tunisian Solar Plan

A. Environmental and Social Screening Outcome

Select from the following:

☐ Category 1. No further action is needed

☒ Category 2. Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

☐ Category 3. Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:

☐ Category 3a: Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b).

☐ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate.

B. Environmental and Social Issues (for projects requiring further environmental and social review and management)

In this section, you should list the key potential environmental and social issues raised by this project. This might include both environmental and social opportunities that could be seized on to strengthen the project, as well as risks that need to be managed. You should use the answers you provided in Table 4.1 as the basis for this summary, as well as any further review and management that is conducted.

Two aspects of the UNDP-implemented, GEF-financed project should be considered:

- The two baseline investment projects – the PV plant at Tozeur and the wind farm at Gabes – that form definite elements of the UNDP-implemented, GEF-financed project.
- Subsequent renewable energy investment projects that may be implemented under the Tunisian Solar Plan, having been facilitated by direct or indirect assistance provided by the UNDP-implemented, GEF-financed project. The locations and details of these future investment projects are not yet known.

To summarise the results of this Environment & Social Screening:

- The two baseline investment projects – the PV plant at Tozeur and the wind farm at Gabes – have been subjected to rigorous, internationally-recognised EIA procedures.
- The potential future investment projects have not been subjected to EIA procedures (since they have not yet been initiated), but the UNDP-implemented, GEF-financed project will put in

place environmental and social safeguard guidelines to ensure that such projects are fully assessed prior to construction/operation.

The World Bank standards and the Sustainable Development safeguards of KfW have ensured that the 10 MW PV project proposed at Tozeur meets the Environmental and Social Safeguards of UNDP. Similarly, Environmental and Social Impact Studies have been completed for the wind energy project at Gabes using the World Bank and European Union standards for environmental and social safeguards. Supplementary details are provided below for the two projects.

The screening processes have revealed that the national legislation has two weaknesses that can be overcome by adopting the World Bank standard for EIA and community engagement. These weaknesses are: (1) current legislation does not require an Environmental Impact Assessment (EIA) permit for power plants with an installed capacity of less than 300 MW; and (2) the stakeholder engagement process is not extensive.

C. Next Steps (for projects requiring further environmental and social review and management):

In this section, you should summarize actions that will be taken to deal with the above-listed issues. If your project has Category 2 or 3 components, then appropriate next steps will likely involve further environmental and social review and management, and the outcomes of this work should also be summarized here. Relevant guidance should be obtained from Section 7 for Category 2, and Section 8 for Category 3.

Following the ESS screenings, an additional output has been added under Component 2 of the UNDP-implemented, GEF-financed project.

Output 2.8: Development of guidelines for environmental and social safeguards of utility-scale RE projects implemented under the TSP NAMA, based on international benchmarks (e.g. World Bank)

D. Sign Off

Project Manager **Date**

PAC **Date**

Programme Manager **Date**

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In this section, you should summarize actions that will be taken to deal with the above-listed issues. If your project has Category 2 or 3 components, then appropriate next steps will likely involve further environmental and social review and management, and the outcomes of this work should also be summarized here. Relevant guidance should be obtained from Section 7 for Category 2, and Section 8 for Category 3.

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Output 2.8: Development of guidelines for environmental and social safeguards of utility-scale RE projects implemented under the TSP NAMA, based on international benchmarks (e.g. World Bank)

D. Sign Off

Project Manager	Date
PAC	Date
Programme Manager Jihène TOUIL Chargée de Programme Environnement et Energie PNUD TUNISIE	Date 18/08/2014

10

Environmental & Social Safeguards Annex A.2

A. Supplementary information for 10 MW PV Plant at Tozeur

1/Quel standard a été utilisé pour la réalisation de l'EIE

L'étude d'impact environnemental et social de la centrale solaire de Tozeur a été établie conformément aux termes de référence de la STEG, tout en tenant compte des politiques opérationnelles de la Banque Mondiale, ainsi que la Directive de développement durable de la KFW. Le présent rapport d'étude comprend ainsi 05 grandes parties, à savoir :

1. Un résumé non technique de l'EIES

Cette partie décrit d'une façon sommaire et récapitulative les principaux aspects analysés dans le présent rapport.

2. Le cadre règlementaire et institutionnel en vigueur

Un passage en revue des principaux textes règlementaires en vigueur en liaison avec l'énergie et l'environnement sera présenté, ainsi que les principales institutions qui interviennent dans ces deux secteurs.

3. La description et la justification du projet

Cette partie de l'EIES porte sur la description du projet, les étapes de sa conception et de sa mise en œuvre.

4. La description et l'analyse de l'état initial du site et de son environnement naturel, socioéconomique et humain

Cette partie de l'EIES est consacrée à l'analyse et à la description détaillée du site du projet et de son environnement dans son état actuel, c'est-à-dire avant réalisation. Elle abordera les principales caractéristiques de la zone, dans un contexte aussi bien local que régional.

5. Analyse des conséquences prévisibles directes et indirectes du projet sur l'environnement

Cette partie de l'étude sera axée sur l'identification des impacts et nuisances prévisibles du fait De l'interaction envisagée entre un projet et l'environnement de son site d'implantation. Cette analyse sera fondée sur la définition de la zone d'impact du projet.

6. Mesures envisagées pour réduire les conséquences dommageables du projet

Une fois les impacts négatifs identifiés, nous nous attacherons à définir les moyens à mettre en œuvre, pour les compenser, les réduire, voire même les éliminer.

7. Plan de gestion environnementale

Cette partie sera consacrée à la synthèse des mesures d'atténuation environnementale, à proposer un plan de suivi et de surveillance environnementale, une estimation des coûts afférents à la mise en œuvre des mesures d'atténuation.

Il y a un tableau sur l'évaluation de la conformité entre la législation nationale et les politiques de sauvegarde de la Banque Mondiale. Est-ce que ca peut servir ?

2/Conformité du projet aux politiques de sauvegarde de la Banque Mondiale

Le tableau ci-dessous présume la conformité de notre projet aux politiques de sauvegarde de la Banque Mondiale :

N°	Disposition de l'OP 4.01	Législation nationale	Analyse de conformité
1	Evaluation environnementale et Sociales : L'OP 4.01 est déclenchée si un projet va probablement connaître des risques et des impacts environnementaux potentiels (négatifs) dans sa zone d'influence.	Exigence de soumission d'une EIE pour tout projet ou activité susceptible d'altérer l'environnement	Conformité entre la législation nationale et l'OP 4.01
2	Examen environnemental préalable: L'OP 4.01 classifie les projets comme suit : • Catégorie A : impact négatif majeur certain • Catégorie B : impact négatif potentiel • Catégorie C : impact négatif non significatif.	L'annexe du décret réglementant les EIE est relativement laconique, il indique simplement une nomenclature de secteur d'activités. Un projet de classification en cours d'élaboration. Le Guide des directives d'EIE établi par le Ministère de l'Environnement présente un champ d'application par type de projet (infrastructures, développement rural, industriel) et non une catégorisation par impact.	Conformité partielle et complémentarité entre la législation nationale et l'OP 4.01
3	Participation publique: L'OP 4.01 dispose que pour tous les projets de Catégorie A et B, les groupes affectés par le projet et les ONG locales	La législation nationale ne dispose pas d'une procédure de consultation et de participation du	Pas de conformité entre la législation nationale et l'OP 4.01

	sont consultés sur les aspects environnementaux du projet, et leurs points de vue seront pris en compte. Pour les projets de catégorie A, ces groupes sont consultés au moins à deux reprises : a) peu de temps après l'examen environnemental préalable et avant la finalisation des termes de référence de l'EIE ; et b) une fois établi le projet de rapport d'EIE. Par ailleurs, ces groupes sont consultés tout au long de l'exécution du projet, en tant que c'est nécessaire.	public relatives aux EIE	
4	Diffusion d'information L'OP 4.01 dispose de rendre disponible le projet d'EIE (pour les projets de la catégorie A) ou tout rapport EIE séparé (pour les projets de la catégorie B) dans le pays et dans la langue locale à une place publique accessible aux groupes affectés par le projet et aux ONG locales avant l'évaluation. En plus, la Banque mondiale diffusera les rapports appropriés à Infoshop.	La législation nationale dispose sur la diffusion des informations relatives aux EIE	Conformité entre la législation nationale et l'OP 4.01

Il apparaît de l'analyse ci-dessous qu'il y a relativement une bonne conformité entre la législation nationale en matière d'étude d'impact environnemental et l'OP 4.01 de la Banque Mondiale.

Toutefois, la législation nationale présente quelques insuffisances en termes de classification des sous-projets (fiche de screening et processus de catégorisation) et de procédures de consultation publique.

3/ Supplementary Notes

Supplementary Note 1

Table1.1 :

3. Does the assessment/review contain the information required for decision making?

Il y a relativement une bonne conformité entre la législation nationale en matière d'étude d'impact environnemental et l'OP 4.01 de la Banque Mondiale.

Toutefois, la législation nationale présente quelques insuffisances en termes de classification des sous-projets (fiche de screening et processus de catégorisation) et de procédures de consultation publique.

Supplementary Note 2

Table1.1 :

4. Does the assessment/review describe specific environmental and social management measures (e.g mitigation, monitoring, advocacy, and capacity development measures).

A/ Analyse des impacts environnementaux et sociaux

L'analyse et l'évaluation des impacts tant environnementaux que sociaux de la centrale photovoltaïque seront réalisées tout en distinguant entre les pressions liées **à la construction**, c'est à-dire limitées à la période de chantier, les pressions liées à **la nature de l'installation et à son exploitation** et les pressions liés à **la phase démantèlement** en fin de vie de la centrale :

- La phase de construction et d'équipement de la centrale
- La phase d'exploitation de la centrale et entretien des installations
- La phase de démantèlement de la centrale après fin d'exploitation

Evaluation des impacts

L'évaluation environnementale des impacts du projet consiste donc à estimer d'une manière objective les effets environnementaux du projet, incluant les répercussions éventuelles sur les populations et leur mode de vie.

L'évaluation des impacts se fait en se basant sur les critères suivants (utilisation de la grille d'évaluation des impacts : voir ci-après) :

- La probabilité d'occurrence de l'impact/risque ;
- La magnitude de l'impact: quelle ampleur peut prendre l'impact ?
- L'étendue de l'impact : sur quelle distance l'effetpeut-il se faire sentir ?
- La durée de l'effet : combien de temps l'effet peut-il se faire sentir ? Sera t-il récurrent ? Cumulatif ?

La méthodologie d'évaluation des impacts se fait selon l'échelle suivante :

- Importance : 1 mineure, 2 moyenne, 3 majeure
- Certitude : C certain, P probable, E peu probable
- Durée : 1 courte, 2 moyenne, 3 longue
- Type d'Impact : + positif, - négatif
- Degré d'atténuation : O impact corrigible, N impact non corrigible.

Ainsi, les impacts seront synthétisés sous forme de grille/matrice d'évaluation comme indiqué ci dessous :

GRILLE D'EVALUATION DES IMPACTS OU MATRICE D'EVALUATION DES IMPACTS LORS DE LA PHASE DES TRAVAUX

	Milieu physique				**Milieu biologique**		**Milieu humain**							
Impact	Climat / Air	Sols	Eaux de surface	Eaux souterraines	Faune	Flore	Urbanisme / habitat	Foncier	Population	Activités socio-économiques	Infrastructures socio-culturelles	Santé	Paysage	Patrimoine historique et cultuel
Travaux de défrichement, nivellement et préparation du site														
Altération du paysage naturel par l'installation du chantier														
Contamination par les huiles de vidange des engins etentrainement des déchets solides et liquides générés														
Des émissions gazeuses à effet de serre par les échappements des véhicules et engins														
Des levées de poussières par la circulation des véhicules et des engins														
Bruits et vibration engendrés par les engins et le matériel														
Utilisation de produits inflammables et toxiques														
Augmentation des risques d'accidents														
Développement du secteur socio-économique														

	Négatif	Positif
Faible		
Moyen		
Important		

B/ Plan de Gestion Environnementale et Sociale (PGES)

La proposition d'un plan de gestion environnemental et social (PGES) du projet durant les deux phases du projet (travaux et exploitation) comprenant :

- Les mesures d'atténuation des nuisances
- Le programme de suivi environnemental et social
- Les mesures de renforcement institutionnel
- L'estimation financière du PGES
- L'attribution des responsabilités des actions envisagées
- L'échéancier des actions à entreprendre.

PLAN DE GESTION ENVIRONNEMENTALE ET SOCIALE (PGES)

A1 - Plan d'atténuation et/ou compensation pendant la phase des travaux

Aspect environne-mental	Impact environnemental potentiel	Mesures d'atténuation / compensation	Responsabilité institutionnelle	Coût estimatif (DT)	Echéancier
Climat	Pasd'impact sur le climat.				
Air	- Rejets de gaz par les installations de combustion, gaz d'échappement des engins et des véhicules de chantier (CO_2, NOx, SOx, etc.); - Emissions de poussières (particules fines de sables, ciment, etc.) soulevées par la circulation des véhicules et des engins dans la zone des travaux, des routes d'accès, ainsi que lors du chargement et du déchargement des matériaux de construction au niveau du site du projet. - Dispersion accidentelle de produits chimiques gazeux.	- Choix des engins et véhicules de chantier de manière à réduire au maximum les odeurs, fumées et poussières - Entretien régulier des engins et camions de chantiers - Arrosage des pistes d'accès - L'utilisation de camions bâchés sera privilégiée.	Entrepreneur	10 000	Le long de la phase des travaux
Sols	- Imperméabilisation du sol par l'utilisation du béton, ce qui implique la perte et la diminution des fonctions naturelles du sol et la perte de capacité de rétention d'eau - Impacts indirects liés à la production de béton, la consommation de ressources naturelles épuisables (granulats), la consommation d'eau, des rejets atmosphériques des fours pour produire le ciment, la consommation éventuelle d'adjuvants polluants, etc. - Tassement du sol par la circulation des camions et véhicules de chantier - Pollution du sol par le déversement accidentel de différents types de rejets hydriques, produits chimiques et lessivage des déchets solides	- Limiter les emprises des travaux par bornage - Prévention de la pollution par stockage approprié des produits chimiques et gestion adéquate des différents types de déchets solides et liquides - Elaboration d'un POI pour la gestion des incidents et accidents de travail - Utilisation des déblais autant que possible - Stabilisation et plantation des déblais excédentaires - Gestion des déchets solides - Gestion des produits toxiques et inflammables - Gestion des rejets liquides - Utilisation de matériau absorbant en cas de rejet accidentel	Entrepreneur	20 000	Le long de la phase des travaux
Eaux de surface et souterraines	- Contamination des eaux de pluie en cas d'interception avec les voies de circulation des engins de chantier - Contamination des eaux souterraines par l'infiltration des lixiviats et les rejets d'eaux usées provenant de la base vie et du besoin des travaux (lavage du matériel, nettoyage du sol)	- Idem pour les sols	Entrepreneur		Le long de la phase des travaux
Faune et flore	- Détérioration d'une partie du couvert végétal pour les besoins de construction, la circulation des véhicules, la pose des câbles, … - Perturbation temporaire de la faune due à l'activité intense de cette phase qui génère des émissions de poussières et des bruits, - Perturbation temporaire de la flore due aux émissions de poussières	- Idem pour l'air	Entrepreneur		Le long de la phase des travaux

Urbanisme	- Pas d'impacts	- Pas de mesures			
Foncier	- Pas d'impacts	- Pas de mesures			
Population	- Pas d'impacts	- Interdire l'accès au site du chantier à toute personne étrangère au chantier et éviter par là tous les risques d'accidents - Gérer au mieux les engins de chantier en vue d'éviter toutes sources de contamination par les huiles et les HC - Gérer au mieux des matières dangereuses et des déchets solides - Adopter les mesures de sécurité pour les ouvriers - Enlever en fin du chantier les équipements, matériaux, installations provisoires et éliminer les déchets et déblais dans des sites autorisés à cet effet - Prévoir des panneaux de signalisation, de réduction des vitesses et installer des ralentisseurs au niveau de l'entrée/sortie du chantier - Procéder à l'arrosage régulier des sections et stopper les travaux par temps de vents forts, etc.	Entrepreneur	10 000	Le long de la phase des travaux
Emploi	- Création de nouvelles opportunités génératrices de revenu - Recrutement de la main d'œuvre locale				Le long de la phase des travaux
Activités économiques	- Risques de perturbation de l'activité agropastorale	- Informer les bergers sur les composantes du projet et de sa durée et les inciter à y adapter les déplacements de leurs troupeaux en fonction du planning de réalisation.	Entrepreneur et STEG		Le long de la phase des travaux
Infrastruc-tures socio-culturelles	- Pas d'impacts	- Pas de mesures			
Santé	- Risques de contamination par substances dangereuses (accident, erreur de manipulation) - Gêne au niveau des voies respiratoires due aux émissions de gaz et de poussières - Risques de sécurité dus à l'utilisation d'équipements lourds et de gros engins de travaux.	- Utiliser des engins équipés de dispositifs d'insonorisation afin de réduire autant que possible les nuisances sonores du chantier - Utiliser des engins de chantier de manière à réduire au maximum les odeurs, fumées et poussières - Entretien des véhicules de chantier dans des sites appropriés (station de service).	Entrepreneur		Le long de la phase des travaux
Paysage	- Impact visuel dans un rayon proche du site	- Clôturer le site du chantier et l'équiper de signalisation adéquate	Entrepreneur	Prévu par le projet	Au début du projet
Patrimoine culturel et historique	- Pas d'impacts	- Pas de mesures			

Supplementary Note 3:

5. Does the assessment/review identify capacity needs of the institutions responsible for implementing environmental and social management issues?

Les mesures de renforcement institutionnel

Il s'agit d'identifier les besoins en matière de renforcement des capacités et en formation et acquisition d'équipement pour la mise en œuvre des mesures d'atténuation et du programme de suivi environnemental et social, ainsi qu'une estimation de leurs coûts.

Ainsi, la STEG est appelée à recruter un spécialiste en environnement qui aura pour tâches principales :

- Le suivi et monitoring du PGE ;
- Le contrôle de l'entreprise chargée de l'exécution des travaux ;
- Le suivi d'exécution du plan d'intervention d'urgence ;
- La conception, l'organisation et la réalisation des sessions sensibilisation et la formation des employés sur les aspects liés à la protection de l'environnement, à savoir :

o La formation sur le cadre institutionnel et réglementation en matière de sécurité et de préservation de la santé publique ;

o La formation en matière des interventions d'urgence;

o La formation sur le cadre institutionnel et réglementation en matière de protection de l'environnement et de gestion des déchets.

Le coût total des mesures de renforcement institutionnel est évalué à 50.000 DT/an.

Supplementary Note 4:

6. Does the assessment/review developed through a consultative process with strong stakeholder engagement, including the view of men and women?

Consultations publiques

Ce sont des réunions publiques d'information sur le projet et les termes de référence ainsi sur les résultats de l'Etude d'Impact Environnemental et Social (EIES) de la centrale photovoltaïque de Tozeur.

1ère consultation

Dates et lieu : le **30 Octobre 2013** au siège du gouvernorat de Tozeur

Participants : (voir la liste détaillée en annexe).

Les organismes qui ont assisté sont résumé :

- Le bureau d'étude RIESG ;
- STEG : Direction sécurité et environnement « DES »;
- STEG : Direction énergies renouvelable ;
- STEG : District Tozeur ;
- Le gouvernorat et la commune de Tozeur ;
- Les directions régionales de Tozeur (Equipements, CRDA, OACA, Environnement) ;
- Représentant du complexe universitaire de Tozeur.

2éme consultation

Dates et lieu : le **14 Mars 2014** à l'Institut Supérieur des Etudes Technologiques de Tozeur

Participants : (voir la liste détaillée en annexe).

Les organismes qui ont assisté sont résumés :

- Le bureau d'étude RIESG ;
- STEG : Direction sécurité et environnement « DES »;
- STEG : Direction énergies renouvelable ;
- STEG : District Tozeur ;
- Le gouvernorat et la commune de Tozeur ;
- Les directions régionales de Tozeur (Equipements, CRDA, OACA, Environnement) ;
- Des étudiants et enseignants dans le l'ISET Tozeur.
- Des entreprises dans le domaine des énergies photovoltaïques

Supplementary Note 5:

7. Does the assessment/review assess the adequacy of the cost of and financing arrangements for environmental and social management issues?

Le coût global du PGES

Le coût global du plan de gestion environnemental et social a été évalué à 114 000 DT, y sont inclus les mesures d'atténuation, le suivi et le contrôle, le renforcement institutionnel et la formation des opérateurs pour les différentes phases de réalisation, d'exploitation et du démantèlement du parc solaire de 10 MW à Tozeur.

Estimation du coût total du Plan des Gestion Environnemental et social (PGES)

	Coûts annuels (DT/an)
Atténuation	54 000
Suivi	10 000
Institutionnel	50 000
TOTAL	**114 000**

B. Supplementary information for 24 MW wind farm at Gabes

I. Introduction

UCP Group is one of the leading American companies in the field of renewable energy. It is present in several countries in the world and is specialized in the development, financing, installation and exploitation of wind and solar parks.

UPC North Africa Renewables, LTD, society mother of the group and entity in American right, is specialized in the development, the construction, the financing and operation of wind farms in North Africa and mainly Morocco and in Tunisia.

UPC North Africa Renewables, LTD created a department "Corporate Social Responsibility - (CSR)", which incontestably constitutes a proof of the implementation of the group policy translating its corporate social responsibility.

This responsibility affects all the levels of the supply and value chains of the company which requires an adequate strategy, flexible and evolving over time.

In this context, an entity belonging to the UPC Group was established in Tunisia, ie

Enerciel, limited liability company, in charge with the implementation of a wind project, the Kechabta project in the area of Bizerte in the north of Tunisia.

The present sheets outlines the standards used to carry out the EIA and SIA of Kchabta project and highlights the main outcomes of the studies as regards the added value brought by the adopted standard to the project design and the corporate social responsibility programme of the company.

II. The standard used to carry out the EIA and SIA

The following environmental and social policies, standards and regulations were used by UPC North Africa Renewables in carrying out the social and environment impact assessments of Kechabta wind farm project:

- Operational policies of world bank:
  - OP 4.01 : Environmental assessment
  - OP 4.04: Natural Habitats
  - OP 4.11: Physical cultural resources
- Environmental Assessment:
  - Environmental Assessment book
- European Directive:
  - Council Directive 97/11/EC of 3 March 1997 amending Directive 85/337/EEC on the assessment of the effects of certain public and private projects on the environment (annex II and Article 4, par. 2)
- International Finance Corporation:
  - Environmental, Health and Safety Guidelines for Wind Energy
- Regulatory texts relating to the ratification of international conventions and protocols:
  - Convention on Biological Diversity : signed by Tunisia at the 1992 Rio de Janeiro Earth Summit and ratified by Act No 93-45 of 3 May 1993
  - Ramsar convention on wetlands : ratified on 3 March 1980
  - Convention on International Trade in Endangered Species of Wild Fauna and Flora, also known as CITES : ratified by Act No 74-12 of 11 May 1974
  - African Convention on the Conservation of Nature and Natural Resources : ratified by Act No 76-91 of 04 November 1976
  - Convention concerning the protection of the world cultural and natural heritage: ratified on 11 December 1974
  - Convention on the Conservation of Migratory Species of Wild Animals (CMS): Act No 86-63 of 16 July1986 authorizing the accession of Tunisia to that Convention.
  - Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention): Act No 95-75 of 07 August 1995 authorizing the accession of Tunisia to that Convention.
  - La convention sur la protection de la mer méditerranéenne contre la pollution le 25 Mai 1977 amendée le 23 Février 1998 (convention de Barcelone).
  - The Convention for the Protection of the Mediterranean Sea Against Pollution (the Barcelona Convention) : ratified by Act No 77-29 of 25 May 1977 and amended by Act No 98-15 of 23 February 1998

III. The added value brought by the adopted standard to the project design

In line with the above mentioned environmental and social safeguard policies, standards and regulations, UPC North Africa Renewables has developed a Corporate Social Responsibility strategy for Kechabta wind farm project, structured along the following lines, namely:

- Humans rights,
- Relation and working conditions,
- Environment,
- Fair practices,
- Communities and local development,
- Health
- Investment in society

❖ Humans rights

Within the framework of the future commitment of UPC North Africa Renewables, with respect to UN Global Compact, the humans right are put forward during all the process of the development of the company projects, by adhering to the fundamental principles stated in the Universal Declaration of Human Rights and this, in their workplace and, more widely, within their respective sphere of influence.

UPC North Africa Renewables, also ensures that it is not complicit in human rights abuses. To this end, UPC North Africa Renewables works currently on the development of an operational strategy covering the following fields of application:

- due diligence
- identification of situations where there is a risk of human rights
- Avoidance of complicity
- Remediation of human rights violations
- protection against discrimination of the vulnerable groups
- protection of civil and political rights
- protection of economic, social and cultural rights., and
- Respect for the fundamental principles the respect of the fundamental principles and the right to work

It should be noted that concerning the wind project Kechabta, in addition to the respect of the Tunisian and international regulation in matters of employment law and the standards inherent to this type of project, a particular attention will be paid to the children rights and gender policy.

❖ Relation and working conditions

Enerciel, Tunisian-law limited liability company, leader of the Kechabta wind project, remains subject to Tunisian legislation related to labour law and the international standards set out by the International Labour Organization.

The company works thus on the development of its responsibility towards its personnel by exploring the following fields of application:

- promotion of employment and the development of the working relationships
- respect of adequate working conditions and social protection
- Applying social dialogue
- privilege health and ensure safety
- development of human capital

- **Environment**

UPC North Africa Renewables, made environment its core of trade by positioning itself in the development of the non-polluting energy sector. It is also aware of the strategic challenge of energy conservation to ensure the planet sustainability over coming decades. In addition to the respect of the local regulation, UPC North Africa Renewables, assures compliance with many environmental standards during the development of its projects, such as:

- environmental and social impact study
- establishment of Environmental and Social Management Plan
- Obtaining ISO 14001 certification during the operation phase
- integration of its projects within the CDM ' ' Clean Development Mechanism' '
- noise impact study of the project

- **Fair practices**

Belonging to UPC Group, UPC Renewables North Africa, is subject to legal and moral obligations of the "Foreign Corrupt Practices Act" (FCPA) which prohibits any

company incorporated under American law or its intermediaries, to give any undue pecuniary or anything of value to a " civil servant " to influence it or to receive any undue advantage.

- **Communities and local development**

- <u>Community involvement</u>

The involvement of UPC North Africa Renewables in the communities consists in performing a proactive outreach work with respect to the surrounding population.

The objective is to support the partnerships with local organizations and stakeholders and to have a responsible corporate citizenship with respect to the community. This is in addition to the need to take responsibility for the impacts on society and environment.

These objectives are achieved through the following actions:

- To consult the representative groups of the community in order to determine the priorities as regards investment in the society and of activities of development of community. A particular attention should be paid to the vulnerable, discriminated, marginalized, non or under-represented groups in order to involve them in the society;
- To be present with civil society with the objective of contributing to the public good and to the development of the communities objectives ; and
- To encourage the people to engage in volunteerism for the benefit of the community and provide support to them.

- <u>Education and culture</u>

Education and culture are the foundations of the socio-economic development and belong to the identity of the community. The culture preservation and promotion as well as a promotion of education compatible with respect for humans rights, have positive impacts on social cohesion and development.

In that sense, UPC North Africa Renewables explores the following courses of action:

- To promote and support education and to start projects intended to improve quality of education and access to education;
- To promote the local knowledge and to participate in the eradication of illiteracy;

- To encourage the enrolment of children in an educational establishment and to contribute thus to overcome barriers which prevent the children from having access to education (child labour for example); and
- To help to protect and safeguard the cultural heritage of the region.

➢ Job creation and skill development

Employment is an objective internationally recognized and socio-economic development-related. By creating job, UPC North Africa Renewables can contribute to poverty reduction and to the promotion of the socio-economic development.

This being said, skills development is a crucial precondition in the promotion of employment and the assistance brought to the people to ensure a decent and productive work.

UPC North Africa Renewables implemented the following actions:

- Analysis of its investment decisions impact on job creation and, if it is economically viable, proceed with direct investments, reducing thus poverty by job creation;
- Analysis of outsourcing decisions impact on job creation , at the organization which makes the decision level and at the external organizations affected by these decisions level;
- Analysis of the advantage associated whit the creation of direct jobs as regards the performance of the work and this, through prompting sub-contractors to recruit the he local labour force.

➢ Development of technologies and access to technology

Information and communication technology become essential in our contemporary life and constitutes a meaningful basis valid for many economic activities. The access to information is the key making it possible to overcome the disparities between countries, regions, generations, sexes, etc. Upc North Africa Renewables can contribute to the improvement of the access to these technologies by the training activities, partnerships etc.

For this purpose, it is appropriate that the company:

- To examine its contribution to the development of innovating technologies which can contribute to address the social and environmental issues in the local communities, and
- To explore partnerships with organizations such as the universities or of research laboratories in order to improve the scientific and technological development with partners belonging to the population and, employs local population for these works.

➢ Creation of wealth and incomes

Competitive and diversified companies and cooperatives constitute a major strength for wealth creation within any community. UPC North Africa Renewables will contribute to create an environment in which the support for business creation can thrive, ensuring sustaining advantages of incomes in the form of:

- Support programme for business creation,
- Development of local suppliers and job creation for the community members, and
- More significant efforts to strengthen the economic resources and social relations which facilitate the socio-economic well-being or generate advantages for the community.

Furthermore, by helping to create wealth and incomes for the community members, UPC North Africa Renewables could play a significant role in the poverty reduction. The programmes of support for business creation and the co-operatives targeting women are particularly significant initiatives because it is widely acknowledged that the empowering women contributes largely to the wellbeing of society.

The physical and socio-economic isolation of the communities constitutes an obstacle to their development. In this context, UPC North Africa Renewables play a positive role in the development of communities by integrating the local population in its activity and its value chain.

It is thus appropriate for UPC North Africa Renewables:

- To examine the support to be provided to the appropriate initiatives intended to stimulate the diversification of the existing economic activity within the community;
- To explore the possibility of giving preference to local suppliers of products and services and to contribute, if possible, to the development of these suppliers;
- To consider contributing to sustaining programs and partnerships which support the community members, in particular women and the young people, to create companies and cooperatives, by improving the productivity and promoting the support for business creation. These programs can, for example, ensure trainings on literacy, post-literacy, business planning, marketing, etc;
- To support the organizations and people providing the necessary products and services to the community, which can also generate local employment; and
- To examine the suitable means to contribute to the development of associations of contractors based in the community;

❖ **Health**

UPC North Africa Renewables attaches importance particular to its employees' health and to its projects impact on the surrounding communities' health. To this end, the company oversees the following actions:

- To try to eliminate the adverse health consequences of all processes inherent to the organization;
- To plan to promote health by while contributing, for example, to ensure the access to drugs and vaccination and by encouraging healthy lifestyles;
- To plan to raise awareness of health threats and serious illnesses; and
- To plan to support facilitating a universal and sustainable access to the essential services of health and clean water and to adapted sanitary facilities, as means of preventing the diseases.

❖ **Investment in society**

To identify investment opportunities for the society, UPC North Africa Renewable will adapt its contribution to the needs and the priorities of the communities in which it operates, by taking account of the priorities fixed by the local and national decision makers. The information sharing, consultation and the negotiation are all tools used by UPC North Africa Renewables to allow a participatory approach of the identification and implementation of investment in society.

It is appropriate thus that UPC North Africa Renewables:

- To take account of the promotion of community development in planning investments project in society, for example, by increasing local purchases and by having recourse to local resources so as to support local development;
- To avoid action which perpetuate the dependence of a community with respect to philanthropic activities, permanent presence or the support of the organization;
- To plan a partnership with other organizations, including the authorities and companies, in order to maximize synergies and to use complementary resources, knowledge and skills.

IV. Corporate social responsiveness scheme of Kchabta project

The process of economic and social integration will be ensured at agro-pastoral projects and rural population levels.

Following the approval of the project by the population, the interviews and consultation held with the families led to five types of projects focused in priority on:

- Regional opening-up by a technical assistance to improve the road infrastructure, maintains it and the tracks;
- Combating poverty by permanent professional insertion of certain heads of household in the project;
- Assistance to the creation of productive model projects of agro-pastoral nature. The ground remains the primary resource for the needs of future productive activities;
- Improvement of the standard of living and the comfort of households through houses restoration, drinking water and electricity supply;
- A project of school restoration and facilitation of educational actions for children.

In this context, the investors committed to finance ten projects closely related to the 20 houses located around the park. in order to maintain a sense of responsibility among the beneficiaries, the financing mechanism of the projects is designed around the micro-credit/aid concept. The micro-financing and the financial aid will be distributed equitably between the various families, generations and sexes. Under such conditions, the micro-credit scheme is built on the necessary engagement and responsibility to the viability of the projects designed on the basis of an existing potential, ie rural know-how.

The implemented projects and granted aid during the development phase of Khabta project are presented hereinafter.

Projects	**Number of beneficiaries**	**Monitoring**	**Management**
Roads and path	Local Labour	Enerciel	civil works company
Staff recruitment	10	Enerciel	
Assistance to improvement of bovine breed, and poultry farming	8	Enerciel	Agricultural development regional office (CRDA)
Beekeeping	2	Enerciel	Training center and Agricultural development regional office
House restoration	20	Enerciel	UPC-Enerciel - Architect
Drinking water supply	18	Enerciel	UPC-Enerciel - Architect
Electricity supply	16	Enerciel	UPC-Enerciel - accredited companies
Schooling	children	Enerciel	inspectorate - NGO

Annex 7.5. Agreements

Five co-financing letters are submitted, from ANME, STEG, Enerciel/UPC, Ministry of Equipment, Land Planning and Sustainable Development, and UNDP. ANME's letter of co-financing also covers GIZ co-financing through projects that are implemented by ANME.

A letter of support for the restructuring of the Energy Transition Fund has also been provided by ANME.

الوكالة الوطنية للتحكم في الطاقة

AGENCE NATIONALE POUR LA MAÎTRISE DE l'ENERGIE

ANME

002302

25 JUIN 2014

20 June 2014

Ms. Adriana Dinu,
UNDP – GEF Executive Coordinator and Director a.i.,
UNDP-GEF,
304 East 45th Street, 9th Floor, New York, NY 10017, USA.

Subject: Co-Financing for UNDP-GEF project, "NAMA support for the Tunisian Solar Plan"

On behalf of ANME (Agence Nationale pour la Maîtrise de l'Energie), I am pleased to express my full support and endorsement of the UNDP-implemented, GEF-financed project on "NAMA support for the Tunisian Solar Plan". The project is aligned with, and supportive of, the work of the ANME, notably in the areas of promotion of renewable energy, development of a regulatory framework for independent power production, and reduction of greenhouse gas emissions related to electricity generation.
The following self-financed projects and donor-supported projects implemented by ANME will provide support for Component 2 of the GEF project.

Sources of co-financing	Name of Co-financier	Type of co-financing	Amount (US$)
National government	ANME	Cash	492, 640
Bilateral Aid Agency	GIZ (BMU) "Support to the Mediterranean Solar Plan"	Grant	9,674 ,000
Bilateral Aid Agency	GIZ (BMU) "Capacity building on greenhouse gas emission inventory and MRV system in Tunisia"	Grant	1,340,000
Multilateral Aid Agency	World Bank **"Partnership for Market Readiness"**	Grant	3,000,000

ANME will also be committing a US$200,000 in-kind contribution for Outputs 1.1 and 1.2 of Component 1 (The enabling framework and methodologies are established to support implementation of the TSP). In total, therefore, ANME cash co-financing for the GEF project will total US$14,506,640 and in-kind co-financing will total US$200,000, for an overall total of US$14,706,640.

ANME thanks the Global Environment Facility for its support to this project and looks forward to the commencement of the project and our future collaboration.

Sincerely,

Hamdi HARROUCH

Le Directeur Général
l'Agence Nationale pour la Maîtrise de l'Energie
Hamdi HARROUCH

Cité Administrative Avenue du Japon B.P. 213 1073 Montplaisir

المقر الإجتماعي : الحي الإداري مونبليزير شارع اليابان ص.ب. 213 – الهاتف: 900 906 71 (216) – الفاكس: 624 904 71(216)
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EnerCiel Tunisie

Tunis, 24 April 2014

Ms. Adriana Dinu,
UNDP – GEF Executive Coordinator and Director a.i.,
UNDP-GEF,
304 East 45th Street, 9th Floor, New York, NY 10017, USA.

Subject: Co-Financing for UNDP-GEF project, "NAMA support for the Tunisian Solar Plan"

On behalf of EnerCiel Tunisie, I am pleased to express my full support and endorsement of the Global Environment Facility (GEF) project on "NAMA support for the Tunisian Solar Plan". The project is aligned with, and supportive of, the work of EnerCiel Tunisie, notably in the area of promotion of renewable energy in the private sector.

EnerCiel Tunisie will support the GEF project through grant (cash) co-financing of **US$ 33,476,000** for Component 3 (design and implementation of renewable energy NAMAs to demonstrate the transformational role of the Tunisian Solar Plan to reduce emissions) through its project with the "Societe des Ciments de Gabes",of a 24 MW grid-connected wind farm in Bizerte area ,Tunisia

EnerCiel Tunisie thanks the Global Environment Facility for its support to this project and looks forward to the commencement of the project.

Sincerely,

General Manager
Omar Ben Hassine Bey

EnerCiel Tunisie Sarl - RC: B 135241999 - MF: 644830 L/A/M/000 - CD: 733045C
Tel. : (+216) 71 730 729 - Fax: (+216) 71 730 650 - 3 Rue Sophonisbe - 2016 Carthage - Tunisie
Web : upcnarenewables.com

Société Tunisienne
de l'Electricité et du Gaz

الشركة التونسية
للكهرباء والغاز

Direction des Etudes et de la
Planification

Ms. Adriana Dinu,
UNDP-GEF Executive Coordinator and
Director a.i.,
UNDP-GEF
304 East 45th Street, 9th Floor, New
York, NY 10017, USA

75

Objet : Projet de soutien de NAMA au Plan Solaire Tunisien.

30 MAI 2014

Madame,

Faisant suite à la lettre réf. ANME / 001397, nous exprimons notre soutien à l'ANME et GEF (Global Environnement Facility) dans le projet "NAMA Support for the Tunisian Solar Plan" au niveau de la composante 3 du projet (Design and implementation of renewable energy NAMAS) .

Ce projet correspond bien aux orientations de la STEG pour le Developpement des énergies renouvelables, l'efficacité énergétique et la réduction des émissions des gaz à effet de serre dans la Production de l'électricité.

Dans ce cadre, la STEG est en phase de préparation pour le lancement d'un A.O pour la réalisation, en 1ère étape, d'un projet d'une Centrale Photovoltaïque d'une puissance de 10 MW à Tozeur avec un coût d'investissement estimé à US$ 16,5 Million.

Veuillez agréer, Madame, nos salutations distinguées.

Le Président Directeur Général

Rachid BEN DALY HASSEN

Siège Social : 38, Rue Kamel Ataturk, BP 190-1080 Tunis CEDEX - المقر الاجتماعي 38، نهج كمال أتاتورك ص ب 190-1080 تونس سيدكس
Site Web : www.steg.com.tn Courriel : dosc@steg.com.tn (216) 71 341 311 (216) 71 341 401 / 71 349 981 / 71 330 174

REPUBLIC OF TUNISIA
***

MINISTRY OF EQUIPMENT, LAND-USE PLANNING
AND SUSTAINABLE DEVELOPMENT

26 June 2014

Ms. Adriana Dinu,
UNDP – GEF Executive Coordinator and Director a.i.,
UNDP-GEF,
304 East 45th Street, 9th Floor, New York, NY 10017, USA.

Subject: Co-Financing for UNDP-GEF project, "NAMA support for the Tunisian Solar Plan"

On behalf of the Ministry of Equipment, Land-Use Planning and Sustainable Development, I am pleased to express my full support and endorsement of the Global Environment Facility (GEF) project on "NAMA support for the Tunisian Solar Plan". The project is aligned with, and supportive of, the work of the Ministry of Equipment, Land-Use Planning and Sustainable Development in tackling climate change notably through the promotion of less carbon intensive technologies and the reduction of greenhouse gas emissions.

The Ministry of Equipment, Land-Use Planning and Sustainable Development will support the GEF project through an in kind co-financing of **US$100,000**, for outputs 2.1 and 2.2 of Component 1 (The enabling framework and methodologies are established to support implementation of the Tunisian Solar Plan).

The Ministry of Equipment, Land-Use Planning and Sustainable Development thanks the Global Environment Facility for its support to this project and looks forward to the commencement of the project and our future collaboration.

Sincerely,

P / Le Ministre de l'equippement
de l'amenagement du territoire
et du developpement durable
Directeur Général de l'Environnement
et de la Qualité de Vie

Hassini Salah

Programme des Nations Unies pour le Développement

13 June 2014

Ms. Adriana Dinu,
UNDP – GEF Executive Coordinator and Director a.i,
UNDP-GEF,
304 East 45th Street, 9th Floor, New York, NY 10017, USA.

Subject: Co-Financing for UNDP-GEF project, "NAMA support for the Tunisian Solar Plan"

On behalf of UNDP Tunisia, I am pleased to express my full support and endorsement of the Global Environment Facility (GEF) project on "NAMA support for the Tunisian Solar Plan", which was developed in close collaboration with the National Agency for Energy Conservation (Agence Nationale pour la Maitrise de l'Energie). The project is aligned with, and supportive of, the work of UNDP, notably in the area of climate change mitigation and promotion of renewable energy.

UNDP Tunisia will support the GEF project through grant co-financing of **US$ 600,000**, primarily for Component 1 ("The enabling framework and methodologies are established to support implementation of the Tunisian Solar Plan").

UNDP Tunisia thanks the Global Environment Facility for its support to this project and looks forward to the commencement of the project.

Sincerely,

NATIONS UNIES TUNISIE * P.N.U.D. *

Mr. Mounir Tabet
Resident Representative
UNDP Tunisia

Signature

الوكالة الوطنية للتحكم في الطاقة
AGENCE NATIONALE POUR LA MAÎTRISE DE l'ENERGIE
ANME

0 8 JUIL. 2014

002507

Ms. Adriana Dinu,
UNDP – GEF Executive Coordinator and Director a.i.,
UNDP-GEF,
304 East 45th Street, 9th Floor, New York, NY 10017, USA.

Subject: Letter of Support for the Restructuring of the Energy Transition Fund - UNDP-GEF project, "NAMA support for the Tunisian Solar Plan"

ANME (Agence Nationale pour la Maîtrise de l'Energie) is fully supportive and endorses the Global Environment Facility (GEF) project on "NAMA support for the Tunisian Solar Plan" that will be implemented by the ANME (Agence Nationale pour la Maîtrise de l'Energie).

In particular, the Agency is supportive of "Output 2.6: Establishment of a restructured Energy Transition Fund (ETF) to support NAMA implementation, and analysis of the following financial instruments to capitalise the fund: concessional loans, green credit lines, fiscal incentives, donor contributions, a carbon tax, and climate finance".

ANME would like to mention that the previous National Fund for Energy Conservation (Fond National de Maîtrise de l'Energie, FNME) was redesigned into the Energy Transition Fund in January 2014. While the sources of capitalization have been increased, they will not suffice to attract the necessary funding to implement the Tunisian Solar Plan. Output 2.6 of the GEF project will be vital for proposing a basket of policy and financial derisking instruments to support the implementation of the TSP that will deliver numerous sustainable development co-benefits, including the large-scale reduction of greenhouse gases.

ANME thanks the Global Environment Facility for its support to this project and looks forward to the commencement of the project and our future collaboration.

Sincerely,

Hamdi HARROUCH

Director General

المقر الإجتماعي : الحي الإداري مونبليزير شارع اليابان ص.ب. 213 – الهاتف : 900 906 71 (216) – الفاكس : 624 904 71(216)
البريد الإلكتروني : E-mail : boc@anme.nat.tn
Siège Social : Citée Administrative Montplaisir, Avenue de Japon B.P. 213 - Tél.: (216) 71 906 900 - Fax : (216) 71 904 624

Annex 7.6. Outline of the Territorial Performance-Based Mechanism (TPBM).

The UNDP-implemented, GEF-financed project proposes to develop a performance-based mechanism to support the implementation of the TSP NAMA as well as delivering sustainable development benefits in the (sub-national) regions – Tunisia has a total of 24 governorates. This approach has been termed a 'territorial performance-based mechanism' (TPBM). This mechanism will be technology-specific and its design will draw from the DREI analysis introduced in Section 1.6 and Annex 7.3.

For implementation, the TPBM will be linked with the restructured Energy Transition Fund (ETF) that is proposed in Output 2.6 of the Results Framework. The TPBM is fully consistent with the principal objectives of the TSP, which seeks to deliver sustainable development dividends (Sections 1.2.4 and 2.4) at the regional level while seeking to diversify the Tunisian energy mix. An innovative aspect of the TPBM is that it will be developed in conjunction with the reduction of region-specific risks where these apply through the use of region-specific public instruments.

The TPBM will form an integral part of the Technology Action Plans (TAPs) proposed in Output 2.5 for the implementation of the TSP NAMA. The TAPs are necessary since the three technologies proposed in the TSP NAMA (solar PV, CSP and wind) are different and, as shown in Section 1.6 and Annex 7.3, they require different combinations of public de-risking instruments and incentives (PV). It is expected that the combination of public instruments and incentives will change at the level of the regions and it will vary for the different technologies.

The territorial approach will take into consideration several spatially-specific considerations, including (not exhaustive) the endowment of renewable energy resources (e.g. Figure 7.3.1(a) for wind energy resources) and the grid network (Figure 7.3.1 (b)).

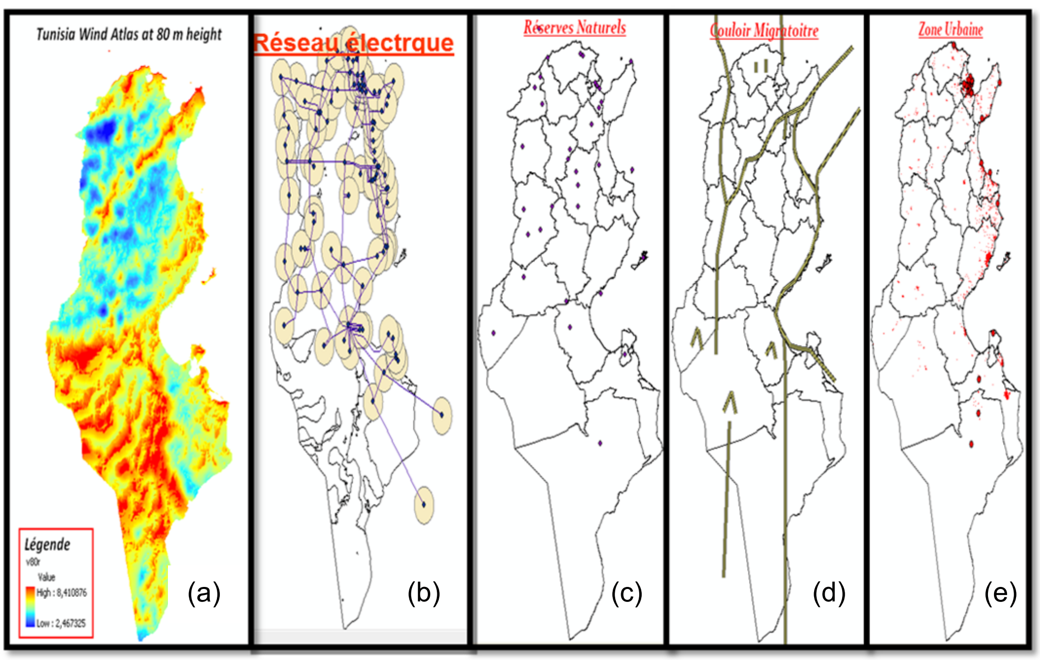

Figure 7.6.1. Spatial maps of Tunisia covering: (a) wind energy resources; (b) grid network; (c) natural reserves; (d) migratory paths of birds; and (e) urban populations.

In the specific case of wind energy, the geographical locations of nature reserves (Figure 7.3.1(c)) and the migratory paths of soaring birds (Figure 7.3.1(d)) will have to be considered. Another geographical constraint for the implementation of RES is the location of civil populations as shown in Figure 7.3.1(e). Another technology-specific constraint is the availability of water resources for CSP (not shown).

In order to promote socio-economic dividends in the form of regional development and job creation, which the TSP seeks to achieve, the TPBM will also include geographically-sensitive factors such as: (1) fiscal incentives that are provided by GoT to promote investments in regions; (2) unemployment; and (3) availability of business and extension services, among others. The exact spatial constraints and parameters that will be considered in the TPBM will be finalised during project implementation based on the development orientations of the Government related to trade-offs between maximising renewable electricity generation and optimising the sustainable development benefits of the TSP.

In sum, the TPBM will be based on delivering sustainable development benefits to the regions through the promotion of specific (to be determined by geospatial analysis during project implementation) installed capacities of the three RE technologies. It will include region-specific packages of a combination of public de-risking instruments and incentives (where applicable). The incentive, which is here termed a 'proxy FiT', will be based on the difference in LCOEs between the RE-generated electricity and the baseline (which is CCGT electricity in Section 1.6 and Annex 7.3, but could also be another baseline fossil such as coal in the future).

The incentive in the TPBM is called a 'proxy FiT' to distinguish it from the full compensation (either through a FiT or negotiated purchase price of electricity in a PPA) that would be required to make RES cost-competitive with the baseline electricity as shown in Figure 15 for wind energy and Figure 7.3.1 for PV. The DREI analysis shown in Section 1.6 and Annex 7.3 clearly show that any incremental incentive – i.e. 'proxy FiT' – that will be required to support RES once public instruments are in place in the form of policy and financial de-risking instruments is significantly more cost-effective compared to the situation when full compensation is required in the form of a FiT/PPA. The preliminary DREI analysis carried out in the design of this Project Document shows that a 'proxy FiT' may even not be necessary in the case of wind energy. The de-risking approach proposed in this UNDP-implemented, GEF-financed project rests precisely on the cost-effectiveness of de-risking renewable energy investments through public instruments.

Previous studies on the use of FiTs to promote RES in Tunisia have focused primarily on providing full compensation against the baseline without considering the cost-effectiveness of de-risking public instruments.[89] Further, these studies have focused primarily on the quantity of renewable resources to propose FiTs. While renewable energy resources are certainly an important parameter in determining the financial viability of RE projects, the DREI analyses presented in this document have clearly shown that there are other barriers that give rise to risks that increase the cost of capital for RE investments in Tunisia. As discussed above, this is in addition to the fact that a full compensation in the form of a FiT may not be the most cost-effective means to promote investments in RES. While the preliminary DREI analyses have concentrated on risks at the national level, the TPBM will bring more granularities in DREI analyses during project implementation to investigate any region-specific risks, and their impacts of investments, through its territorial approach.

In summary, the TPBM is expected to be less costly than a full compensation modality in the form of a FiT. The TPBM can be financed through a dedicated window of the ETF. One of the outputs of the UNDP-implemented, GEF-financed project is to support the ETF by diversifying its sources of capitalisation. In particular, the dedicated window of the ETF that can be used to fund the TPBM will derive its revenues from the existing sources of the ETF (as shown in Section 1.2.4.2, the ETF currently has an excess of funds), as well as additional sources of funding such as carbon taxes, carbon finance, climate funds, and/or bilateral funding for supported NAMAs (as discussed on pp. 52-53).

[89] For example: ANME (2013), *Calcul de tarif d'achat du kWh éolien en Tunisie* ; and Meister Consultants Group (2013), *Analyse économique de l'introduction d'un système de tarif d'achat de l'énergie renouvelable en Tunisie*.

Annex 7.7. Calculation of GHG emission reductions

The 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.

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

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.

The expected renewable electricity generation from the baseline projects is given in Section 1.3.1 and summarised in Table 7.7.1.

Table 7.7.1. Renewable electricity generation from baseline projects, GWh/yr.

Plant description	Renewable electricity generation, GWh/yr
Tozeur (10 MW PV)	16.9
Gabes (24 MW wind)	86.4

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)".[90]. 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;

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

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 7.7.2 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).

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

Table 7.7.2. Electricity generated and fuel consumption for power plants, 2007-2011.

Fuel Type	Plant	Technology	Installed Capacity (MW)	Date Commissioned	2007 GWh	2007 toe	2008 GWh	2008 toe	2009 GWh	2009 toe	2010 GWh	2010 toe	2011 GWh	2011 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)						3,144,924		3,343,580		3,414,248		3,553,788		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 7.7.3) 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 7.7.3. 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.*[91]

[91] 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 uses both the most recently available statistical data and the current CDM methodological tool to calculate the grid emission factor of an

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 7.7.1.

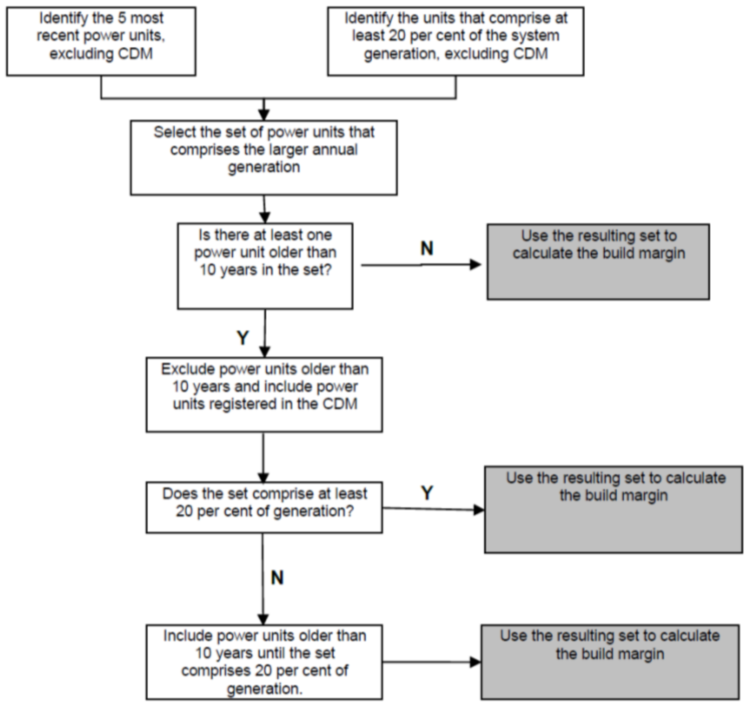

Figure 7.7.1. Procedure to determine the sample group of power units used to calculate the build margin.

The procedure shown in Figure 7.7.1 has been applied to the power park shown in Table 7.7.4 to arrive at the sample group of power units shown in Table 7.7.5.

electricity system.

Table 7.7.4. Power park for calculating BM.

Fuel Type	Plant	Technology	Installed Capacity (MW)	Date Commissioned	2011 GWh	2011 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 7.7.5. Determining the group of power units to calculate BM (colour coding corresponds to units in Table 7.7.4).

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 7.7.5 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 7.7.6 summarises the combined margin grid emission factor for different combination of weights.

Table 7.7.6. 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**

<u>Calculating direct emission reductions (baseline projects)</u>

The emission reduction from PV and wind projects is calculated from Equation 1 using the generation data given in Table 7.7.1 and EF_{grid} = 0.5298 tCO_2/MWh. The results are summarised in Table 7.7.7. The baseline projects are expected to deliver cumulative emission reductions of 218,914 tCO_2 between 2016 and 2019. Assuming technology lifetimes of 20 years, the cumulative lifetime emission reductions have been calculated as 1.094 $MtCO_2$. Using this methodology, the direct emissions reductions calculated here are similar to those given in the PIF after correcting for the updated grid emission factor. In this case, the cost-effectiveness of the GEF interventions in reducing global emissions is estimated at 3.25 US$/$tCO_2$.

Table 7.7.7. Emission reductions from baseline projects.

	GWh/yr	2015	2016	2017	2018	2019	**Total**	
PV	16.9		8,954	8,954	8,954	8,954	**35,815**	tCO2
Wind	86.4		45,775	45,775	45,775	45,775	**183,100**	tCO2
Total	**103.3**						**218,914**	**tCO2**

Adjusted direct emission reductions

In order to calculate the cost-effectiveness of the GEF interventions more accurately, the emission reductions from the baseline projects have been adjusted to take into account the fact that the baseline projects would have taken place in the absence of the UNDP-implemented, GEF-financed project. However, optimal generation of renewable electricity, and hence the reduction of GHG emissions, would not be achieved because of specific flaws in the baseline projects (e.g. inadequate PV technology for application in desert conditions and the absence of grid stability considerations in interconnections) that are discussed in Sections 1.3 and 2.4. In this respect, a more conservative approach has been adopted in the Project Document. A causality factor of 40% has been applied to adjust emission reductions accruing from enhancements in baseline projects through GEF funding.

The more realistic cumulative (20 years) adjusted direct emissions reductions are therefore estimated as 0.44 $MtCO_2$, giving an abatement cost of 8.12 US$/$tCO_2$.

Indirect emissions reductions

The indirect emissions reductions that will result from the implementation of the TSP NAMA have been calculated using the top-down and bottom-up approaches.

Top-down approach

This approach applies a replication factor to the direct project emissions reductions of 1.094 $MtCO_2$. The full project emissions reductions have been used because the indirect emissions reductions are based on the future market potential. The replication factor for market transformation and demonstration capital – i.e. a replication factor 4 – has been chosen because of: (1) direct capital investments in baseline projects (and enhanced by GEF funding); (2) implementation of public instruments to de-risk investments in RES to implement TSP NAMA; and (3) the establishment of a restructured Energy Transition Fund to attract private investments to implement the TSP NAMA. This top-down approach gives indirect emissions reductions equal to 4.38 $MtCO_2$.

Bottom-up approach

The bottom-up approach uses the post-project 10-year market potential as the starting point. The UNDP-implemented, GEF-financed project is expected to terminate at the end of 2019. Hence, the 10 year market potential coincides with the emissions reductions expected between 2020 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 MtCO2).[92] Using these figures, the 10-year emissions reductions potential has been calculated as 26.7 $MtCO_2$. In order to be conservative, a weak causality factor of 20% has been applied to give indirect emissions reductions of 5.34$MtCO_2$.

Compared to the top-down approach, the bottom-up approach gives higher indirect emissions reductions by ~1 $MtCO_2$. Since the TSP anticipates that CSP will be implemented from 2020 onwards, the top-down approach underestimates the indirect emissions reductions because the direct emissions reductions used in the top-down approach do not include CSP. Hence, it is judged that the bottom-up approach, though conservative, gives a more realistic estimate of indirect emissions reductions.

[92] 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.

Annex 7.8. Terms of reference and description of sub-contracts

1. **Government counterparts**

Project Steering Committee (PSC)

Duties and responsibilities:

The Project Steering Committee (PSC) is the principal body supervising the project implementation in accordance with UNDP rules and regulations, and referring to the specific objectives and the outcomes of the project with their agreed performance indicators.

The main functions of the PSC are:

- General monitoring of project progress in meeting its objectives and outcomes and ensuring that they continue to be in line with national development objectives;
- Facilitating co-operation between the different Government entities, whose inputs are required for successful implementation of the project, ensuring access to the required information and resolving eventual conflict situations arising during project implementation when trying to meet its outcomes and stated targets;
- Supporting the elaboration, processing and adoption of the required institutional, legal and regulatory changes to support the project objectives, and overcoming the related barriers;
- Facilitating and supporting other measures to minimise the identified risks to project success, remove bottlenecks and resolve eventual conflicts;
- Approval of the annual work plans and progress reports, the first plan being prepared at the outset of project implementation;
- Approval of the project management arrangements; and
- Approval of any amendment to be made in the project strategy that may arise from a change in circumstances, after careful analysis and discussion of the ways to solve problems.

PSC Structure and Reimbursement of Costs

The PSC will be chaired by ANME. The PSC will comprise the Ministry of Equipment, Land Planning and Sustainable Development, the Ministry of Finance, the Ministry of Economic Development and International Cooperation, STEG, the Energy General Directorate (of the Ministry of Industry), UTICA and ATME, as well as the Project Manager. UNDP will participate as project implementer. If required, representatives of the project stakeholders or other co-financing partners can be invited into the PSC meetings at the discretion of the PSC.

The costs of the PSC's work, except the work of the Project Manager, shall be considered as the Government's or other project partners' voluntary in-kind contribution to the project and shall not be paid separately by the project. Members of the PSC are also not eligible to receive any monetary compensation for their work as experts or advisers to the project.

Meetings

It is suggested that the PSC will meet at least once a year. A tentative schedule of the PSC meetings will be agreed to as a part of the annual work plans, and all representatives of the PSC should be notified again in writing 14 days prior to the agreed date of the meeting. The meeting will be organised provided that the executing agency, UNDP and at least 2/3 of the other members of the PSC can confirm their attendance. The Project Manager shall distribute all materials associated with the meeting agenda at least 5 working days prior to the meeting.

National Programme Director, NPD

As a representative of the Government and the project's implementing agency, the NPD has the principal responsibility of ensuring that the project is executed in accordance with the Project Document and the UNDP guidelines for nationally-implemented (NIM) projects.

His/her main duties and responsibilities include:

- Coordinating and guiding the work of the Project Manager with the work of the national implementing agency through meetings at regular intervals to receive project progress reports and provide guidance on policy issues;
- Certifying the annual and, as applicable, quarterly work plans, financial reports, (Combined Delivery Report), audit reports, inventory of the equipment, and ensuring their accuracy and consistency with the project document and its agreed amendments;
- Taking the lead in developing links with the relevant authorities at the national, provincial and governmental levels and supporting the project in resolving any institutional- or policy-related conflicts that may emerge during its implementation.

2. **<u>Local project Staff</u>**

Project Manager – Local consultant (full-time)

Duties and responsibilities:

Operational project management in accordance with the Project Document and the UNDP guidelines and procedures for nationally-implemented projects, including:

- General coordination, management and supervision of project implementation;
- Ensuring the delivery of project results and leading the implementation process for the 3 project outcomes;
- Developing the terms of references for the technical studies required in the project;
- Management of the procurement and the project budget under the supervision of UNDP to ensure timely involvement of local and international experts, organisation of training and public outreach, purchase of required equipment etc., in accordance with UNDP rules and procedures;
- Submission of quarterly progress reports and provision of inputs for the Annual Project Implementation Reviews to the PSC, Executing Agency and UNDP in accordance with the "Monitoring Framework and Evaluation" section of the Project Document;
- Ensuring effective dissemination of, and access to, information on project activities and results, including regular participation in relevant selected networks;
- Provision of technical inputs in technical assistance outputs of the project;
- Oversight and coordination of the contracts of the international and local consultants working for the project; and
- Ensuring otherwise successful completion of the project in accordance with the stated outcomes and performance indicators summarised in the project's log-frame matrix and within the planned schedule and budget.

Expected Qualifications:

- Advanced university degree and at least 7 years of professional experience, or university degree with 10 years of professional experience, in the specific areas the project is dealing with, including solid knowledge of the energy sector in Tunisia and climate change mitigation (ideally including NAMAs).
- Experience in managing or participating in projects of similar complexity and nature, including a demonstrated capacity to actively explore new, innovative implementation and financing mechanisms to achieve the project objectives;
- Demonstrated experience and success in the engagement of, and working with, the private sector and NGOs, creating partnerships for activities of common interest;
- Good analytical and problem-solving skills and the related ability to adaptively manage with prompt action on the conclusion and recommendations coming out from the project's regular monitoring and self-assessment activities as well as from periodic evaluations;
- Ability and demonstrated success to work in a team, to effectively organise it, and to motivate its members and other project counterparts to effectively work toward the project's objectives and expected outcomes;
- Good communication skills and competence in handling project's external relations at all levels; and
  - Fluent/good knowledge of French and English (Arabic is desirable but not essential);
  - Familiarity and prior experience with UNDP and GEF requirements and procedures are considered an asset.

Allocated Budget: US$ 94,325

Project Administration and Finance Associate (full-time/Service Contract)

A project administration assistant will be recruited on a full-time basis to support project implementation, track contracts and budget delivery, liaise with UNDP Tunisia's Administrative and Finance units to facilitate project implementation, and prepare administrative and financial reports.

Expected Qualifications:

- University degree and at least 2 years of professional experience in finance and administration;
- Demonstrated accounting skills;
- Advanced computer software knowledge, including database management and accounting software;
- Demonstrated ability to work in a team;
- Good communication skills and competence in handling the project's external relations at all levels; and
- Fluent/good knowledge of both French and English languages (Arabic is desirable but not essential).

Allocated Budget: US$ 80,750

Monitoring & Evaluation (M&E) and Communication Officer (full-time/Service Contract)

The M&E officer will report to the NPD and UNDP programme analyst. S/he will support the NPD, PM and the project task teams to prepare the relevant M&E systems required to monitor and assess quality of progress, to identify, collect, analyse, document and disseminate lessons-learned through an annual project meeting, and support the preparation of project evidence for sharing. The M&E officer will liaise with the PM to prepare data collection protocols to enable the task teams to consistently collect data on project progress from project sites and its processing by the NPD for national reporting purposes. The Officer will also conduct outreach and communication about the project.

Responsibilities:

- Establish the overall results-based M&E strategy in accordance with M&E plans outlined in the project document.
- Design a system for collecting information on project lessons to be used in annual progress meetings.
- Guide and coordinate the review of the Project Results Framework, including:
  a. Provide technical advice for the revision of performance indicators.
  b. Identify sources of data, collection methods, who collects data, how often, cost of collection and who analyses the data.
  c. Facilitate annual review of risks by the PM.
- Prepare reporting formats and support the NPD to prepare the required reports. Guide project task teams in preparing their progress reports and perform quality assurance in accordance with the approved reporting formats. This includes quarterly progress reports, annual project reports, field visit reports, inception reports, and ad-hoc technical reports.
- Foster participatory planning and monitoring by advising the training institutions on content for participatory monitoring and evaluation of activities.
- Assist the NPD to collate technical reports and other documents from the project.
- Develop a communication strategy to share the outcomes of the project with stakeholders.

Expected qualifications:

- A university degree in communication, project management or related field
- Prior experience with M&E framework for project management
- Proven capacity in communication on national and local levels
- Fluency in Tunisian Arabic, French and English

Allocated budget: US$ 92,000.

3. **Project Experts (International/National consultancies and/or specialised firms)**

Note: The tasks listed below will be performed either by consultancy firms that include both national and international specialists, or through the procurement of individual national and international consultants brought together to deliver a product. This will be left to the discretion of the Project Manager, subject to approval by UNDP and the Project Steering Committee through annual work plans and budgets. Whichever approach is chosen, a common principle is that these consultancies are short-term and the payment structure will be based on the delivery of products.

Modelling Experts – Local consultants

Two part-time local consultants will be hired to follow up and support the work carried out by the Project Manager and consultancies related to DREI analysis and SDM. The Modelling Experts will have experience in the power sector and with renewable energies specifically.

Expected Qualifications:

- Advanced university degree and at least 10 years of professional experience related to the Tunisian electricity sector, including grid management, generation or other related fields;
- Familiarity with the key characteristics of grid-connected RE investments and technologies in the Tunisian context;
- Demonstrated experience and success in the engagement of, and working with, the public and private sectors;
- Good analytical and problem-solving skills and the related ability to adaptively manage with prompt action, the conclusions and recommendations coming out of the project's regular monitoring and self-assessment activities as well as from periodical external evaluations;
- Should have demonstrable good Excel and financial analysis skills;
- Ability to work, and demonstrated success in working, in a team and to motivate its members and other project counterparts to effectively work towards the project's objectives and expected outcomes;
- Good communication skills and competence in handling the project's external relations at all levels; and
- Fluent/good knowledge of French and English languages (Arabic is desirable but not essential).

Allocated Budget: US$ 240,000 (2 X US$ 120,000)

System Dynamics Modelling (International Expert)

This consultancy will support the development of a system dynamics model for the energy sector of Tunisia. It will include cross-sectoral integration of economic, social and environmental sectors and issues. The dynamic model will be used, in conjunction with the results of the DREI analysis, to establish the sustainable development benefits as discussed in Sections 1.2.4 and 2.4 of the TSP NAMA. The model will also include country-specific indicators (social, economic and environmental) that will assist in formulating a dynamic M&E framework for the TSP NAMA.

Expected qualifications:

- A post-graduate degree in energy modelling, energy economics or related field
- A minimum of 10 years' work experience, especially in modelling the energy sector
- Extensive experience in energy policy analysis
- Experience in working in Tunisia and/or UNDP will be beneficial
- Demonstration of the ability to integrate the linkages between energy and sectors of the Economy, Society and Environment
- Fluency in English and French – both written and spoken – is essential

Allocated budget (US$180,000 International)

Consultancy to develop performance-based mechanism

This consultancy will support ANME in developing and structuring a performance-based mechanism that will be based on the territorial approach described in Annex 7.6. The overall design will include GHG emission reduction and sustainable development considerations.

- A post-graduate degree in geospatial modelling or related field.
- A minimum of 10 years' work experience, especially in developing spatial modelling for the energy sector
- Prior experience in developing geospatial systems based on the guidance given in Annex 7.6 to promote renewable energy.
- Experience in working in Tunisia will be beneficial
- Demonstrable ability for team work
- Fluency in English and French – both written and spoken – is essential.

Allocated budget (US$ 200,000 International; US$ 50,000 National)

Consultancy to monitor and extract lessons-learned from NAMA development

A consultancy will be procured to extract lessons-learned from the NAMA development experience. This consultancy will be carried out at the end of the project lifetime, following the NAMA design and implementation process over the course of the project with bi-annual progress meetings. In addition to supporting project monitoring, the consultancy will help in recording the NAMA process and identifying lessons-learned during project implementation, rather than offering a retroactive view at the end of the project. It will be carried out prior to the Terminal Evaluation of the project.

Allocated budget: US$ 70,000 USD (US$ 30,000 International, US$ 40,000 National)

Consultancies for Mid-Term Review and Final Evaluation

As per the described M&E plan, an international consultant will perform the Mid-Term Review and a different consultant will be recruited for the Final Evaluation. Both consultancies will be fully independent and will follow UNDP/GEF evaluation procedures.

Allocated budget: (US$ 29,200 International)

Annex 7.9. UNDP Direct Project Services Costs

Letter of Agreement

A STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE GOVERNMENT FOR THE PROVISION OF SUPPORT SERVICES

Under project "NAMA Support for the Tunisian Solar Plan"

Government of Tunisia,

1. Reference is made to consultations between officials of the Government of Tunisia (hereinafter referred to as "the Government") and officials of UNDP with respect to the provision of support services by the UNDP country office for nationally managed programmes and projects. UNDP and the Government hereby agree that the UNDP country office may provide such support services at the request of the Government through its institution designated in the relevant project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of the Government-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of the designated institution, the following support services for the activities of the project:

(a) Identification and/or recruitment of project and programme personnel;

(b) Identification and facilitation of training activities;

(c) Procurement of goods and services;

(d) Financial support services

4. The procurement of goods and services and the recruitment of project and programme personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a project, the annex to the project document is revised with the mutual agreement of the UNDP resident representative and the designated institution.

5. The relevant provisions of the A*ccord de base type avec le Gouvernement Tunisien sur l'assistance du PNUD - 25 avril 1987* (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the programme support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the project document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

If you are in agreement with the provisions set forth above, please sign and return to this office two signed copies of this letter. Upon your signature, this letter shall constitute an agreement between your Government and UNDP on the terms and conditions for the provision of support services by the UNDP country office for nationally managed programmes and projects.

Yours sincerely,

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For the Government
Tunisia

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Signed on behalf of UNDP
M. Mounir Tabet
Resident Representative
UNDP Tunisia

Attachment 1

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. In accordance with the provisions of the letter of agreement and the project document, the UNDP country office shall provide support services for the National Agency for Energy Conservation as described below.

2. Support services to be provided:

Support services	**Schedule for the provision of the support services**	**Cost to UNDP of providing such support services (where appropriate)**	**Amount and method of reimbursement of UNDP (where appropriate)**
Services related to procurement (including but not limited to): Procurement of goods Procurement of services o Review of terms of reference for recruitments o Consultant recruitment o Advertising o Short-listing & selection o Contract issuance	Throughout project implementation when applicable	As per the pro-forma costs: o 32 days over 60 months of GS5 Procurement Assistant: US$ 4,936 o 11 days over 60 months of NOB Procurement Manager: US$ 4,302	UNDP will directly charge the project upon receipt of request of services from the Implementing Partner (IP)
Services related to finance (including but not limited to): o Payments o Creation of vendor forms o Issuing cheques	Ongoing throughout implementation when applicable	As per the pro-forma costs: o 65 days over 60 months of GS5 Finance Associate: US$ 10,026 o 11 days over 50 months of NOB Finance Manager: ……US$ 5,736	As above
Total		**US$ 25,000**	