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R2018-0098/1

May 21, 2018

Closing Date: Friday, June 8, 2018 at 6 p.m.

FROM: Vice President and Corporate Secretary

Morocco - Noor Solar Power Project Additional Financing

Project Paper

Attached is the Project Paper regarding a proposed additional loan and Clean Technology Fund (CTF) loan to the Moroccan Agency for Sustainable Energy for the Noor Solar Power Project (R2018-0098), which is being processed on an absence-of-objection basis.

Distribution:
Executive Directors and Alternates
President
Bank Group Senior Management
Vice Presidents, Bank, IFC and MIGA
Directors and Department Heads, Bank, IFC and MIGA

Document of

The World Bank

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Report No: PAD2642

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PAPER

ON

A PROPOSED ADDITIONAL LOAN
IN THE AMOUNT OF US$ 100 MILLION
AND
A PROPOSED CLEAN TECHNOLOGY FUND LOAN
IN THE AMOUNT OF US$ 25 MILLION

TO THE
MOROCCAN AGENCY FOR SUSTAINABLE ENERGY (MASEN)

FOR A

Morocco Noor Solar Power Project Additional Financing

May 15, 2018

Energy and Extractives Global Practice
Middle East And North Africa Region

CURRENCY EQUIVALENTS

(Exchange Rate Effective {Apr 06, 2018})

Currency Unit	=	Moroccan Dirham (MAD)
MAD 9.40	=	US$1
MAD 11.38	=	EUR1

FISCAL YEAR
January 1 – December 31

Regional Vice President:	Hafez M. H. Ghanem
Country Director:	Marie Francoise Marie-Nelly
Senior Global Practice Director:	Riccardo Puliti
Practice Manager:	Erik Magnus Fernstrom
Task Team Leader(s):	Moez Cherif, Sameh I. Mobarek

ABBREVIATIONS AND ACRONYMS

AF	Additional Financing
AFD	French Development Agency (Agence française de développement)
AfDB	African Development Bank
ANAPEC	National Agency for the Promotion of Employment and Capacity (*Agence Nationale de Promotion de l'Emploi et des Compétences)*
ANRE	National Electricity Regulatory Authority (*Agence Nationale de Régulation de l'Energie*)
APO	ACWA Power Ouarzazate
bbl	Barrels of Oil
BE	Electricity Branch (Branche *Electricité)*
BESS	Battery Energy Storage System
CAPEX	Capital Expenditures
CBA	Cost benefit analysis
CCGT	Combined-cycle, Gas-fired Turbine
CESMP	Construction Environmental and Social Management Plan
CO2	Carbon dioxide
COA	Court of Account
COP	Conference of the Parties
CPF	Country Partnership Framework
CPS	Country Partnership Strategy
CSP	Concentrated Solar Power
CSR	Corporate Social Responsibility
CTF	Clean Technology Fund
DA	Designated Account
DAR	Rural Affairs Directorate (*Direction des affaires rurales)*
DBOOT	Design, Build, Own, Operate and Transfer
DNI	Direct Normal Irradiance
DSCR	Debt Service Coverage Ratio
EC	European Commission
EIB	European Investment Bank
EMP	Environmental Management Plan
EPC	Engineering, Procurement and Construction
ERR	Economic Rate of Return
ESIA	Environmental and Social Impact Assessment
ESMAP	Energy Sector Management Assistance Program
ESMP	Environmental and Social Management Plan
ESMS	Environmental and Social Management System
EU	European Union
FEED	Front-End Engineering and Design
FESIA	Framework Environmental and Social Impact Assessment
FESMP	Framework Environmental and Social Management Plan
FSRU	Floating Storage Regasification Unit
GAU	General Affairs Unit

GDP	Gross Domestic Product
GEF	Global Environment Facility
GHG	Greenhouse Gas
GHI	Global Horizontal Irradiance
GoM	Government of the Kingdom of Morocco
GP	Global Practice
GRM	Grievance Redress Mechanism
GW	Gigawatt
Ha	Hectare
HSE	Heath, Safety and Environment
HSSE	Health, Safety, Security and Environment
HTF	Heat Transfer Fluid
IBRD	International Bank for Reconstruction and Development
IFC	International Finance Corporation
IFIs	International Financial Institutions
IFR	Interim Financial Report
IGF	General Inspectorate of Finance
IMF	International Monetary Fund
IP	Implementation Progress
IPCC	Intergovernmental Panel on Climate Change
IPF	Investment Project Financing
IPP	Independent Power Producer
ISO	International Organization for Standardization
ISR	Implementation Status and Results Report
IWGSCC	United States Interagency Working Group on the Social Cost of Carbon
KfW	*German Development Bank (Kreditanstalt fur Wiederaufbau)*
Km	Kilometer
Kv	Kilovolt
kWh	Kilowatt hours
LAP	Land Acquisition Plan
LCOE	Levelized Economic Cost of Energy
LDP	Local Development Plan
LNG	Liquefied Natural Gas
LR	Learning rate
MAC	Marginal Abatement Cost
MAD	Moroccan Dirham
MASEN	Moroccan Solar Energy Agency
MED	Mansour Eddahbi Dam
MENA	Middle East and North Africa Region
MFD	Maximizing Finance for Development
MFS	Minimum Functional Specifications
Mm	Millimeter
MOI	Ministry of Interior
MSF	Molten Salt Fluid
MSP	Moroccan Solar Plan
MW	Megawatt

MWh	Megawatt hour
NIF	Neighborhood Investment Facility
NDC	Nationally Determined Contribution
NPV	Net Present Value
NREL	National Renewable Energy Laboratory
O&M	Operation and Maintenance
OHSAS	Occupational Health and Safety Assessment
ONEE	National Office for Electricity and Water (*Office National de l'Electricité et de l'Eau*)
Moderately satsisfOP	Operational Policy
OPRC	Operational Procurement Review Committee
PDAIRE	Development Master Plan for Integrated Water Resources
PDO	Project Development Objective
PPA	Power Purchase Agreement
PPP	Public-Private Partnerships
PPSD	Project Procurement Strategy for Development
PSA	Power Sales Agreement
PR	Progress ratio
PV	Photovoltaic
RES	Renewable Energy Sources
RFP	Request for Proposal
SEP	Stakeholder Engagement Plan
SESIA	Site-Specific Environmental and Social Impact Assessment
SESMP	Specific Environmental and Social Management Plan
SPV	Special Purpose Vehicle
STEP	Systematic Tracking of Exchanges in Procurement
SVC	Social Value of Carbon
TES	Thermal Energy Storage
TOR	Terms of Reference
UNFCCC	United Nations Framework Convention on Climate Change
VRE	Variable Renewable Energy

BASIC INFORMATION – PARENT (MA- Noor Ouarzazate Concentrated Solar Power Project - P131256)

Country	Product Line	Team Leader(s)		
Morocco	IBRD/IDA	Sameh I. Mobarek		
Project ID	Financing Instrument	Resp CC	Req CC	Practice Area (Lead)
P131256	Investment Project Financing	GEE05 (9263)	MNC01 (392)	Energy & Extractives

Implementing Agency: MASEN

Is this a regionally tagged project?
No

Bank/IFC Collaboration

No

Approval Date	Closing Date		Original Environmental Assessment Category	Current EA Category
30-Sep-2014	30-Jun-2020		Full Assessment (A)	Full Assessment (A)

[ ] Situations of Urgent Need or Capacity Constraints	[ ] Financial Intermediaries (FI)
[ ] Series of Projects (SOP)	[ ] Project-Based Guarantees

Development Objective(s)

The PDO is to increase (a) installed capacity (megawatt) and (b) electricity output (megawatt-hour), especially during peak hours, of the Noor-Ouarzazate Solar Complex.

Ratings (from Parent ISR)

	Implementation	Latest ISR

	16-Nov-2015	17-Jun-2016	03-Nov-2016	06-Feb-2017	18-Sep-2017	15-May-2018
Progress towards achievement of PDO	S	S	S	S	S	S
Overall Implementation Progress (IP)	S	S	S	S	S	S
Overall Safeguards Rating	S	S	MS	MS	MS	S
Overall Risk	M	M	M	M	S	S

BASIC INFORMATION – ADDITIONAL FINANCING (Morocco - Noor Solar Power Project Additional Financing - P164288)

Project ID	Project Name	Additional Financing Type	Urgent Need or Capacity Constraints
P164288	Morocco - Noor Solar Power Project Additional Financing	Restructuring, Scale Up	No
Financing instrument	Product line	Approval Date	
Investment Project Financing	IBRD/IDA	06-Jun-2018	
Projected Date of Full Disbursement	Bank/IFC Collaboration		
31-Dec-2022	No		
Is this a regionally tagged project?			
No			

[ ] Situations of Urgent Need or Capacity Constraints	[ ] Financial Intermediaries (FI)
[ ] Series of Projects (SOP)	[ ] Project-Based Guarantees
[ ] Disbursement-linked Indicators (DLIs)	[ ] Contingent Emergency Response Component (CERC)
[ ] Alternative Procurement Arrangements (APA)	

Disbursement Summary (from Parent ISR)

Source of Funds	Net Commitments	Total Disbursed	Remaining Balance	Disbursed
IBRD	400.00	113.23	268.46	30 %
IDA				%
Grants	119.00	119.00		100 %

PROJECT FINANCING DATA – ADDITIONAL FINANCING (Morocco - Noor Solar Power Project Additional Financing - P164288)

FINANCING DATA (US$, Millions)

SUMMARY

Total Project Cost	2,257.00
Total Financing	2,257.00
of which IBRD/IDA	100.00
Financing Gap	0.00

DETAILS

World Bank Group Financing

International Bank for Reconstruction and Development (IBRD)	100.00

Non-World Bank Group Financing

Counterpart Funding	440.00
Borrower	440.00
Trust Funds	25.00
Clean Technology Fund	25.00
Other Sources	1,692.00
African Development Bank	240.00
EC: European Investment Bank	420.00

FRANCE: Govt. of [MOFA and AFD (C2D)]	180.00
GERMANY: KREDITANSTALT FUR WIEDERAUFBAU (KFW)	852.00

COMPLIANCE

Policy

Does the project depart from the CPF in content or in other significant respects?

[ ] Yes [✓] No

Does the project require any other Policy waiver(s)?

[ ] Yes [✓] No

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Climate Change and Disaster Screening

This operation has been screened for short and long-term climate change and disaster risks

Gender Tag

Does the project plan to undertake any of the following?

a. Analysis to identify Project-relevant gaps between males and females, especially in light of country gaps identified through SCD and CPF

Yes

b. Specific action(s) to address the gender gaps identified in (a) and/or to improve women or men's empowerment

Yes

c. Include Indicators in results framework to monitor outcomes from actions identified in (b)

Yes

PROJECT TEAM

Bank Staff

Name	Role	Specialization	Unit
Moez Cherif	Team Leader (ADM Responsible)	Energy Economist	GEE05
Sameh I. Mobarek	Team Leader	PPP Specialist	GEE05
Abdoulaye Keita	Procurement Specialist (ADM Responsible)	Procurement	GGOPM
Kolie Ousmane Maurice Megnan	Financial Management Specialist	Financial management	GGOMN
Andrianirina Michel Eric Ranjeva	Team Member	Finance Officer	WFACS
Angeline Mani	Team Member	Program Support	GEE05
Christina Jutta Paul	Team Member	Legal Specialist	GTIFP
Elena Segura Labadia	Counsel	Country Lawyer	LEGAM
Khadija Sebbata	Team Member	Program Support	MNCMA
Laila Moudden	Team Member	Financial Management	GGOMN
Manaf Touati	Team Member	Financial Analyst and Energy Specialist	GEE05
Manuel Jose Millan Sanchez	Team Member	CSP Engineer	GEE08
Mark M. Njore	Team Member	Operations Support	GEE05
Markus Friedrich Vorpahl	Social Safeguards Specialist	Social safeguards	GSU05
Robert A. Robelus	Environmental Safeguards Specialist	Environmental Specialist	GEN05
Silvia Martinez Romero	Team Member	CSP Engineer	GEE04
Silvia Pariente-David	Team Member	Economist	MNCMI

Extended Team

Name	Title	Organization	Location
Peter Meier	Lead Consultant (Economic Analysis)		Glasgow

KINGDOM OF MOROCCO

MOROCCO NOOR SOLAR POWER PROJECT ADDITIONAL FINANCING

TABLE OF CONTENTS

I. BACKGROUND AND RATIONALE FOR ADDITIONAL FINANCING

A. Introduction

1. This Project Paper seeks the approval of the Executive Directors for: (a) an additional loan in an amount of US$100 million from IBRD and US$25 million[1] from Clean Technology Fund (CTF) to the *Noor Ouarzazate Concentrated Solar Power Project (P131256)* (parent project); and (b) a Level 2 restructuring of the parent project, as further detailed below. As for the parent project, the additional IBRD and CTF loans will be extended to the Moroccan Agency for Sustainable Energy (MASEN), with a guarantee from the Kingdom of Morocco (duly represented by its government).

2. The parent project was approved by the IBRD Board of Executive Directors on September 30, 2014 with the development objective of "increasing (a) installed capacity (megawatt), and (b) electricity output (megawatt-hour), especially during peak hours, of the Noor-Ouarzazate Concentrated Solar Power Project." The proposed IBRD and CTF Additional Financing (AF) will support further innovative solar power generation in Morocco, beyond the operating Noor-Ouarzazate I plant and the Noor-Ouarzazate II and III plants under construction, by expanding the scope of the original project to support development of Morocco's "Noor" Solar Plan. This would include supporting the development of the Noor-Midelt Solar Power Project in addition to the Noor-Ouarzazate Concentrated Solar Power Project.

3. As a result, the proposed AF includes a Level 2 restructuring of the parent project. The existing Project Development Objective (PDO) will be revised to: "increase innovative solar power generation in Morocco," to encompass all innovative solar power generation in Morocco; the name of the parent project will be changed to *Noor Solar Power Project;* and the closing date will be extended to December 31, 2022, to accommodate developing and constructing the Noor-Midelt Solar Power Project. The proposed restructuring will also reallocate funds from Component 2 (Cost Mitigation Mechanism) of the original project to a new Component 3 in the restructured project. This Component 3 will be dedicated to the Noor-Midelt Solar Power Project investment cost[2], which will include: (a) US$100 million from IBRD and US$25 million from CTF under the proposed AF; (b) US$100 million reallocated from Component 2; and (c) co-financing from other development partners (the African Development Bank (AfDB), the European Investment Bank (EIB), the German Development Bank (KfW), and the French Development Agency (AFD).

B. Country Context

4. After a severe drought in 2016, the Moroccan economy, which still has a sizable agriculture cycle, rebounded in 2017. Driven by a better-than-average cereal harvest, economic growth is estimated to have reached 4 percent in 2017 (compared to 1.2 percent in 2016). The agricultural sector has experienced a strong recovery, with a growth rate of 15.1 percent supported by a cereal production that reached 96 million quintals as a result of favorable weather conditions. The growth of non-agricultural activity remained less pronounced however, at 2.7 percent. The unemployment rate increased from 9.9 percent in 2016 to 10.2 percent in 2017, especially prevalent among the young (26.5 percent), educated (17.9 percent) as well as

[1] An equivalent amount will be processed by the African Development Bank (AfDB).

[2] Component 3 is designed to support construction of Phase 1 of the Noor-Midelt complex much in the same way as Component 1 was designed to support construction of Phase 2 of Noor-Ouarzazate complex.

women (14.7 percent). Average inflation remained low at 0.2 percent. Prudent fiscal policy has helped to further reduce the fiscal deficit in 2017 to 3.5 percent of the Gross Domestic Product (GDP). This outcome is due to a strong revenue performance and the continued rationalization of current spending. Central government debt has been stabilized at around 65.1 percent of GDP.

5. Regarding the current account deficit, it remained at 4.4 percent of GDP for 2016 and 2017. However, the slight improvement of exports (increase of 9.6 percent), has not made it possible to reduce trade deficit as imports, affected by high energy prices, rose by 6.6 percent. In fact, this structural deficit is the result of strong domestic demand, of which a high part is imported. Moreover, high dependency of the new industries (automobile, aeronautics, electronics and an emerging renewable energy equipment industry) to imported inputs increases the external deficit. The implementation of structural reforms will need to accelerate to reduce unemployment, especially among the young, improve the business environment, and enhance higher and inclusive growth potential. Renewable Energy Sources (RES) development will also reduce the vulnerability of the Moroccan economy to unpredictable and volatile factors, such as world oil price fluctuations as it reduces its oil dependency on imports

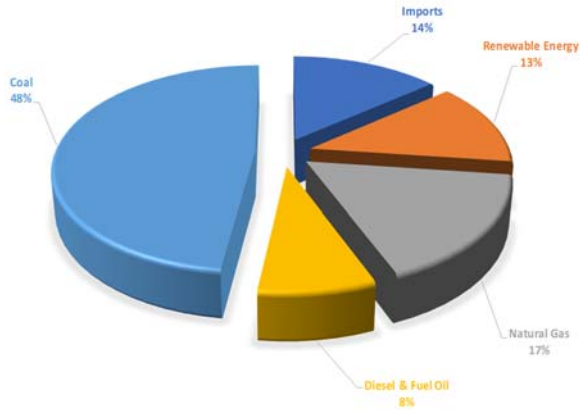
C. Sectoral and Institutional Context

6. The Moroccan electricity sector faces the challenges of rapidly growing demand, strong dependency on high carbon content fossil fuels and difficulties in commissioning new capacity, because of lack of coal and gas importing infrastructure. Electricity demand has been growing rapidly at 6.5 percent p.a. on average since the beginning of the century and reached 35TWh in 2016. The high growth in demand in linked to the GDP growth, further bolstered by population increase and improvements in the standard of living[3]. The rate of access to electricity has increased to 99.5 in mid-2017-- compared to a mere 50 percent ten years ago (and 18 percent in 1995). Despite efforts to improve the efficiency of energy use and the gradual development of distributed generation (in particular with mid-voltage (MV) and low voltage Photovoltaic (PV) programs), electricity demand growth is projected to continue at 5.6 percent p.a. until 2030, with demand reaching 45 TWh in 2020 and 80 TWh by 2030. This requires massive capacity additions, averaging close to 1000 MW per year, if Morocco does not want to increase its reliance on imports.

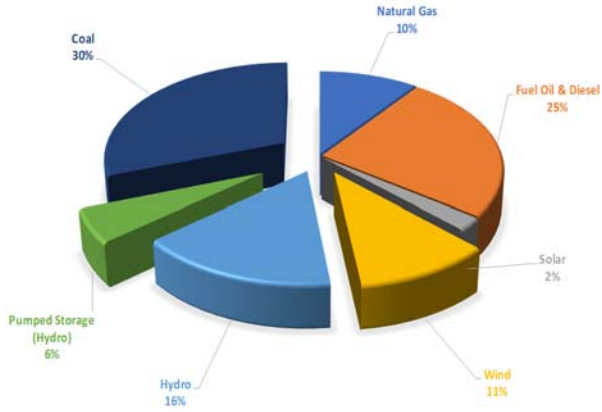
7. After several years of stagnation, Moroccan power generating capacity increased by 2000 MW between 2013 and 2016, a 32 percent increase compared to the level at the end of 2012-- most of it built and operated by the private sector. In line with the National Energy Strategy, 60 percent of those capacity additions were for RES. In 2016, 48 percent of electricity supply was met through coal-fired units while natural gas fired units and imports from Spain cover more than 31 percent of supply. This dependency on high carbon content fossil fuels will decline as RES are scaled-up and natural gas is introduced into the energy mix.

[3] The level of electricity consumption per capita was still very low at the beginning of the century, and despite the strong increase in demand, it is still well below the world average at only 850 kWh per capita.

Electricity Production by Fuel Type (*Source: ONEE 2016)*



Installed Power Generation Capacity by Fuel Type (*Source: ONEE 2016)*



8. Over the last 25 years, the structure of Moroccan power generation has evolved dramatically, from a configuration where oil-fired generation dominated to the current situation where coal and natural gas account for 65 percent and renewables for 13 percent of power generation. Renewable power generation capacity accounts for 19 percent of installed capacity.

9. The electricity market is structured around a national utility, the National Office for Electricity and Water (Office National de l'Electricité et de l'Eau -ONEE), placed under the administrative and technical control of the Ministry of Energy, Mines and Sustainable Development. ONEE operates throughout Morocco's electricity value chain, including generation, transmission, distribution, dispatching and balancing the grid, and acts as single buyer of the electricity supplied to the market from ONEE's own plants (29 percent), from those of independent power producers (IPPs) (52 percent)—except for those under Law 13-09-- and from imports (17 percent). A few private industrial producers generate power for their own needs (less than 1 percent), but that number (as well as the corresponding volume) is expected to increase with liberalization of the mid- and low-voltage markets for RES. For the last 25 years, the power generation sector in Morocco has seen a dramatic shift from a situation where more than 95 percent of total electricity supply was produced by ONEE's own power generation plants, to a configuration where their contribution is below 30 percent. The volume generated by IPPs is also expected to increase strongly in the coming years, as most planned natural gas, coal, wind and solar plants are commissioned under IPP schemes.

10. In the short to medium term, government efforts have been focused on addressing the sector's financial sustainability. Between 2010 and 2015, ONEE revenues increased 62 percent, from MAD 21.5 to 34.9 billion. Such a significant increase resulted from: (i) the revenue impact of the 2012 merger of ONE and ONEP (water utility), leading to an increase of 24.6 percent, and (ii) a progressive increase (+4.4 percent per annum) in electricity tariffs between 2014 and 2017 as planned in the framework agreement between ONEE and the Government of Morocco (GoM).

11. Nonetheless, ONEE's financial situation remained delicate in 2015, with an operating deficit amounting to MAD 2.3 billion (7.2 percent of revenues) and a debt, of MAD 57 billion-- nearly twice its revenue. To improve the utility's financial situation, the GoM agreed with ONEE in 2014 on a financial support

package (the so-called "*Contrat-Programme 2014-17*")[4] of MAD 22 billion, of which MAD 2 billion was earmarked for a capital increase, in exchange for commitments by ONEE to reduce its costs and improve its operating performance. However, while ONEE has continued its ambitious investment program, some of the support measures promised by the Government have not been implemented, such as the lump-sum payment of a subsidy and the full tariff increase.

12. Despite the delay in implementing some of the commitments between ONEE and the Government, ONEE continues to show steady improvement in its financial performance, which turned positive in 2015. This was made possible because of: (i) an increase in electricity tariffs, and (ii) a sharp decline in coal, gas and oil products prices since 2014. The combined effect of increasing revenues and the stable to decreasing expenses continued through 2016, which helped ONEE regain profitability in 2017. ONEE generated a profit of a MAD 790 million in 2016, recovering from a loss of MAD 4.4 billion in 2012.

13. Morocco made the strategic decision to maximize use of its domestic RES and, in 2009, adopted a National Energy Strategy, with a view to reducing the country's dependency on imported fossil fuels, which accounted for almost all of the country's primary energy demand; lowering the economy's energy intensity; and reducing its carbon footprint. The RES target, which was initially set at 42 percent of installed power generating capacity in 2020, was increased to 52 percent by 2030 in Morocco's Nationally Determined Contribution (NDC), putting the country at the forefront of the region in renewable energy (RE) ambitions.

14. The World Bank and CTF, as part of a consortium of other multilateral (e.g., AfDB, EIB, and the EU) and bilateral (e.g., KfW and AFD) institutions, supported development of the first CSP solar complex in Ouarzazate, Morocco, through IBRD and CTF loans. CTF support development of the first phase of the Noor-Ouarzazate Concentrated Solar Power (CSP) complex, and, as discussed further below, both IBRD and CTF supported the second phase of the complex. While Morocco agreed to carry part of the burden for its NDC, significant external support is still needed to cover the new investments to meet Morocco's NDC targets, consistent with the Conference of the Parties (COP) 21 Paris Agreement's "common but differentiated" responsibilities between developed and developing countries.

D. Parent Project

15. Currently, the World Bank/CTF support for the Noor-Ouarzazate Concentrated Solar Power Project consists of the following:

- Financing for the initial investment for Noor-Ouarzazate II and III plants (Component 1 of P131256, Loan IBRD-84400-MA, TF17509): This component is covered by a US$119 million CTF loan and US$100 million from the approved IBRD loan of US$400 million. Construction is well advanced and commissioning is expected in early (Noor-Ouarzazate II) to late (Noor-Ouarzazate III) 2018. The CTF loan is fully disbursed, while component 1 of the IBRD loan is 26 percent disbursed.

- Cost Mitigation Mechanism (Component 2 of P131256, Loan IBRD-84400-MA): The purpose of this

[4] See Annex 4 for further details on the *Contrat-Programme*

US$300 million component of the approved US$400 million IBRD loan is to support the acquisition by MASEN of the electricity produced by the Noor-Ouarzazate plants. Towards that end, this Cost Mitigation Mechanism partially covers the difference in the price at which MASEN buys the electricity generated by the privately-owned and operated Noor-Ouarzazate plants and the price at which MASEN sells this electricity to ONEE (equivalent to the average wholesale cost of power on the high-voltage network). MASEN withdraws funds based on a formula that determines the maximum amount that can be withdrawn[5]. As of June 2017, only Noor-Ouarzazate I is fully operational and eligible for support from this component.

16. Disbursement of Component 2 of P131256 is low (only 5 percent as of November 2017) and below initial projections. Moreover, by the current closing date of June 30, 2020, the loan is not expected to be fully disbursed, leaving at least US$100 million unused. The low disbursement rate of Component 2 thus far is due to the Project's better-than-expected performance in comparison to estimates during appraisal. In particular, the estimated project costs at the time of appraisal were 25-30 percent higher than actual costs at the time of award, reflecting investor confidence in Morocco and continuing improvements of CSP's cost structure. MASEN also structured the Project in a manner that allows them to use the revenue from equity investments and fees on common services to cover the gap between the plants' generation costs and the price at which it is sold to ONEE. As a result, the full amount of the loan under Component 2 will not be needed, thus freeing US$100 million for reallocation to a new Component 3 to supplement financing made available under this AF to cover Noor-Midelt's Phase 1 investment cost.

17. The parent project has been performing satisfactorily for over 12 months. In the latest Implementation Status and Results Report (ISR), all the key project ratings are satisfactory, except for Component 2, whose rating is moderately satisfactory due to the low disbursement rate, as discussed above. The Noor-Ouarzazate I plant was successfully commissioned in early 2016, and is currently operating in a satisfactory manner. The construction of the Noor-Ouarzazate II and III plants has reached 88 percent and 83 percent completion, respectively, as of September 2017.

18. The project ratings are Satisfactory for Financial Management, Project Management, Procurement, and Monitoring and Evaluation, and Safeguards. There are no outstanding audit reports.

E. Rationale for the Additional Financing and Alternatives Considered

19. **Objectives of the AF.** The AF is designed to support development and implementation of Phase 1 of the Noor-Midelt site, consistent with the revised PDO. Expanding solar power generation in Morocco contributes to reaching Morocco's ambitious climate change objectives, as well as energy policy objectives of energy security and reduced import dependency. The AF, like the parent project, will support continued development of the CSP technology globally, which is important to meeting global climate change mitigation objectives. Beyond energy security and climate change mitigation objectives, the AF will also support the Noor plan's objective to promote socio-economic development and improve local competitiveness by

[5] The maximum amount that can be withdrawn is calculated as (A) the amount MASEN paid to purchase power from the project company, minus (B) revenue received from the sale of this power to ONEE, minus (C) any contribution made by the Government towards covering the difference between (A) and (B).

helping to create jobs and opportunities for skills building and training of local communities surrounding the Noor-Midelt site, especially women, youth and the rural poor.

20. Combining this AF financing with excess financing under the parent project helps optimize use of IBRD scarce resources and reflects the lessons learned from the programmatic nature of supporting Masen's innovative project pipeline to implement the Moroccan Solar Plan. The parent project was able to save US$100 million because of better than expected procurement results, in the form of lower bid and capital costs for Phase 2 of the Noor-Ouarzazate CSP complex, and better financial results from Phase 1 of the complex, thus creating an opportunity for scaling up and expanding the impact of the parent project.

21. **Link to World Bank Group Strategy**. The proposed Project is in line with the World Bank's 2013 Energy Directions Paper, and the MENA Climate Action Plan. The MENA Climate Action Plan, announced during COP22, supports the energy transition in the MENA region through reform of state-owned utilities; promotion of private sector engagement and financing; reform of energy pricing, safety nets and tax systems; and support for regional integration. The AF will also support the pillar on regional cooperation of the World Bank Group's MENA Strategy by contributing to Euro-Mediterranean electricity market integration. The AF also has climate mitigation benefits by contributing to Morocco's continuing efforts to maximize use of domestic RES to meet demand and reduce reliance on imported fossil fuels.

22. The proposed Project is aligned with with the Country Partnership Strategy (CPS) for Morocco 2014-2017, which has been extended by one year. Specifically, the proposed project will contribute to the development of the CPS Result Area 2 'Building a green and resilient future' and to Strategic Outcome 2.2. 'Increase renewable energy generation and enhance energy efficiency.' The total climate co-benefits in this project amount to US$ 100 million (100 percent). It also contributes to Strategic Outcomes 1.5, 'Improve the reliability of electricity supply' 3.4, 'Expand access to basic services (water, sanitation, electricity, transport, telecommunications, health, education),' 1.4 'Better leverage socio-economic potential of integrated rural development and tourism' and 1.6 'Skills training with needs of market.' The attention paid to the needs of women and young people in the project is in line with country priorities on gender and youth, which are crosscutting themes throughout the CPS pillars. Furthermore, the project responds to the recent Energy and Extractives Global Practice (EEX) Gender Follow Up Note (2017) and Regional Gender Action Plan for MNA (FY18-23) that call for closing gaps in women's access to economic empowerment and decision-making processes. By helping to meet the country's growing electricity needs, the project will enable social development and economic growth, thus contributing to the World Bank Group's twin goals of ending extreme poverty and boosting shared prosperity in a sustainable manner.

23. The Morocco Country Partnership Framework (CPF) that is currently under preparation is expected to include a broader energy sector dialogue, covering institutional structure, reforms all along the value chain (including distribution), regulation and energy efficiency, and a strategic energy sector engagement note that is in preparation, separately from the AF package. Exploration of solutions to ensure sustainability and financial viability of the whole power sector – not just renewables—is part of that sector dialogue, as the roles and responsibilities are being redefined and reforms are undertaken to improve sector performance, while meeting energy security and climate mitigation objectives at least cost. The proposed Project is a key element in that dialogue, as MASEN is playing an increasingly important role in Morocco's power sector. The Maghreb Infrastructure Diagnosis already under way addresses in a preliminary way the need for reform in the power and water sectors in Morocco.

24. **Maximizing Finance for Development (MFD).** The AF is in line with the MFD approach. The hybrid technology of CSP and PV adopted for the Noor-Midelt Solar Power Plants will reduce the cost of energy generation compared to the parent project, but not enough to make it fully competitive with thermal power sources. As shown in the financial analysis in the Section IV below, the Noor-Midelt plants are still expected to require some element of public subsidy to be financially viable. Thus, a public-private partnership (PPP) funding strategy, combining private equity and public debt financing, is appropriate for such a project, enabling the project to benefit from private sector know-how and lower cost financing from the public-sector window of International Financial Institutions (IFIs) and CTF. However, developing 5000 MW under Morocco's Solar Plan by 2030 will require a shift from limited public sector resources towards commercial debt. MASEN and the Bank are working together on raising US$150 million of commercial debt, with the backing of a guarantee package from IBRD and CTF of up to US$100 million that will be processed under a separate operation, as it requires longer structuring time. This pilot operation would refinance common infrastructure for the Noor-Ouarzazate and Noor-Midelt plants, which was funded by MASEN, and would serve as a catalyst for scaling up MASEN's access to commercial debt markets to fund future projects. By mobilizing commercial debt in MASEN's renewable energy projects, alongside private equity, this would help maximize private sector finance for development in the sector.

II. DESCRIPTION OF ADDITIONAL FINANCING

A. Project Design

25. The Noor-Midelt complex, the next complex in Morocco's solar power program, is expected to be developed in two phases, each consisting of two separate plants. This complex is located 20 km north of the town of Midelt in northern Morocco, in the high plains surrounding the Moulouya river, between the Middle and High Atlas Mountains. The restructuring and the AF support implementation of Phase 1 of the complex, which consists of Noor-Midelt I and II, using a hybrid CSP and PV design, building on each technologies' strength to meet the expected load profile from the plants.

26. Under Noor-Midelt phase 1, each plant comprises 150-190 MW CSP capacity and a minimum of 5 hours of thermal storage. The capacity of the PV component, which is expected to provide daytime generation, is left to the bidders' discretion but cannot exceed night-time net capacity from CSP by more than 20 percent. The PV component of each plant could be approximately 150-210 MW, making the total capacity of each of the proposed plants between 300 MW and 400 MW and the total capacity of Phase 1 600-800 MW.

27. The lifetime CO2 emissions reduction is estimated at 29.5 million tons CO_2 compared to the Liquified Natural Gas (LNG) based alternatives. The lifetime emission reduction of NOx is estimated at 38,470 tons. In addition, the proposed project will promote skills-building assistance among local rural population groups surrounding the Noor-Midelt site, taking into account gender issues.[6]

[6] In response to the findings revealed in the recent World Bank-Energy Sector Management Assistance Program (ESMAP) report on Impacts of Electricity Infrastructure on Men and Women: The Case of Morocco's Ouarzazate CSP Plant, 2017.

B. **Project Cost and Financing**

28. Although final investment cost will not be known until award of both plants to project developers, it is estimated that both plants of Noor-Midelt Phase 1 would cost in the aggregate approximately US$2.3 billion. Phase 1 of Noor Midelt will be partly funded through loans from IBRD of US$100 million and CTF of US$25 million, in addition to the US$100 million reallocated from Component 2. The plants will be developed through the formation of a PPP between MASEN and a competitively-selected private-sector developer for each plant.

29. The competitively selected sponsors will form special purpose vehicles (SPVs) to develop, construct, own, and operate each plant. The sponsors are expected to finance this work based on a gearing ratio of 80:20, requiring US$440 million to be financed by equity, of which US$330 million is expected to be provided by the selected private sector sponsors. The remaining 80 percent of the plant costs will be financed through loans provided by IFIs, including IBRD, CTF, AFD, AfDB, EIB, and KfW, to MASEN, which the latter would then on-lend to the SPVs as their sole lender. As the tariff from the project is still expected to need some element of public support, concessional loans such as those from CTF and loans from IFIs' public windows are needed to reduce the financing costs, thus the amount of public support needed.

C. Lessons Learned and Reflected in the Project Design

30. There are several lessons learned from Noor-Ouarzazate's process that MASEN incorporated into the project design of Noor-Midelt I. These lessons include the following:

- Plant technical design and technology choice: In order to benefit from spectacular cost declines for PV and further reduce the levelized cost of energy (LCOE) (and therefore the 'gap' to be covered by the GoM), MASEN is testing a new concept of hybrid PV/CSP technology. The technical specifications for the CSP part, as well as for storage, are defined to optimize the overall power system and provide ONEE with the flexibility required to integrate intermittent RES and meet peak load at least cost.

- Structure of World Bank support for the Project: The Bank provided MASEN with a US$300 million loan to cover the incremental difference between its costs of purchasing power from Noor-Ouarzazate I, II, and III, and the revenue it received from the sale of this power to ONEE. As discussed above, not much of this facility has been used, thereby the reason for the restructuring. The AF will not have a similar viability gap funding facility as the one approved for NOOR-Ouarzazate.

- Compensation related to associated facilities: One issue on Noor-Ouarzazate was ensuring that compensation is made to the project affected people in communities owning land collectively, particularly related to construction of transmission lines and grid substations. The process of compensating collective communities whose land was crossed by the transmission line was handled using Morocco's unique legal framework for ownership of collective land under a trust relationship given to the Ministry of Interior (MOI) to manage compensation funds. There were initial difficulties in accessing data regarding the use of the funds to compensate the communities during the supervision of the parent project, which were later resolved by coordinating data collection simultaneously with MASEN, ONEE and MOI. A similar process will be followed regarding the Noor Midelt plants and the associated transmission line.

- Energy sector dialogue and using public and concessional funds to leverage commercial financing: Lessons from the Noor-Ouarzazate operations is that concessional funds are needed to kick-start the use of innovative technologies that are more expensive than alternative power generation technologies (but bring in climate mitigation and other social and economic benefits) but a long-term strategy is needed on how to bring in commercial financing that will be necessary to develop the technology at scale, especially when costs start declining. Otherwise, a dependency on concessional financing may develop. The World Bank is engaging in an overall energy sector dialogue in Morocco, including an Infrastructure Diagnosis, that will explore solutions to ensure sustainability and financial viability of the whole power sector – not just renewable – as the roles and responsibilities are being redefined and reforms are undertaken to improve sector performance, while meeting energy security and climate mitigation objectives at least cost. This exercise will include discussions with MASEN on how to standardize the development of RES power plants and to transition to commercial financing and with other donors on the best use of scarce low-cost financing resources.

- Health and safety on construction sites: During the construction of the Noor-Ouarzazate III power plant, MASEN has reinforced safety protocols, which will apply to the Noor-Midelt plants as well.

D. Proposed Changes

31. It is proposed to restructure the parent project to:

a. Modify the PDO of the project from "increasing (a) installed capacity (megawatt), and (b) electricity output (megawatt-hour), especially during peak hours, of the Noor-Ouarzazate Solar Power Project" to "increase innovative solar power generation in Morocco", so that the restructured project can cover both the Noor-Ouarzazate and Noor-Midelt solar power plants. In accordance with World Bank policies, this change requires a Level 2 restructuring;

b. Reallocate funds from Component 2 (Cost Mitigation Mechanism) to a new Component 3 dedicated to covering the construction costs of Noor-Midelt power plants (phase 1); and allocate the AF to Component 3;

c. Change the Results Framework to reflect the change in the PDO and expansion of the Project's scope to include Noor-Midelt, primarily revising the PDO indicators to reflect the programmatic PDO objectives covering the Noor-Ouarzazate and Noor-Midelt complexes in terms of, among others, total energy produced and female beneficiaries, as well as revising intermediate indicators to reflect the parent project's expanded scope and adding an appropriate gender indicator to reflect the Project's gender tag in a more specific way that reflect direct impacts from the plants' construction;

d. Extend the Project's Closing Date from June 30, 2020 to December 31, 2022 to coincide with that of the proposed AF. The Results Framework is revised to reflect the revised PDO and to cover both Noor-Ouarzazate and Noor-Midelt Phase 1 performance indicators; and

e. Rename the Project from the "Noor-Ouarzazate Concentrated Solar Power Plant Project" to "Noor Solar Power Project".

III. KEY RISKS

32. The overall risk rating of the proposed AF is the same as the risk rating of the Parent project and is assessed as "Substantial", due to the technical and financial risks associated with the use of innovative solar power technology. The main risk ratings are further described below and captured in the Systematic Operations Risk-rating Tool (see Table 1 below).

33. The key risks, and proposed mitigation strategy, are the following:

- *Sector strategies and policies risk*. The overall power sector financial performance depends on Government subsidies as electricity prices are not yet cost-reflective. A set of reforms, including a tariff reform, has been launched to improve the sector financial sustainability. The burden on the government budget from the AF should be less than for the parent project as CSP costs have declined and will continue to decline until the bids are due. Moreover, the choice of hybrid CSP-PV technology should reduce costs compared to an almost pure CSP solution, as in Noor-Ouarzazate. Moreover, as discussed above, the World Bank is engaging in an overall sector dialogue to work with the Government to engage reforms and set up an electricity sector regulator whose prerogatives include ensuring the well-functioning of the market for renewable energy. However, the sector financial sustainability is still not firmly established and the sector risk remains rated ***Substantial***.

- *Technical design risk*. CSP, particularly tower technology, is still relatively new, and construction methods and technology innovation are still evolving to address issues that arise during operations of the plants that have been commissioned globally. In this respect, there are risks in implementation, particularly during construction, which will have to be managed carefully. However, these risks are falling as the CSP market is expanding worldwide and operators are gaining experience. Moreover, the mitigation measures put in place by MASEN for the Parent project will apply to Noor-Midelt. The technical risk for the new Project relate more to optimization of plant design (especially the size of the CSP storage and CSP-PV mix) as the country experiments with hybrid plants, and the structure of the power system is changing. The other major technical risk, as the country's installed RES capacity increases, relates to network infrastructure and grid integration of the new plants. The risk therefore remains rated ***Substantial***.

- *Use of concessional climate finance and government subsidies to support CSP*: The Project is testing a new concept of CSP-PV hybridization. However, the CTF funds allocated and possible government subsidies to the Project apply only to the CSP component as PV is already competitive with other sources. With the current design, it is difficult to split the CSP from the PV power generation. As a result, the risk of misinterpreting the CSP subsidy as also benefitting PV remains ***Substantial***.

- *Appetite by private investors, in particular for commercial debt*. The lack of participants to bid on the PPP was identified as a high risk for the parent project. However, the results of the two previous bidding rounds indicated a strong interest by CSP industry players, and a very

competitive process led to prices among the world's lowest. Although the number of participants in the bidding for Midelt is more limited, it is expected to be sufficient to ensure adequate competition. While the transition to a more commercial type of financing is inevitable, some bilateral and multilateral donors are still willing to continue providing very low-cost debt. Mitigation measures include the sector dialogue that the Bank is initiating with GoM and the donor coordination process under way to kick-start the use of commercial financing. The remaining risk is therefore assessed as ***Substantial***.

- *Fiduciary, and environmental and social risks* are described in detail under sections IV.C to IV.F.

Table 1 – Systematic Operations Risk-Rating Tool

Risk Categories	Rating
1. Political and governance	Moderate
2. Macroeconomic	Moderate
3. Sector strategies and policies	Substantial
4. Technical design of project or program	Substantial
5. Institutional capacity for implementation and sustainability	Moderate
6. Fiduciary	Substantial
7. Environment and social	Substantial
8. Stakeholders	Moderate
9. Other	Substantial
Overall	**Substantial**

IV. APPRAISAL SUMMARY

A. Economic and Financial (if applicable) Analysis

34. Economic analysis. The proposed CSP-PV project at Midelt is not economic in the absence of valuation of the GHG emissions avoided by the thermal alternative (which is mainly gas). For the counterfactual based on an onshore LNG terminal as currently planned by the Government, the economic rate of return is 6.9 percent, with an NPV of US$271 million (based on the 5 percent discount rate now used by ONEE, and as used by the Bank for Noor-Ouarzazate II and III, and calculated over a 30-year economic life). At the conventional 10 percent discount rate, the NPV is minus US$267 million before environmental benefits.

35. Local environmental benefits are negligible because Midelt mainly displaces natural gas, which has no particulate matter of 10 microns in diameter or smaller (PM-10), sulfur oxide (SOx) air emissions, or trace element and ash disposal issues, which are normally associated with fuel oil and coal-fired generation. In the early years of Noor-Midelt plant operation, however, some fuel oil and coal-fired generation is also expected to be displaced.

36. When the avoided GHG emissions are included and valued over the range stipulated by the Bank's November 2017 Guidelines on carbon shadow prices, Noor-Midelt becomes economic. For the least cost counterfactual based on Algerian pipeline gas, the economic rate of return increases from 1.1 percent to 3.2 percent at the low shadow price valuation, and to 6.6 percent at the high valuation, with a switching value of US$47 per ton. At the 10 percent discount rate, the switching values are in the range of US$31 to US$122 per ton of CO_2, Midelt is therefore a cost-effective project to reduce carbon emissions, and warrants CTF funding and concessionary finance to buy down the cost of capital. The lifetime reduction in GHG emissions is 29.5 million tons for the LNG counterfactuals, and 24.5 million tons for Algerian pipeline gas.

37. The sensitivity and switching values analysis shows the economic returns to be robust with respect to the two main uncertainties (capital costs of Midelt and the gas price). The probability of not meeting the hurdle rate when GHG emission benefits are included is between 1.5 and 5 percent.

38. Midelt also brings a range of other benefits, including energy security (by increasing supply diversity), global learning curve benefits (by contributing to the global experience of combined PV-CSP technology), and macroeconomic spillovers associated with the establishment of domestic manufacturing industry to produce components (other than the PV panels themselves). However, these benefits are more uncertain in nature, and have not been quantified for inclusion in the economic analysis baseline.

39. **Financial Analysis.** Financing of the up-front capital expenditures will be based on a gearing ratio of 80:20, requiring 20 percent of the project costs to be financed by commercial equity, of which 75 percent will be provided by the selected private sector sponsor and 25 percent by MASEN. The remaining 80 percent of the project costs is expected to be financed through loans provided by bilateral and multilateral IFIs, including WB and CTF, to MASEN. MASEN would then on-lend these funds to the privately-owned and operated SPCs responsible for constructing, owning, operating, and maintaining the plants. MASEN and the SPCs are expected to agree on a competitively-determined levelized cost of energy (LCOE) that will cover repayment by SPC of MASEN loans, returns on the shareholder equity and the plants' fixed and variable operating costs. MASEN would use the cash it receives as repayment of its loans to service its debt to IBRD, CTF and other donors.

40. MASEN would partially cover these LCOE costs from the sale of plants' output to ONEE under a 25-year sale agreement at a price equivalent to ONEE's high voltage tariff. Revenues from MASEN's sales to ONEE are expected to be insufficient to fully cover MASEN's purchase costs. However, the net financial burden to the GoM from this revenue gap is expected to be far less than the estimated gross total amount of the gap between MASEN purchase price and sales price, as Noor-Midelt Phase 1 is expected to generate cash to GoM and MASEN through tax payments, return on equity and acceleration of depreciation.

41. A sensitivity analysis shows that, in the case of a lower capital expenditure by 20% (for both CSP and PV components), the need for a financial subsidy level to MASEN from GoM would disappear. Such scenario can be considered as possible given the recent cost reductions for both CSP and PV solar technologies.

B. Technical

42. The proposed AF consists of two hybrid PV/CSP power plants (Noor-Midelt I and Noor-Midelt II). The technology choice for the CSP plant section of either parabolic trough and or tower design is free for bidders to propose but must include thermal storage with molten salts. For the PV component, the bidder is also free to select the most cost-effective technology.

43. The site is well suited for solar projects because of its excellent solar resources for both Direct Normal Irradiance (DNI)[7] and Global Horizontal Irradiance (GHI). The energy will be delivered to ONEE national grid at the Noor-Midelt substation. For the two first plants of the solar complex the energy will be delivered in 225 kV. However, the 140-km transmission line from Noor-Midelt to El Ouali, as well as the rest of the infrastructure to transport the plant output, will be designed for 400 kV to upgrade the step-up transformation for the potential third and fourth complex plants (Phase 2). The Hassan II dam, with a capacity of 400 million m^3, and located just 14 km from the site, will supply the water to the complex. To minimize water consumption, the plants will be designed to use dry cooling, so the requirement for water will be reduced and each plant is not expected to require more than 220,000 m^3 (0.5 percent of annual dam volume).

44. Front-End Engineering and Design (FEED) to meet MASEN's minimum technical specifications will be carried out by the selected bidders who will construct, own, and operate the Noor-Midelt solar power plants. Both Phase 1 plants will be of solar hybrid CSP-PV configuration and will be designed, manufactured, installed, erected, operated and maintained in such a way that they will achieve high availability and reliability with minimum generation costs. The plants will follow environmentally sound practices and comply with the recommendations of the Framework Environmental and Social Impact Assessment (FESIA). Fuel and water consumption will be minimized for both plants. Fuel-burning equipment will be used only for auxiliary support functions (i.e., Plant start-up and safe operation). The project technical specifications will be reviewed by the donors' technical experts to ensure that all relevant construction and operational risks are adequately addressed.

45. Among the options available to the bidders for the CSP component, the parabolic trough choice is considered a proven and fully commercial technology, and the plant presents no unusual construction or operational challenges for a power plant of that size. Parabolic trough is the CSP technology with the most commercial operating experience. The solar tower technology is still an evolving technology with more limited operational record than parabolic trough due to the reduced number of projects under construction and operation; however, MASEN already has experience through the Noor-Ouarzazate III plant. Although the solar tower has higher capital costs than parabolic trough, the technology has important benefits that make it very attractive and potentially better than other CSP technologies: (i) higher conversion efficiency from solar thermal energy to electricity; (ii) molten salt towers have lower water consumption requirements; and (iii) greater potential for cost reduction and local manufacturing. These advantages are driving the increasing share of solar tower projects planned worldwide and according to several expert sources, solar towers might become the technology of choice in the future.

[7] Direct Normal Irradiance is 2359 kWh/m2 and Global Horizontal Irradiance is 2096 kWh/m2

46. The hybrid solution combines advantages of PV and CSP in the same plant and helps to mitigate the disadvantages of each technology. It considers the least-cost planning results, by providing a consistent, affordable production from PV, while CSP plants can optimize their output by increasing their solar multiple (i.e., increasing the size of the solar field) and using thermal storage to extend their operating hours into the evening when Morocco's electricity demand peaks. Thus, the combined technology yields a much higher capacity factor than PV plants alone at a much-reduced price than CSP plants alone. The hybrid plant, thanks to CSP generation, could also provide reserve capacity and other ancillary services to mitigate system regulation issues and imbalances caused by intermittent plants. The hybrid solution cannot be directly benchmarked internationally. At this time, there are no international experiences of this type of plant, and only one other project has been announced in Antofagasta (Chile) which is under development.

C. Financial Management

47. The fiduciary arrangements that have been put in place for the parent project Noor-Ouarzazate II and III will remain in place as they have been deemed satisfactory with no overdue audit report. They will apply to the new Component for financing the Noor-Midelt plants. The Project is expected to be implemented by one or more competitively selected private sector sponsors and the selected sponsors will form a special purpose company (SPC) that will design, construct, own, operate, and maintain the Noor-Midelt plants. The SPCs, which will be the Project Implementing Entities (PIE), will not be identified until after conclusion of the procurement process and award of Noor-Midelt plants. As such, appraisal of their accounting and management system is not possible until then. However, the CTF and IBRD loan agreements require, as a condition to disbursement, that the SPCs establish an accounting and financial management system acceptable to the World Bank. The same process that was used for the parent project will be used to approve and audit the SPCs set-up to develop and operate the Noor-Midelt plants.

D. Procurement

48. As per the requirements of World Bank procurement regulations, a Project Procurement Strategy for Development (PPSD) has been developed by MASEN, and the associated procurement plan was finalized during negotiation. These documents set out the selection methods to be followed by MASEN during implementation in procuring goods, works, non-consulting and consulting services financed by the Bank and CTF. The Procurement Plan will be updated at least annually, or as required, to reflect actual project implementation needs and improvements in institutional capacity.

49. A procurement capacity and risk assessment of the project has been carried out by the Bank and found the procurement risk to be "Substantial", given the complexity of the PPP structure of the project. It is an update of the previous assessment carried for the parent project. With regard to capacity building, the World Bank has conducted training on the new electronic management tool (Systematic Tracking of Exchanges in Procurement (STEP)) for MASEN's staff and on the World Bank's Procurement Regulations that came into effect in July 2016. The project will be subject to the Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD Loans and IDA Credits and Grants (Anti-Corruption Guidelines), dated October 15, 2006, and revised in January 2011 and as of July 1, 2016.

50. The Project's procurement consists of the competitive selection of private sector sponsor(s) for a partnership with MASEN to design, build, own, operate, and transfer the Noor-Midelt plants. The procurement process follows the World Bank's Procurement Regulations for Investment Project Financing (IPF) Borrowers, dated July 1, 2016. Once selected, the sponsors would then be free to procure goods, works, and consulting/non-consulting services required to implement the contemplated arrangement from eligible sources using the sponsors' own procedures.

51. The selection process of the private sector sponsors is underway and is conducted by MASEN under a three-stage process: after pre-qualifications, the first request for proposals (RfP1) was issued in the second quarter of 2017, and three bids were received on December 12, 2017. The evaluation report recommending acceptance of all three preliminary technical proposals was sent to IFIs for no-objection on March 10, 2018, and was cleared by the Bank's Operational Procurement Review Committee (OPRC) on May 11, 2018. The second stage request for proposals (RfP2) was sent to IFIs for no-objection on April 5, 2018 and is being analysed. As soon as RfP2 clearance is obtained from IFIs, it will be launched by MASEN, asking retained bidders for their final technical proposals and financial proposals within two months. Award of the two plants projects and signing of contracts are expected during the fourth quarter of 2018.

E. Social (including Safeguards)

52. *Employment:* It is expected that the project will create approximately 3800 full-time jobs for both plants and common infrastructure during the peak construction period, which will last up to two years per plant. Operation of the two solar power plants will require 200 to 300 workers (estimation based on the Noor Ouarzazate Solar Complex), including those to operate ancillary facilities. A significant proportion of the jobs will be hired locally, using the National Agency for Employment and Capacity Promotion (Agence Nationale de Promotion de l'Emploi et des Compétences - ANAPEC). The cooperation between ANAPEC and MASEN has already proven efficient and effective during the implementation of the solar projects in Ouarzazate. ANAPEC can hire locally, or using a larger national network for jobs for which skills are not available locally. Requirements on the management of labor, labor safety, relationships of employees with local populations, community health and safety regarding labor, will be included in bidding documents and contracts, following the standards set out in Performance Standard (PS) 2 and PS4. ANAPEC will ensure that hiring practices consider the specific needs of women and men in the project works area, specifically information about needed qualifications for women to obtain jobs in the CSP plant (if they so wish) and guidance on the kind of training and education they would need to be able to do so. The social/gender expert familiar with the restrictive norms and legal barriers that affect women's access to and participation in economic and skills-building opportunities will be hired by MASEN.

53. *Labor influx:* The settlement of non-local workers and their followers will be managed by the developer and the contractors following requirements that will be laid out in the Specific Environmental and Social Management Plans (ESMPs).[8] Implementation of these Specific Environmental and Social Management Plans (SESMPs) will be supervised by MASEN. It is expected that most of the non-local workers

[8] The ESMP will require mitigation measures to be included in the civil works contracts as well as a requiring a Workers code of conduct that includes a no tolerance policy for sexual intimidation, harassment and violence at project construction sites. (World Bank GBV Task Force, 2017).

will settle in Midelt, a provincial hub with an estimated population of approximately 55,000 (2012). Midelt has an existing tourism infrastructure that should be able to absorb most of the service requirements created by the influx of workers. MASEN will have to ensure that the settlement and service requirements of non-local workers benefit the local communities and the local economy, and does not interrupt the local communities around the site that possible negative impacts are mitigated, and that recourse in case of non-compliance is integrated into the management of the SESMPs.

54. *Stakeholder engagement:* MASEN has a voluntary Local Development Plan (LDP) for which the activities are established on an annual basis in close collaboration with the communities. MASEN is solely responsible for the implementation of its own LDP program and the project sponsors are responsible for their LDP program.[9] MASEN and project sponsors are committed to improve social and physical infrastructure for communities living close to the project footprint as part of their LDP. Local development strategies will be developed through needs assessment and communities' participation. The FESIA includes a description of MASEN's Stakeholder Engagement Plan (SEP), which is currently under preparation and will be finalized before the start of construction of Noor-Midelt plants, and the Grievance Redress Mechanism (GRM), including the names, email addresses and phone numbers of MASEN's local development contact staff where grievances can be delivered. The SEP will include a communications strategy to manage community expectations and elements of the voluntary CSR objectives of MASEN.

55. *Gender gap the project is addressing*: The ESMAP supported study on World Bank-ESMAP report on *Impacts of Electricity Infrastructure on Men and Women: The Case of Morocco's Ouarzazate CSP Plant (2017)* revealed that while there was an enthusiastic perception of the project among women, gaps in guidance to women and men on what it would take to obtain skilled jobs at the CSP plant and low levels of female employment on the site emerged as key issues. For example, 77 percent of women who participated in the focus group discussions were favorable toward the project. However, when it came to direct employment, women felt that they had little information about their job options at the CSP plant. In addition, the assessment showed that women did not have the sufficient skills for employment at the CSP plant, partly because of the challenge of overall educational/skill level in rural communities as well as around restrictive norms surrounding women's access to employment. By August 2015, only 53 of the 1251 workers hired at CSP plant were women. Despite their small share, women worked in a variety of technical and manual labor jobs from quality control (16 percent) and broad technical support (16 percent) to even welding (6 percent) hence demonstrating a potential for greater involvement in various aspects of the CSP plant. *Action:* The project will provide support to ANAPEC in guiding both women and men on how to get skilled work, as well as offer access to tailored skills-building trainings specific to the needs and level of women and men, based on their interest and relevance to CSP job market. Training will be carried out in a way to ensure that women can participate by ensuring these are held at an appropriate time as well as exploring provision of transport and childcare. Details of the exact nature of support to job recruits and training will be included in the Operational Manual. Among the PDO level results indicators, the direct project beneficiaries (number) will be measured, and particularly the percentage of which are female. Additionally, the project will measure: number of hired workers on the CSP site (target 1200), of which (target 120) female; share of female recruits receiving information on training and skilled work at the CSP plant (target 75 percent).

[9] Activities under the LDP are voluntary in nature and outside the Project scope, thus not covered by the Bank's supervision during implementation of the Project.

56. *Land, land-based livelihood, and land acquisition:* The proposed Noor-Midelt site is administratively located in the province of Midelt. The site is on the Haute Moulouya Plateau approximately 20 km north-east of the town of Midelt. The site is accessible from the Route Nationale RN13, which links Meknes with Midelt. The Noor-Midelt site has been selected for the following reasons: (i) the site has an excellent potential for solar power production; (ii) the site is close to the Hassan II Reservoir (11 km) for its water needs; (iii) there is a nearby electric transmission line; (iv) there is easy access through the RN13; (v) the site is very flat and favorable for a solar power plant; (vi) there are no people living on the site; (vii) the vegetation is sparse, hence the site is barely used for livestock grazing; (viii) environmental impacts and risks are minimal; (ix) there are no physical cultural resources within a radius of 3 km; and (x) the site is outside a natural zone and outside any protected tourist area.

57. The Noor-Midelt CSP Complex will be constructed on a lot of 3,150 hectares (ha) of land (expandable to 4,141 ha) 20 km north of the town of Midelt in northern Morocco. The site includes no settlements, shelter or housing, no ground attachments, and no livelihood or income-generating activities, as the land is too far from villages (the closest settlements are located at a distance of 7km), unfit for pastoral activities, and has no water supply. The major sources of livelihoods in the other settlements/villages outside the project footprint are subsistence agriculture and remittances from migrants. A total of 2714 ha is managed as communal land by the three ethnic communities of Ait Oufella, Ait Rahou Ouali, and Ait Massoud Ouali, while approximately 1427 ha is declared as forest land and currently managed by the communities. No physical displacement will be required, and no ground attachments have been found on the site. The sandy and arid terrain allow only for small scrubs to grow, and the land is not suitable for agricultural development due to lack of water. The land acquisition for the project will have no impacts on the livelihood of local communities. As the land has sparse vegetation, it is used only in a transitional manner for livestock grazing by transhumant non-local communities. Transhumance occurs only along the river crossing the site, along which a corridor will be kept open, which can be used for livestock.

58. MASEN had started the LAP through willing buyer – willing seller arrangements by negotiating rates for the land acquisition with the communities, and agreements on the cessation of ownership to MASEN and the price per hectare have been reached in early 2016. Until December 2017, the attribution of the compensation payments for the different plots constituting the site was contested in court between the local communities, the Water and Forest Administration, and individuals in the communities.[10] Given the legal contestation, MASEN started land acquisition through expropriation under the national laws and regulations. For the expropriation process, the compensation rates agreed upon during negotiations with the communities were used. As of December 2016, the full compensation payments have been transferred to an escrow account awaiting the outcomes of the court decision and their final attribution. The expropriation was granted in favor of MASEN by the administrative court decision in January 2017, and the court decision was publicly disclosed in March 2017. MASEN is therefore the undisputed owner of the land for the project sites. Cadastral registration in the name of MASEN for five plots has been finalized as of December 2017.

59. ONEE, as the national power and water utility, will construct the 140 km 400 kV transmission line to connect the Noor-Midelt complex to the national grid. The line will be going from an evacuation post at the Midelt I and II Plant Site, across the mountain range of the Middle Atlas, to the El Ouali transformer station

10 A resolution of the court cases with regards to the distribution of the compensation payments is expected in the first trimester of 2018, but may take longer.

between Fez and Taza. The LAP for the acquisition of private and communal land for the Transmission Line-site (Transmission Line-site LAP), which is an associated facility, is currently under preparation by ONEE (the utility responsible for construction and operation of the transmission line), as the detailed design and corridor for the transmission line are still under preparation, and will to be submitted to the Bank for approval and publication before the start of the line's construction. The Transmission Line-site LAP will include a baseline of land and economic activities, consultation mechanisms, a GRM, description of compensation standards and source and utilization of funds, and the other elements required. The Transmission Line-site LAP will not allow civil works on sites that have not been properly compensated under the LAP. Implementation, monitoring, and reporting on the Transmission Line-site LAP are included in the Environmental and Social Assessment Plan (ESAP) as requirements.

60. MASEN prepared three due diligence documents for land acquisition titled 'Land Acquisition Plan' (LAPs): a Midelt I and Midelt II plants-site LAP (LAP 1) dated July 2017 and disclosed in-country on MASEN's website in August 2017; an Access Road-site LAP (LAP 2) dated July 2016 and disclosed in-country on MASEN's website in September 2016; and a Water Pipeline-site LAP (LAP 3), dated July 2017 and disclosed in-country on MASEN's website in August 2017; all were disclosed on the World Bank website on October 17, 2017. Social and economic surveys were carried out during the preparation of LAP 1, 2, and 3 to establish a baseline data. No land acquisition is required for LAP 3, and LAP 2 requires land exchanges with the Department of Forest.

F. Environment (including Safeguards)

61. For the parent project the World Bank Safeguards Policies apply. For the AF and the Midelt sites the World Bank Performance Standards apply. For the 180 km and 400 kV associated transmission line constructed and operated by ONEE the World Bank Safeguard Policies apply. In addition, the General Environmental, Health and Safety Guidelines (HSE) and the HSE for Thermal Power and for Electric Power Transmission and Distribution of April 2007 will also apply.

62. Environmental impacts and mitigation measures: The Project has limited environmental impacts, especially considering the size of the power plants to be constructed. It should be noted that, as a renewable energy facility, the environmental impacts of the underlying solar facilities are significantly lower than an alternative conventional thermal power plant. Most importantly, the Project will reduce air pollution as it is not emitting GHGs or other local pollutants. The project avoids about 1 million ton of CO2 equivalent per year. The potential environmental risks and impacts in the Project's area of influence are:

- **Impacts on Soil, Water and Air and Noise Pollution**: Construction of Noor-Midelt facilities on such large areas of land will require grading, and results in soil compaction, potential alteration of drainage channels, and increased runoff and erosion. Engineering methods will be used to mitigate these impacts. Since there is almost no vegetation, the impacts on natural ecosystems will be minimal. The power plants will be air cooled, so that water use of Phase 1 is only 0.5 percent of the annual inflow of the Hassan II Dam. Water is mainly used for cleaning the mirrors, drinking water, sanitation of the office building and make-up for steam production. The main uses of the water of the Hassan II dam is for irrigation and drinking water. The Project will have no noticeable impacts on these main functions. Impacts on water quality will be minimal. A

KfW-funded study is ongoing to assess the impacts of climate change on water availability. The results of this study will determine if there is a need for a change in the water resources management. There will be very limited air pollution during construction, mostly dust, and almost no air pollution during operation. Noise levels during construction and operation will be within international standards. The main risks are the health and safety risks during construction and the adequate implementation of the Environmental and Social Management System (ESMS) and CESMPs by the developers and contractors.

- **Ecological Impacts:** The use of large areas of land for the Noor-Midelt solar power facilities will adversely affect native vegetation and wildlife in many ways, including loss of habitat; interference with rainfall and drainage; and potential direct contact causing injury or death (flying birds). These potential impacts on the avifauna will be evaluated and documented in the Specific-Environmental and Social Impact Assessments (SESIAs) for each technology, and mitigation measures will be proposed. However, according to Smit Hanneline[11], the following actions should be taken to mitigate negative impacts on birds: (i) pre-construction monitoring to determine the presence of 'threatened, rare, endemic' bird species (the FESIA states that there is one vulnerable and one threatened bird species present in the wider project area); (ii) monitoring should take into account seasonal variation, fly paths and birds' behavior; (iii) during construction the position and height of the receiver tower should be taken into account at the CSP plant with a central receiver on top of the tower; (iv) ensure that birds do not get in contact with evaporation ponds, i.e., ponds should be covered with wire mesh or netting, if needed to reduce the possibilities of attracting birds. Where needed, the new power lines will be marked with anti-bird collision devises and bird-friendly designs will be used to prevent electrocution.

- **Particulate Matter:** The construction of Noor-Midelt facilities generates particulate matter in the form of dust, which can be a significant hazard, especially for workers during windy conditions. Regular watering of the vehicles and trucks itinerary paths at the construction sites will be undertaken regularly as a mitigation measure to minimize dust pollution.

- **Risk of Toxic Fluid Leaks:** The CSP in Noor-Midelt will employ molten salts, hydraulic fluids, coolants, and lubricants that may be hazardous and present spill risks. Proper planning and good maintenance practices will be used to minimize impacts from these hazardous materials. To prevent hazardous and presence of spill and leak risks, tubing and specialized equipment and materials will be used to prevent cracking and corrosion. This mitigation measures will also involve the use of flanges, gaskets, pumps and pump seals, security valves to reduce emissions and leaks, and containment pits to minimize accidental spread of molten salts.

63. Among the key mitigation measures are the Project's safety and security protocols. The Project incorporates worker safety and security measures to mitigate the use and manage the impacts of hazardous materials (molten salts, fossil fuel, etc.), fire hazards and other soil pollution on the environment and human health. To ensure that plant facilities comply with the international standards to provide worker health and safety and protect the environment, personnel specializing in health, safety, environmental protection will permanently monitor the adequate implementation of the Health and Safety Plans and SESMPs of these

[11] BirdLife in South Africa: Guidelines to minimize the impact on birds of Solar Facilities and Associated Infrastructure in South Africa (http://www.the-eis.com/data/literature/Solar%20guidelines_version2.pdf)

complex's facilities and report all incidents that may occur during construction and operation of Noor-Midelt power plants to MASEN.

64. The Project's associated facility, which is the 400 kV transmission line operated in Phase 1 at 225 kV under the responsibility of ONEE, has potential environmental and social impacts, which include land disturbance/land use impacts; impacts to soil, water and air resources; impacts to wildlife, especially birds; visual, socioeconomic and environmental impacts. ONEE is preparing an Environmental and Social Impact Assessment (ESIA), which will include an environmental and social management plan, for this transmission line, which will be submitted for Bank approval before start of construction of the line.

65. Safeguards documentation. The FESIA covers all of the Noor-Midelt solar power sites and the different solar technologies (CSP parabolic trough, solar tower, PV and PV concentrated) under consideration by MASEN. The FESIA was prepared in a participatory manner including all required stakeholder consultation; it was approved by the Bank and disclosed in country and on the Bank's website on November 30, 2017. Stakeholders were provided a non-technical summary of the FESIA some days before the public consultation meeting. The FESIA includes a description of: (i) the legal and regulatory framework applicable to the plants, (ii) applicable IFI environmental and social, health and safety policies, alternative options considered, (iii) a state of the environment at the plants' location and surrounding region, (iv) potential impacts and associated compensation measures to be considered, and (v) a Framework Environmental and Social Management Plan (FESMP). The FESMP includes institutional settings, general mitigations measures, monitoring plan and responsibilities for the mitigation and management of the potential impacts from the plant's activities during construction and operation. The FESMP will be used for the construction and operation of the common infrastructure: upgrading of the access road, a bridge, water intake, water pipeline, and raw water treatment plant. A separate Stakeholder Engagement Plan (SEP) is currently under preparation to guide MASEN and the contractors' engagement with communities. The SEP will be shared with the Bank and approved by MASEN prior to the start of construction, and implemented by MASEN throughout project execution.

66. The FESIA will guide the preparation, adoption, implementation and monitoring of the SESIAs for each adopted solar technology, which, as noted above, are to be prepared and implemented by the bidders for each of the solar power plants located on the Noor-Midelt site, once their initial designs are determined. The SESIAs will include a detailed CESMP in accordance with the provisions of the FESIA, including the processes, rules and standards defined in the FESIA, and will be subject to the Bank's review and concurrence before its final approval, disclosure and implementation by MASEN and the Developer. The Developers and Contractors will carry out public consultations on the SESIAs and CESMPs. These requirements will be included in their terms of reference and contracts. The developers will also prepare and implement an ESMS for construction and operation consistent with PS1. The ESMS is the leading management system, of which the CESMPs are an integrated part.

67. After the SESIAs' review and disclosure in-country and on the Bank's website before start of construction, the developer is expected to contract experienced environmental and social safeguards, as well as health and safety, coordinators, with international project experience that will have direct responsibility for implementing the agreed HSE measures at the Midelt plants' site during construction and operation. The health and safety staff need to be certified under the OHSAS 18001:2007 standards or equivalent. These coordinators will, among others, prepare a monthly HSE report during the construction

and operation phases of Noor-Midelt, and MASEN will provide a summary of this information for the Bank's review during the supervision phase of the proposed Project.

68. Regarding the associated power transmission line to connect the plants to the national grid, an ESIA/ESMP and LAP are under preparation by ONEE, with a target completion allowing for approval by the Bank before Board submission. The Bank will ensure that the ESIA and LAP are consistent with the World Bank Safeguards Policies.

69. Climate and disaster risk screening for the project has been carried out. The screening considered different types of infrastructure of the project: (i) CSP power plants; (ii) PV power plants; (iii) transmission line. The climate and disaster risk screening identified that the exposure to climate and geophysical hazards in the Midelt plants are likely to be moderate and limited to reduced precipitation, causing a lower availability of water and droughts, and low for elevated temperatures causing strong winds. The CSP and PV power plants work more efficiently in an environmental with more daily sun hours and higher temperatures. Droughts in the project area will reduce the cloud cover, which will increase power production. The design of the CSP power plants has taken lower water consumption into account by making the power plants air cooled. The total water consumption during operation of the Phase 1 of the solar power project will be less than 0.5 percent of the present annual water inflow into the Hassan II Dam. Increased temperatures coupled with declining and increasingly erratic rainfall may lead to increased drought conditions. Lower mountain snowfall and, consequently, increased stream flow variability will also contribute to less water availability. Drought frequency and intensity have increased in recent decades and are projected to worsen with climate change. Extended meteorological droughts in the Middle Atlas Mountains of Morocco, namely the Oum er-Rbia watershed, have severely affected water availability. A similar trend is expected in the Midelt project area. The project will only be seriously affected if the Annual Water Inflow in the Hassan II Reservoir approaches zero. The total climate co-benefits in this project amount to US$100 million (100 percent), all related to climate change mitigation and none to adaptation.

G. Other Safeguard Policies (if applicable)

70. The main project applies World Bank Performance Standards under OP 4.03, while the ONEE transmission line will apply World Bank Safeguard Policies. The applicable Safeguard Policies are OP 4.01 on Environmental Assessment and OP 4.12 on Involuntary Resettlement. The Dam Safety of the Hassan II Dam, which is related to the main project, is managed under PS4.

V. WORLD BANK GRIEVANCE REDRESS

71. Communities and individuals who believe that they are adversely affected as a result of a Bank supported operation, as defined by the applicable policy and procedures, may submit complaints to the existing program grievance redress mechanism or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address pertinent concerns. Affected communities and individuals may submit their complaint to the WB's independent Inspection Panel which

determines whether harm occurred, or could occur, as a result of WB non-compliance with its policies and procedures. Complaints may be submitted at any time after concerns have been brought directly to the World Bank's attention, and Bank Management has been given an opportunity to respond. For information on how to submit complaints to the World Bank's corporate Grievance Redress Service (GRS), please visit http://www.worldbank.org/GRS. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

72. Morocco has numerous institutions responsible for hearings and grievance redress. The existence of grievance and appeal mechanisms and their recent promotion at the constitutional level give them the necessary independence and financial autonomy, and reinforce their power of self-referral. The World Bank's corporate Grievance Redress Service does not affect the solidity of the Moroccan grievance redress system.

VI. SUMMARY TABLE OF CHANGES

	Changed	Not Changed
Change in Project's Development Objectives	✓	
Change in Results Framework	✓	
Change in Components and Cost	✓	
Change in Loan Closing Date(s)	✓	
Reallocation between Disbursement Categories	✓	
Change in Disbursements Arrangements	✓	
Change in Safeguard Policies Triggered	✓	
Change in Implementing Agency		✓
Cancellations Proposed		✓
Change of EA category		✓
Change in Legal Covenants		✓
Change in Institutional Arrangements		✓
Change in Financial Management		✓
Change in Procurement		✓
Other Change(s)		✓

VII. DETAILED CHANGE(S)

PROJECT DEVELOPMENT OBJECTIVE

Current PDO

The PDO is to increase (a) installed capacity (megawatt) and (b) electricity output (megawatt-hour), especially during peak hours, of the Noor-Ouarzazate Solar Complex.

Proposed New PDO

The PDO is to increase innovative solar power generation in Morocco.

RESULTS FRAMEWORK

Project Development Objective Indicators

Generation Capacity of Renewable Energy (other than hydropower) constructed
Unit of Measure: Megawatt
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	250.00	Marked for Deletion
Date	30-Jun-2014	30-Dec-2016	30-Jun-2019	

Generation Capacity of Renewable Energy constructed-Solar
Unit of Measure: Megawatt
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	250.00	Marked for Deletion
Date	30-Jun-2014	30-Dec-2016	30-Jun-2019	

Progress of construction of Noor II
Unit of Measure: Percentage
Indicator Type: Custom Supplement

	Baseline	Actual (Current)	End Target	Action
Value	0.00	76.00	100.00	Marked for Deletion

Progress of construction of Noor III
Unit of Measure: Percentage
Indicator Type: Custom Supplement

	Baseline	Actual (Current)	End Target	Action
Value	0.00	73.70	100.00	Marked for Deletion

Noor Solar Projects Electricity Sales (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	400.00	2,624.00	Revised
Date	30-Jun-2014	30-Dec-2016	30-Dec-2022	

Noor Solar Projects Electricity Sales – Ouarzazate Complex (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	400.00	1,300.00	New
Date	31-Dec-2014	30-Dec-2016	30-Dec-2022	

Noor Solar Projects Electricity Sales – Midelt Complex (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	1,324.00	New
Date	30-Nov-2017	30-Dec-2016	30-Dec-2022	

Noor Solar Projects Electricity Sales during peak hours (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	84.00	870.00	Revised

Date	30-Jun-2014	30-Dec-2016	30-Dec-2022	

Noor Solar Projects Electricity Sales during peak hours – Ouarzazate Complex (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	84.00	540.00	New
Date	30-Jun-2014	30-Dec-2016	30-Dec-2022	

Noor Solar Projects Electricity Sales during peak hours – Midelt Complex (GWh)
Unit of Measure: Gigawatt-hour (GWh)
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	330.00	New
Date	13-Nov-2017	13-Nov-2017	30-Dec-2022	

Avoided global GHG pollution
Unit of Measure: Tones/year
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	209,174.00	1,270,000.00	Revised
Date	30-Jun-2014	30-Dec-2016	30-Dec-2022	

People provided with new or improved electricity service
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	347,782.00	2,200,000.00	Revised
Date	30-Jun-2014	30-Dec-2016	30-Dec-2022	

Female beneficiaries
Unit of Measure: Percentage
Indicator Type: Custom Supplement

	Baseline	Actual (Current)	End Target	Action
Value	0.00	50.30	50.30	Revised

Intermediate Indicators

Transaction financial close
Unit of Measure: Yes/No
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	No	Yes	Yes	Marked for Deletion
Date	30-Jun-2014	22-May-2015	30-Jun-2019	

Private Capital Mobilized
Unit of Measure: Amount(USD)
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	75,000,000.00	597,000,000.00	Revised
Date	30-Jun-2014	31-Dec-2015	30-Dec-2022	

Beginning construction of the plant
Unit of Measure: Yes/No
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	No	Yes	Yes	Marked for Deletion
Date	30-Jun-2014	31-Jul-2015	30-Jun-2019	

Commissioning of the plant
Unit of Measure: Yes/No
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	No	No	Yes	Marked for Deletion
Date	30-Jun-2014	30-Jun-2016	30-Jun-2019	

Generation capacity of energy constructed or rehabilitated
Unit of Measure: Megawatt
Indicator Type: Core

	Baseline	Actual (Current)	End Target	Action
Value	0.00	160.00	1,310.00	New
Date	30-Jun-2014	13-Nov-2017	30-Dec-2022	

Renewable energy generation capacity (other than hydropower) constructed under the project
Unit of Measure: Megawatt
Indicator Type: Core Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	160.00	1,310.00	New
Date	30-Jun-2014	13-Nov-2017	30-Dec-2022	

Noor Ouarzazate I Capacity constructed
Unit of Measure: Megawatt
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	160.00	160.00	New
Date	30-Jun-2014	13-Nov-2017	30-Dec-2022	

Noor Ouarzazate II and III Capacity constructed
Unit of Measure: Megawatt
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	350.00	New
Date	30-Jun-2014	13-Nov-2017	30-Dec-2022	

Noor Midelt Phase I Capacity constructed
Unit of Measure: Megawatt
Indicator Type: Custom Breakdown

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	800.00	New
Date	13-Nov-2017	13-Nov-2017	30-Dec-2022	

Progress of Overall Construction - Noor Ouarzazate II
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	90.50	100.00	New
Date	13-Nov-2017	30-Jun-2017	30-Dec-2022	

Progress of Overall Construction - Noor Ouarzazate III
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	89.90	100.00	New
Date	30-Jun-2014	30-Jun-2017	30-Dec-2022	

Progress of Overall Construction - Noor Midelt Phase I
Unit of Measure: Amount(USD)
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	100.00	New
Date	13-Nov-2017	18-Apr-2018	30-Dec-2022	

Grievances registered related to delivery of project benefits addressed
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	100.00	New
Date	23-Nov-2017	18-Apr-2018	30-Dec-2022	

Share of female job-recruits receiving information on training and skilled work in the Noor Midelt Phase I project
Unit of Measure: Percentage
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	75.00	New
Date	18-Apr-2018	18-Apr-2018	30-Dec-2022	

Number of hired workers on the CSP site
Unit of Measure: Number
Indicator Type: Custom

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	1,200.00	New
Date	18-Apr-2018	18-Apr-2018	30-Dec-2022	

of which female
Unit of Measure: Number
Indicator Type: Custom Supplement

	Baseline	Actual (Current)	End Target	Action
Value	0.00	0.00	120.00	New

COMPONENTS

Current Component Name	Current Cost (US$, millions)	Action	Proposed Component Name	Proposed Cost (US$, millions)
Component 1- Financing for the Initial Investment	2,377.00	Revised	Component 1 - Noor-Ouarzazate Project Investment	2,377.00
Component 2- Cost Mitigation Mechanism	299.00	Revised	Component 2- Noor-Ouarzazate Cost Mitigation Mechanism	199.00
	0.00	New	Component 3- Noor-Midelt Project Investment	2,200.00
TOTAL	**2,676.00**			**4,776.00**

LOAN CLOSING DATE(S)

Ln/Cr/Tf	Status	Original Closing	Current Closing(s)	Proposed Closing	Proposed Deadline for Withdrawal Applications
IBRD-84400	Effective	30-Jun-2020	30-Jun-2020	30-Dec-2022	30-Apr-2023
TF-17509	Effective	30-Jun-2020	30-Jun-2020	30-Dec-2022	30-Apr-2023

REALLOCATION BETWEEN DISBURSEMENT CATEGORIES

Current Allocation	Actuals + Committed	Proposed Allocation	Financing % (Type Total)	
			Current	Proposed

IBRD-84400-001 | Currency: EUR				
iLap Category Sequence No: 1	Current Expenditure Category: GD; WRK;NON CS; PART 1.A of project			
58,606,000.00	40,569,276.00	58,606,000.00		15.20
iLap Category Sequence No: 2	Current Expenditure Category: GD; WRK;NON CS; PART 3			
0.00	0.00	0.00		100.00
iLap Category Sequence No: 3	Current Expenditure Category: Purchase Electricity PART2A, 2B and 2C of Project			
54,993,000.00	12,049,508.00	142,607,750.00	100.00	100.00
iLap Category Sequence No: 4	Current Expenditure Category: Intentionally blank			
71,276,000.00	0.00	0.00	100.00	100.00
iLap Category Sequence No: 5	Current Expenditure Category: Intentionally blank			
25,597,000.00	0.00	0.00	100.00	100.00
iLap Category Sequence No: 6	Current Expenditure Category: Intentionally blank			
23,441,750.00	0.00	0.00		
iLap Category Sequence No: 7	Current Expenditure Category: Unallocated			
0.00	0.00	0.00		100.00
iLap Category Sequence No: 8A	Current Expenditure Category: Goods, works and non-consulting services for Part 3.A of the Project			
0.00	0.00	16,350,000.00		6.00
iLap Category Sequence No: 8B	Current Expenditure Category: Goods, works and non-consulting services for Part 3.B of the Project			
0.00	0.00	16,350,000.00		6.00

Total	**233,913,750.00**	**52,618,784.00**	**233,913,750.00**		
IBRD-84400-002 | Currency: USD					
iLap Category Sequence No: 1		Current Expenditure Category: GD; WRK;NON CS; PART 1.A of project			
20,000,000.00		18,832,408.41	20,000,000.00		100.00
iLap Category Sequence No: 2		Current Expenditure Category: GD; WRK;NON CS; PART 3 of project			
0.00		0.00	0.00		100.00
iLap Category Sequence No: 3		Current Expenditure Category: Purchase Electricity PART2A, 2B and 2C of Project			
18,767,000.00		0.00	0.00	100.00	100.00
iLap Category Sequence No: 4		Current Expenditure Category: Intentionally blank			
24,324,000.00		0.00	0.00	100.00	100.00
iLap Category Sequence No: 5		Current Expenditure Category: Intentionally blank			
8,709,000.00		0.00	0.00	100.00	100.00
iLap Category Sequence No: 6		Current Expenditure Category: Intentioanlly blank			
8,000,000.00		0.00	0.00		
iLap Category Sequence No: 7		Current Expenditure Category: Unallocated			
0.00		0.00	0.00		100.00
iLap Category Sequence No: 8A		Current Expenditure Category: Goods, works and non-consulting services for Part 3.A of the Project			
0.00		0.00	29,900,000.00		6.00
iLap Category Sequence No: 8B		Current Expenditure Category: Goods, works and non-consulting services for Part 3.B of the Project			

	0.00	0.00	29,900,000.00		6.00
Total	**79,800,000.00**	**18,832,408.41**	**79,800,000.00**		

TF-17509-001 | Currency: USD

iLap Category Sequence No: 1		Current Expenditure Category: GD; WRK;NON CS; PART 1.A of project			
	68,000,000.00	68,000,000.00	68,000,000.00	28.40	28.40
iLap Category Sequence No: 2		Current Expenditure Category: GD; WRK;NON CS; PART 1.C of project			
	51,000,000.00	51,000,000.00	51,000,000.00	28.30	28.30
Total	**119,000,000.00**	**119,000,000.00**	**119,000,000.00**		

DISBURSEMENT ARRANGEMENTS

Change in Disbursement Arrangements

Yes

Expected Disbursements (in US$, millions)

Fiscal Year	2015	2016	2017	2018	2019	2020	2021	2022	2023
Annual	0.00	51.26	17.57	39.83	59.04	97.35	132.48	77.48	25.00
Cumulative	0.00	51.26	68.82	108.65	167.69	265.04	397.52	475.00	500.00

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Latest ISR Rating	Current Rating
Political and Governance	Moderate	Moderate
Macroeconomic	Moderate	Moderate
Sector Strategies and Policies	Substantial	Substantial
Technical Design of Project or Program	Substantial	Substantial
Institutional Capacity for Implementation and Sustainability	Moderate	Moderate

Fiduciary	Moderate	Substantial
Environment and Social	Moderate	Substantial
Stakeholders	Moderate	Moderate
Other		Substantial
Overall	Substantial	Substantial

COMPLIANCE

Change in Safeguard Policies Triggered

Yes

Safeguard Policies Triggered	Current	Proposed
Environmental Assessment OP/BP 4.01	Yes	Yes
Performance Standards for Private Sector Activities OP/BP 4.03	No	No
Natural Habitats OP/BP 4.04	No	No
Forests OP/BP 4.36	No	No
Pest Management OP 4.09	No	No
Physical Cultural Resources OP/BP 4.11	No	No
Indigenous Peoples OP/BP 4.10	No	No
Involuntary Resettlement OP/BP 4.12	Yes	Yes
Safety of Dams OP/BP 4.37	Yes	Yes
Projects on International Waterways OP/BP 7.50	No	No
Projects in Disputed Areas OP/BP 7.60	No	No

LEGAL COVENANTS – Morocco - Noor Solar Power Project Additional Financing (P164288)

Sections and Description
Effectiveness of both the IBRD and CTF loan agreements are conditioned on the standard conditions of cross-effectiveness of both IBRD and CTF loan agreements. The Guarantee Agreements are effective once the Guarantor informs the Bank of the issuance of related decrees for each agreement. First disbursement is conditioned upon meeting a list of conditions that would ensure the PIEs ability to implement the Project. These include, but not limited to, execution and effectiveness of all key project agreements with the competitively-selected project entities that will design, construct, own, and operate the plants; ensuring that the PIEs have been legally formed and are authorized to operate in Morocco; adoption of a governance framework and a financial management and disbursement manual satisfactory to the Bank; legal opinions as to the validity and enforceability of key legal agreements between the Borrower and the PIEs; etc. The Borrower is also required to hire an independent verification expert to undertake technical audits of implementation of the two plants and achievement of agreed milestones and compliance of pricing provisions of the construction contracts.

Conditions

VIII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY : Morocco

Morocco - Noor Solar Power Project Additional Financing

Project Development Objectives

The PDO is to increase innovative solar power generation in Morocco.

Project Development Objective Indicators

Action	Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source / Methodology	Responsibility for Data Collection
Revised	Name: Noor Solar Projects Electricity Sales (GWh)		Gigawatt-hour (GWh)	0.00	2,624.00	MASEN	MASEN	Semi-Annually
New	Noor Solar Projects Electricity Sales – Ouarzazate Complex (GWh)		Gigawatt-hour (GWh)	0.00	1,300.00			
New	Noor Solar Projects Electricity Sales – Midelt Complex (GWh)		Gigawatt-hour (GWh)	0.00	1,324.00			
Description: Data collected on an annual basis								

Revised	**Name:** Noor Solar Projects Electricity Sales during peak hours (GWh)		Gigawatt-hour (GWh)	0.00	870.00	MASEN	MASEN report	Semi-Annually
New	Noor Solar Projects Electricity Sales during peak hours – Ouarzazate Complex (GWh)		Gigawatt-hour (GWh)	0.00	540.00			
New	Noor Solar Projects Electricity Sales during peak hours – Midelt Complex (GWh)		Gigawatt-hour (GWh)	0.00	330.00			
Description: Data collected on an annual basis								
Revised	**Name:** Avoided global GHG pollution		Tones/year	0.00	1,270,000.00	MASEN	MASEN	Annual after plant commissioning

Description: Estimate of avoided CO2, based on various fuel used (oil, coal, gas)

Based on emissions rates of 0.64 tons of CO2 eq./year for Noor-Ouarzazate I and 0.45 tons of CO2 eq./year for Noor-Ouarzazate II and III (Source: Parent Project's PAD, p42). ONEE has yet to complete a comparable set of model runs for the Midelt solar projects, but it may be expected that Midelt will displace mainly gas-based CCGTs and some coal, as for Noor II&III (source: Economic Analysis v2.2, Peter Meier). The Project Team will use same emission rate for Noor Midelt than Noor II and III (i.e. 0.45 tons of CO2 eq).

Revised	**Name:** People provided with new or improved electricity service		Number	0.00	2,200,000.00	MASEN	MEMEE and planning department	Annual after plant commissioning
Revised	Female beneficiaries		Percentage	0.00	50.30			
Description: Direct beneficiaries are people or groups who directly derive benefits from an intervention (i.e., children who benefit from an immunization program; families that have a new piped water connection). Please note that this indicator requires supplemental information. Supplemental Value: Female beneficiaries (percentage). Based on the assessment and definition of direct project beneficiaries, specify what proportion of the direct project beneficiaries are female. This indicator is calculated as a percentage.								

Intermediate Results Indicators

Action	Indicator Name	Core	Unit of Measure	Baseline	End Target	Frequency	Data Source / Methodology	Responsibility for Data Collection
Revised	**Name:** Private Capital Mobilized		Amount(USD)	0.00	597,000,000.00	MASEN	MASEN	Once at project's financial close. The term "Financial close" is defined for purposes of this document as signature of all debt and equity legal agreements

								that provides for the requisite funding for the Noor II and III, and satisfaction or waiver of all conditions to the effectiveness of these agreements and to the right to make drawdowns.
Description: The core indicator track the amount of direct financing (in the form of equity and/or debt) mobilized by private entities, using private funding, to finance investments within an IBRD/IDA operation or investments (PE, GE, RE, SF, and GU) directly linked to that operation.								
New	**Name:** Generation capacity of energy constructed or rehabilitated	✓	Megawatt	0.00	1,310.00			
New	Renewable energy generation capacity (other than hydropower) constructed under the project	✓	Megawatt	0.00	1,310.00			
New	Noor Ouarzazate I Capacity		Megawatt	0.00	160.00			

	constructed							
New	Noor Ouarzazate II and III Capacity constructed		Megawatt	0.00	350.00			
New	Noor Midelt Phase I Capacity constructed		Megawatt	0.00	800.00			
Description:								
New	**Name:** Progress of Overall Construction - Noor Ouarzazate II		Percentage	0.00	100.00			
Description:								
New	**Name:** Progress of Overall Construction - Noor Ouarzazate III		Percentage	0.00	100.00			
Description:								
New	**Name:** Progress of Overall Construction - Noor Midelt Phase I		Amount(USD)	0.00	100.00			
Description:								
New	**Name:** Grievances registered related to delivery of project benefits addressed		Percentage	0.00	100.00			
Description:								

New	**Name:** Share of female job-recruits receiving information on training and skilled work in the Noor Midelt Phase I project		Percentage	0.00	75.00			
Description:								
New	**Name:** Number of hired workers on the CSP site		Number	0.00	1,200.00			
New	of which female		Number	0.00	120.00			
Description:								

Target Values

Project Development Objective Indicators

Action	Indicator Name	End Target
Revised	Noor Solar Projects Electricity Sales (GWh)	2,624.00
New	Noor Solar Projects Electricity Sales – Ouarzazate Complex (GWh)	1,300.00
New	Noor Solar Projects Electricity Sales – Midelt Complex (GWh)	1,324.00
Revised	Noor Solar Projects Electricity Sales during peak hours (GWh)	870.00
New	Noor Solar Projects Electricity Sales during peak hours – Ouarzazate Complex (GWh)	540.00
New	Noor Solar Projects Electricity Sales during peak hours – Midelt Complex (GWh)	330.00
Revised	Avoided global GHG pollution	1,270,000.00
Revised	People provided with new or improved electricity service	2,200,000.00
Revised	Female beneficiaries	50.30

Intermediate Results Indicators

Action	Indicator Name	End Target
Revised	Private Capital Mobilized	597,000,000.00
New	Generation capacity of energy constructed or rehabilitated	1,310.00
New	Renewable energy generation capacity (other than hydropower) constructed under the project	1,310.00

New	Noor Ouarzazate I Capacity constructed	160.00
New	Noor Ouarzazate II and III Capacity constructed	350.00
New	Noor Midelt Phase I Capacity constructed	800.00
New	Progress of Overall Construction - Noor Ouarzazate II	100.00
New	Progress of Overall Construction - Noor Ouarzazate III	100.00
New	Progress of Overall Construction - Noor Midelt Phase I	100.00
New	Grievances registered related to delivery of project benefits addressed	100.00
New	Share of female job-recruits receiving information on training and skilled work in the Noor Midelt Phase I project	75.00
New	Number of hired workers on the CSP site	1,200.00
New	of which female	120.00

ANNEX 1: DETAILED PROJECT DESCRIPTION AND TECHNICAL APPRAISAL OF THE AF

I. Overview

1. The AF will support MASEN's implementation of the first phase of the Noor-Midelt Solar Power Complex with an estimated gross generation capacity between 600 and 800 MW. This first phase consists of two hybrid PV/CSP power plants (Noor-Midelt I and Noor-Midelt II) with a gross capacity between 300 and 400 MW each. The plants will include between 150 MW and 190 MW each of CSP gross capacity and a minimum of 5 hours of thermal storage capacity. Additional battery storage is also allowed as an option. Both plants will be constructed on adjacent lots that have already been acquired by MASEN. The second phase of the Noor-Midelt solar power complex will consist on two additional plants of similar characteristics built in adjacent lots.

2. The Noor-Midelt CSP Complex will be constructed on a lot of 3,150 hectares (ha) of land (expandable to 4,141 ha) 20 km north of the town of Midelt in northern Morocco. The complex will be located in the high plains surrounding the Moulouya River, between the Middle and High Atlas mountains. The location was selected on the basis of detailed solar resources mapping studies that helped to identify sites meeting certain selection criteria such as land availability, proximity to infrastructure and solar irradiance. In addition, meteorological, hydrological data were collected and topography, seismicity and the results of geotechnical assessments were taken into account in order to select the final site location. The site has good DNI in excess of 2,300 kWh/m2/year and access to water resources and key infrastructures, such as grid connections and roads. Land acquisition is nearly completed, and a framework environmental and social impact assessment (FESIA) has been prepared and approved by the government.

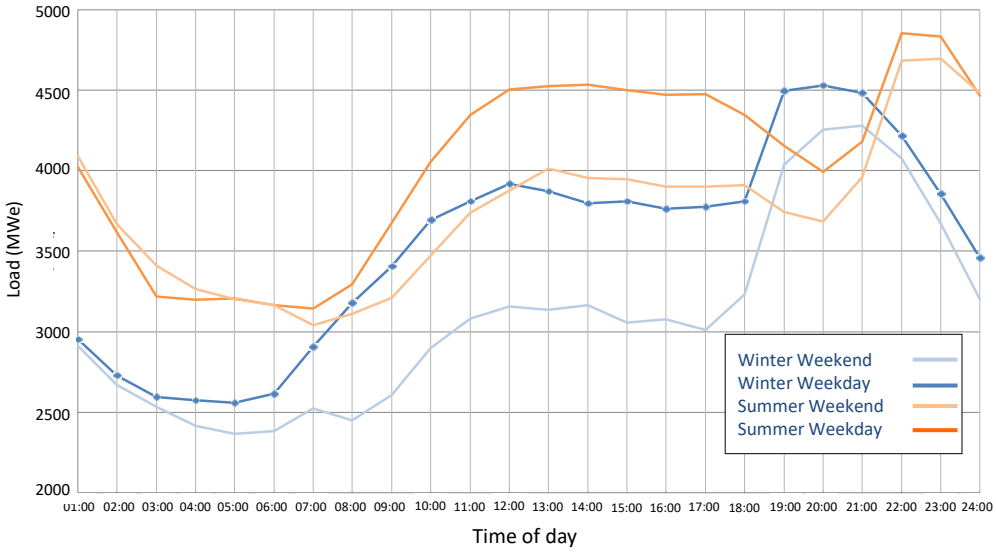
3. MASEN elected to pursue an innovative hybrid PV/CSP plant design to combine the benefits of both technologies to deliver firm power to the grid. The feasibility study indicates that this type of hybridization is an attractive solution as it increases the capacity factor and reduces output variability, compared to pure PV solutions. At the same time, it also reduces upfront investment cost per MW installed and the levelized cost of energy (LCOE), compared to pure CSP power plants.

4. The capacities of the PV and the CSP components are to be proposed by the bidders according to plant and energy cost optimization that must comply with certain restrictions to match a certain supply curve provided by MASEN. The CSP component technology might be based on synthetic oil parabolic trough with storage or a molten salt tower with storage. The selection of the CSP technology is also expected to be optimized by the bidders in order to maximize the plant performance.

II. Rationale for the hybrid solution in the Noor-Midelt project

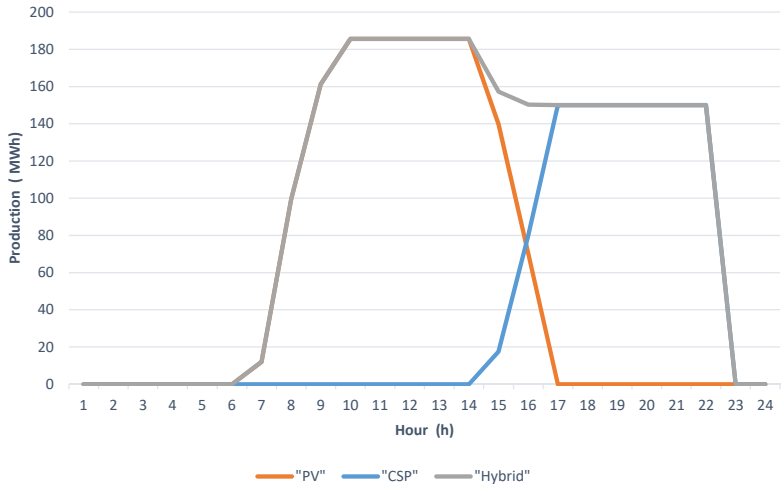
5. The operational strategy of any power plant pool should be linked to the structure of the electricity demand. In Morocco, the typical load profile (Figure A1.1) shows a usual peak around 7 pm in winter time and at around 10 pm in summer time. This electricity demand does not follow the normal generation curve of pure PV or CSP plants.

Figure A1.1 – Typical daily load profile in Morocco for different day typology



6. The solution of PV/CSP hybrid plant is designed to adapt the generation profile to the demand, optimizing the cost of infrastructures and minimizing the cost of the electricity. The combined generation profile, as shown in Figure A1.2, is therefore more adapted to the typical load profile. In comparison with individual CSP and PV plants, a hybrid offers an optimized generation control, while minimizing the common infrastructure costs.

Figure A1.2 – Typical generation profile for PV, CSP and hybrid PV/CSP plants



III. Project Description

7. Project consists of two subcomponents: (i) development of Noor-Midelt I and II (which comprise the first phase of the Noor-Midelt complex) through the formation of a partnership between MASEN and a competitively-selected partner; (ii) construction of the associated facilities needed for Noor-Midelt I and II's operation.

8. Under the second subcomponent five additional associated facilities will be financed: (i) the Noor Midelt substation with step-up transformation 60/225 kV; (ii) the Noor Midelt – El Ouali 400 kV 180 km transmission line, necessary for the evacuation of power from the Noor-Midelt Solar Power Complex; (iii) the water pipeline between Hassan II dam and the solar complex, necessary for water supply to the solar plants; (iv) access road; and (v) telecom lines.

(a) General plant definition

9. As previously mentioned, the first phase of the Noor-Midelt solar power complex will consist in two hybrid plants. Each Plant will have a maximum nominal power between 300-400 MW. The net capacity during the day could not exceed by more than 20 percent the net capacity during night (after sunset). Net capacity will be measured at the delivery point at the Noor-Midelt substation.

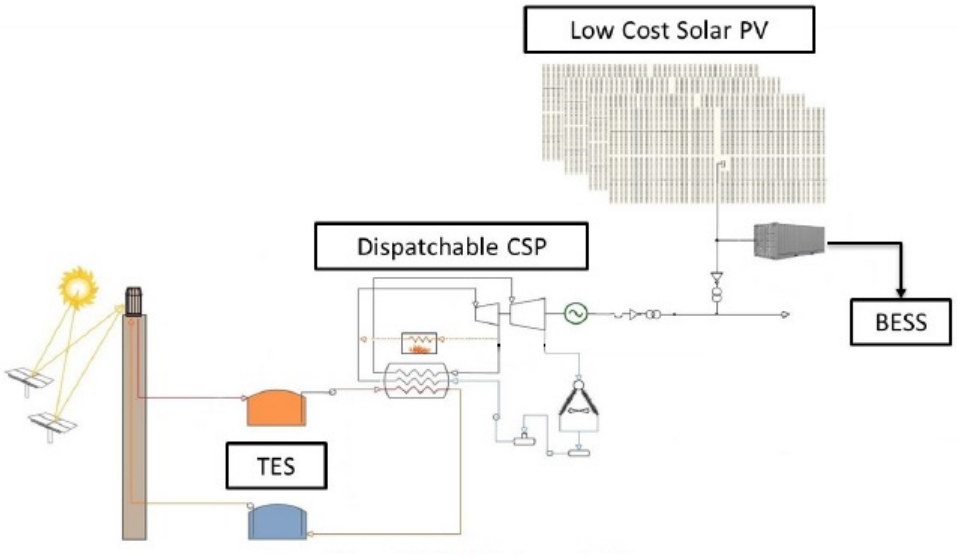
(b) PV/CSP hybrid concept

10. The concept of hybrid PV/CSP power plants has been gaining interest in several countries over the past years[12] PV/CSP hybrids may offer a more economical way of producing intermediate, peaking or base load power generation for specific markets than CSP or PV alone. A simplified PV/CSP plant configuration is shown in Figure A1.7. PV can provide electricity in the daytime and when it declines, CSP with storage would enter into operation and cover at least the peak times of the system. In this project concept, any CSP and PV technology can be used and combined in order to optimize the plant output.

11. The hybridization of CSP with PV can increase the capacity factor of a solar plant. Generally, to increase the capacity factor of a CSP plant, the TES and solar field need to be increased in relation to the power block. However, there may come a point where the small power block, relative to the other components, cannot convert all the energy the plant is capable of collecting and storing. At this point the cost-effectiveness of the system decreases. On the other side, with PV alone, some form of backup is needed to reach full baseload capacity, whether it is sourced from fossil fuel generation or currently expensive BESS. By combining the CSP plant with PV, high capacity factors may be achieved at a lower cost than CSP or PV alone

[12] In addition to Morocco, Argentina, Chile, Egypt and South Africa are planning the construction of hybrid solar plants. Saudi Arabia announced earlier this year a renewable energy target of 9.5 GW by 2023 and hybrid solar plants could be an ideal match for the Kingdom's electricity demand profile.

Figure A1.3 – PV/CSP hybrid plan model (Source: SolarReserve)



(c) Site Description

12. The site, a 3,153 ha green field area situated 25 km North of Midelt, is well suited for solar projects, especially for the development of CSP, because of:

- Excellent solar resources. Based on the analysis of the measured time series data, the long-term annual average of Direct Normal Irradiance is 2,359 kWh/m^2 and Global Horizontal Irradiance is 2,096 kWh/m^2. Similar annual DNI and GHI can be expected in any single year, which is significantly higher than typical site qualification limits and satellite data used in the preliminary modelling.

- Availability of water. The Hassan II dam, with a capacity of 400 million m^3, is located just 14 km from the site and will supply the water to the complex. However, the plants will be designed to use dry cooling, so the requirement of the complex for water is much reduced and each plant is not expected to require more than 520,000 m^3 (0.13 percent of annual dam capacity). Therefore, the Noor-Midelt Complex's impact on the overall water resources in the region is minimal, representing a consumption of approximately 0.5 percent of the Regular Annual Volume of Hassan II dam.

- Accessibility. The site will be accessible via paved tracks originating from the paved N13 road that runs, in combination with N2 or A1/2/3, from the port city of Tangier, approximately 450 km from the Site, and Casablanca, approximately 400 km from the Site. Three ports, Tangier, Casablanca and Agadir (600 km), are at a medium distance and could be used to import and transport heavy equipment.

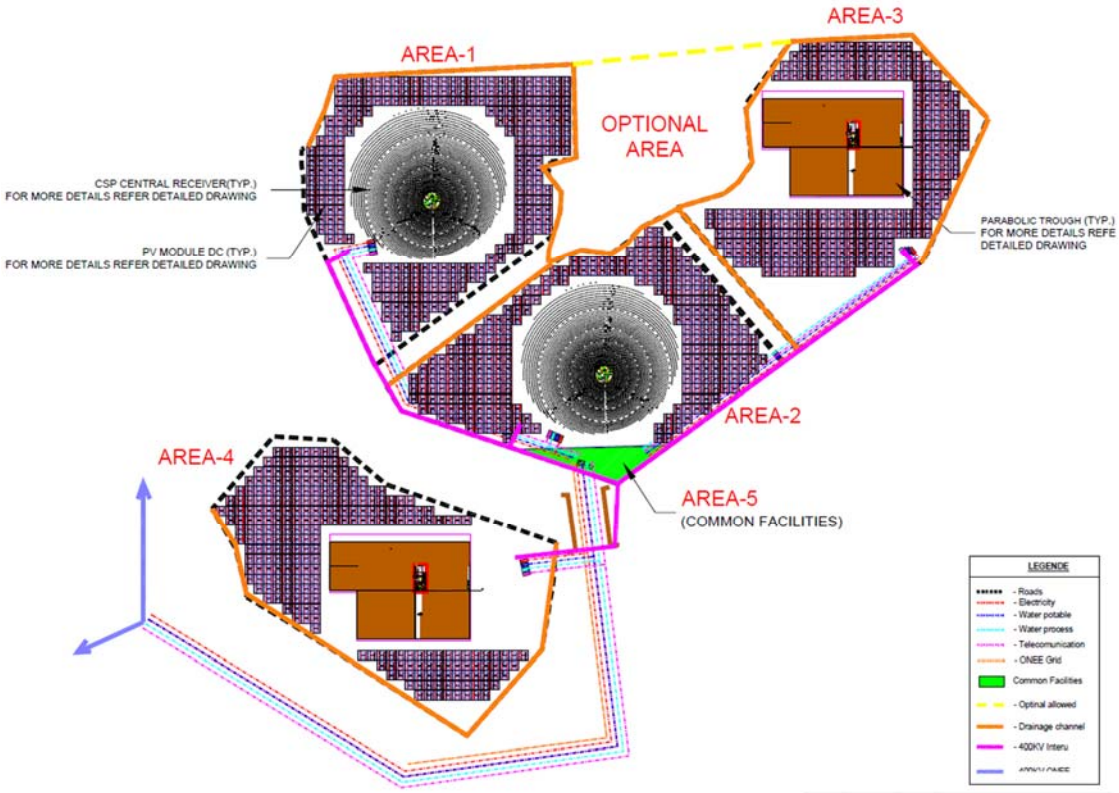
- The connection to the power grid will be done through a 180 km line to the El Ouali substation. The existing grid and planned reinforcements by ONEE will allow evacuation of the full capacity of the power plant and the complex at peak output conditions. Furthermore, the concept of PV/CSP fitted with energy storage capabilities allows the optimization of peak output to meet the network carrying capacity within reasonable limits.

(d) Plant Layout and Design

13. The first phase of the Noor-Midelt Solar Power complex will consist of two similar hybrid photovoltaics (PV) and concentrating solar power (CSP) plant of a maximum gross capacity of between 300 and 400 MW, using both technologies in an optimal way to optimize cost and fulfill the required features. The CSP plant, will be either parabolic trough or tower technology and will include a Thermal Energy Storage Capacity (with Molten Salt Fluid or MSF) to secure at least 5 hours of peak production after the sunset. Bidders may propose Battery Energy Storage System (BESS) in order to optimize the plants outputs. The plants should operate for over a minimum of 25 years during the lifetime of the Plant from the Initial Commercial Operation Date.

14. Both plants would be constructed on adjacent lots according to the scheme of Figure A1.9 in a land that has already been acquired by MASEN. In terms of land usage, the bidders will use a maximum of 1,030 ha for each of the plants. The bidders will reduce, to the extent possible, the site footprint but taking into account all requirements for operation and maintenance. The bidders will justify the area required for each plant.

Figure A1.9 –Noor-Midelt Complex Site Layout. Two first plants proposed by this project, will be located in Area-2 and Area-3[13]



(e) Plant Operations

15. Both Noor-Midelt solar power complex plants will be of solar hybrid PV/CSP configuration and will be designed, manufactured and configured, installed, erected, operated and maintained in such a way that it will achieve highest availability and reliability with minimum generation costs. Capital and operational costs will be optimized to achieve a competitive price of delivered electricity.

16. The specific designs of the plants have to be proposed by the respective bidders in order to meet the minimum requirement set by MASEN. These requirements include:

i. The net capacity during day could not exceed by more than 20 percent the net capacity during night (after sunset). Net capacity shall be measured at the delivery point at the Noor-Midelt substation.

[13] The complex has been depicted as it will look once completed with the four plants. Currently there is no facilities in the area. The figure shows specific CSP technologies but just for illustration. Bidders will be unrestricted to propose any CSP technology.

ii. The plants will produce electricity during daytime using PV and/or CSP. I.e., during the day, electricity may be produced exclusively from PV and secure 5 hours peak production after sunset from CSP with thermal storage. Generation during the peak-hours' time slot yields higher value to MASEN and ONEE because it is expected to largely displace more expensive generation from combined-cycle gas turbines (CCGT) using imported LNG.

iii. The CSP gross capacity shall be between 150 MW and 190 MW with a minimum of 5 hours full load storage to cover after sunset peak hours from CSP.

iv. The PV capacity will be provided by Bidders depending on the selected CSP capacity, their contemplated optimization approach and operating mode taking into account the final requirements of the bidding process and, in particular, the load curve conditions. Bidders may also propose battery energy storage (BESS) in order to optimize the output of the plan.

v. The DC/AC ratio shall be optimized to minimize the generation costs of the hybrid PV-CSP Power Plant while producing a firm output during sunny days.

17. The plants will follow environmentally sound practices and comply with the recommendations of the FESIA.

18. The Plant shall be of solar-only configuration. No fossil fuels shall be used for power generation. Fuel-burning equipment shall be used only for auxiliary support functions (i.e. Plant start-up and safe operation). Acceptable auxiliary fuels for the Plant include propane, low sulphur diesel (< 50 ppm) and/or light fuel. The use of auxiliary fuels will be prohibited when the following conditions are applied. In all these cases, all fuel burners must be shut off:

a. When steam for turbine start-up can be generated by the SGS (e.g. thermal energy taken from TES);

b. When the Plant is exporting power to the Grid.

c. If the CSP technology is parabolic trough:

i. When the HTF loop temperature (measured behind the recirculation pump) is above the HTF Freeze Protection Temperature as defined by the Bidder in Appendix F. Such temperature shall be below 100°C.

ii. When the MSF temperature (measured on any side of the HTF/MSF heat exchangers when transferring MSF between tanks) is above the MSF Freeze Protection Temperature. Such temperature shall be below 250°C.

19. Very importantly, the plants are requested to be designed to minimize water consumption. The maximum annual quantity of available water for all needs on Site is 520,000 m^3 for each first phase plant of the Noor-Midelt Solar Complex. Among other measures:

I. Auxiliary cooling water systems will be designed as a closed loop and sized to minimize water loss. The bidder will provide a dry cooling solution for the purpose of primary condensation of steam, selecting as main cooling system an Air-Cooled Condenser (ACC);

II. the raw water treatment system will be designed to minimize the global raw water consumption; and

III. sanitary waste water from the plant area will be treated in biological treatment plant where all sanitary effluents will be reduced from organic matter to stable sediment. The treated water discharged from this plant will be conveyed to the evaporation ponds.

(f) Technology Assessment

20. As previously described, the proposed Project includes the construction of two large-scale hybrid PV/CSP plants. The technology for the CSP plant section would remain open to be proposed by the bidders between parabolic trough and tower, and in any case with thermal storage with molten salts. For the PV plant section the bidder can also select the most cost effective technology and may include BESS in order to optimize the whole plant performance.

21. The parabolic trough choice is considered a proven and fully commercial technology for energy production, and the plant presents no unusual construction or operational challenges for a power plant of that size. Parabolic trough is the CSP technology with the most commercial operating experience. At the end of 2016, around 4,400 MW of installed CSP capacity used the parabolic trough technology and accounted for 82 percent of today installed CSP capacity. The MFS for the Noor-Midelt plants will be prepared by MASEN incorporating international best practices and the lessons learned from Noor-Ouarzazate plants procurement process. The technical specifications will also be reviewed and commented by the donors' technical experts.

22. The solar tower technology is still an evolving technology in its early commercial stages. Solar tower has higher capital costs than parabolic trough, and the operational experience is more limited due to the reduced number of projects under construction and operation. The total capacity in operation has recently increased to almost 660 MW. Ivanpah and Crescent Dunes in US, Khi in South Africa, and Gemasolar in Spain show that it is possible to build and operate large scale solar towers using different technologies (molten salt or direct steam as working fluid). Moreover, there are several large scale solar towers under construction, as Noor III in Morocco, Redstone in South Africa, and Ashalim in Israel. Although the construction and commissioning of the initial projects took longer than initially planned, the recent increase on the technology development has improved the design and construction methods, so it is expected that, by the time the Noor-Midelt solar power complex plants are ready for construction, the lessons learn from other plants can be applied and the risk of delays will be mitigated.

23. Solar tower technology also has important benefits that make it very attractive and potentially better than other CSP technologies: (i) higher conversion efficiency from solar thermal energy to electricity since they can achieve very high temperatures with manageable losses by using molten salt as a heat transfer fluid. This allows higher operating temperatures and steam cycle efficiency, and reduce the cost of thermal energy storage by allowing a higher temperature differential (ii) molten salt towers

have lower water consumption requirements; (iii) greater potential for cost reduction and local manufacturing. These advantages are driving the increasing share of solar tower projects planned worldwide and according to several expert sources, solar towers might become the technology of choice in the future.

24. To better appraise the analytical basis of MASEN's hybrid technology selection, several recent studies and initiatives can be mentioned. In particular, the Bank commissioned a study in 2013 to determine the optimal least-cost expansion choice of renewable energy technologies in ONEE's transmission system.[14] The study focused particularly on the impact of PV solar plants as compared to CSP with storage. On one side, the study found that, on a *capacity* basis, PV plants would be a better choice, yielding the least cost to the system according to the least-cost planning model. On the other hand the capacity-based analysis does not take into consideration the substantial additional costs, particularly where large renewable energy penetration is expected, that the grid will have to incur to support variable generation, such as PV generation. Thus, the grid needs more operational reserves, such as fast-starting plants, to provide the necessary flexibility to maintain high levels of reliability and stability. In Morocco's case, the operational reserves are provided by imported gas or liquid fuels, meaning that, aside from the extra cost of adding and maintaining such spinning reserves, and the need to continue to rely on imported fuels to meet the country's energy needs, these reserves increase the GHG emissions from the system. In this regard, CSP technology can be designed to cover the necessary reserves and provide ancillary services using the thermal storage beyond the fluctuations of solar radiation and after daylight.

25. Nonetheless, while CSP generation presents clear benefits to grid operations and system costs, its relatively higher capital costs, when compared to PV and traditional fossil fuel technologies, have practical financing implications. These costs are expected to decline by 40-50 percent over the next 10 years, and decrease ever further till 2050. Until these cost reductions materialize, however, governments need to address sustainability of the investment from a financial and fiscal perspective much in the same way as was needed for wind power and PV technologies in early stages of their development. Governments had typically adopted incentive programs that helped reduce project costs or increase project revenue to support the higher debt levels needed to finance these costs.

26. The hybrid solution combines the advantages of PV and CSP in the same plant. In one hand, hybrids provides an affordable power production from PV, and on the other hand CSP plants can optimize their design to extend their operating hours into the evening demand peak by increasing their solar multiple (i.e., increasing the size of the solar field) and using thermal storage to. Thus, the combined technology yields a much higher capacity factor than PV plants alone at a much reduced price than CSP plants alone. The hybrid plant, thanks to the CSP generation, could also provide reserve capacity and other ancillary services to mitigate system regulation issues and imbalances caused by intermittent plants.

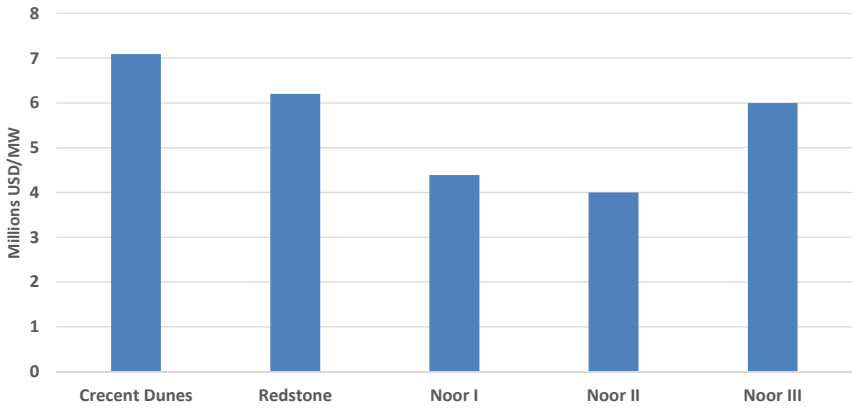
(g) Noor Midelt plants cost benchmark and estimation

27. CSP project costs are heavily dependent on local conditions, mainly DNI, and on storage hours. Figure A1.11 depicts the investment costs of the latest projects in the international landscape. According to those experiences and the local conditions in Midelt the expected CSP costs have been modeled and

[14] Mercados, *Morocco: Analysis of Low Carbon Development Options in the Power Sector* (2013).

represented in Figure A1.11. On the other hand, PV costs have been heavily declining during the last years and, according to the last NREL report for PV in the US in 2016[15], it can be estimated that the cost of installed utility scale PV is now at US$1.42/Wp.

Figure A1.11 Investment costs benchmark for most recent CSP project



28. The hybrid solution cannot be directly benchmarked in the international concept. At this time there are no international experiences with this type of plants, though another project has just been announced in Antofagasta (Chile) which is under development. However, the hybrid solution can easily be benchmarked indirectly, considering international CSP and PV project costs independently. Following the separated analysis above, a preliminary cost has been estimated for the different possible configurations of Noor-Midelt I and II. This estimate considers that each plant will have a total nominal power between 300 MW and 400 MW with a CSP section between 150 MW and 190 MW with 5 hours storage. Table A1.2 includes the cost estimation for all these possibilities, showing that the total cost of Midelt Phase I will be between US$1.8 billion and US$2.3 billion[16].

Table A1.2 Estimated cost for Noor Midelt Phase I

		Plant total nominal power (MW)	
		300	400
CSP section (MW)	150	$ 1,800 million	$ 2,020 million
	190	$ 2,040 million	$ 2,300 million

(h) Associated Facilities

29. The following main facilities are currently considered critical to operation of Noor-Midelt Solar Power Complex and specifically for the first phase two projects: financed: (i) the Noor Midelt substation

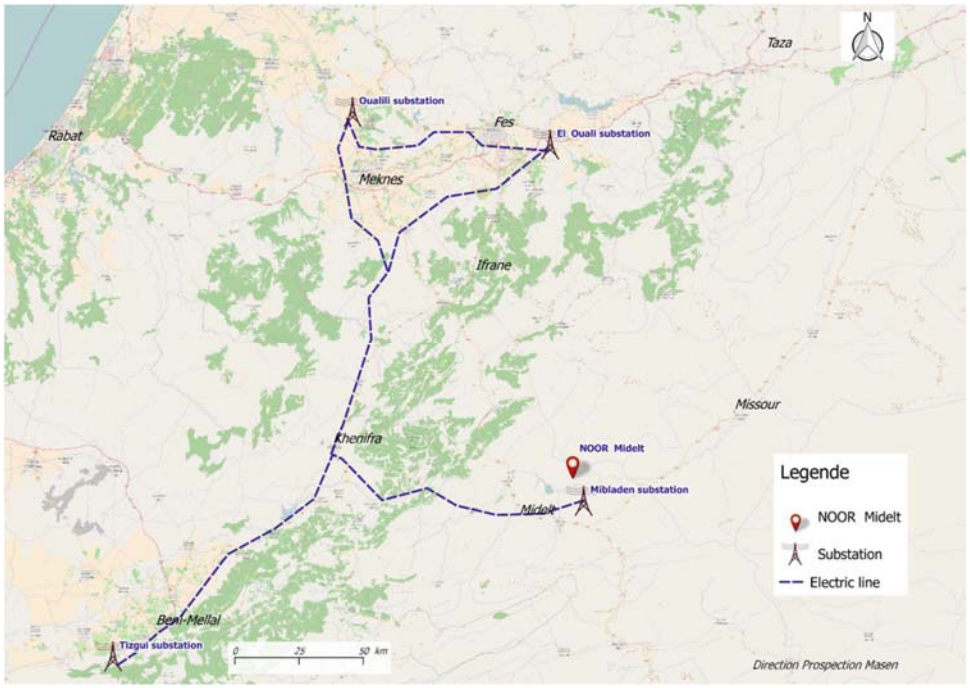
[15] NREL. U.S. Solar Photovoltaic System Cost Benchmark Q1 2016

[16] Same model has been applied for the announced hybrid plant in Antofagasta (Chile) resulting in an estimated price of $600 million, which is very similar to the real estimation provided by the Chilean authorities.

with step up transformation 60/225 kV; (ii) the Noor Midelt – El Ouali 400 kV 180 km transmission line, necessary for the evacuation of power from the Noor-Midelt Solar Power Complex; (iii) the water pipeline between Hassan II dam and the Solar Power Complex, necessary for water supply to the solar plants; (iv) the access road to the Midelt complex; and (v) a telecom line to communicate the complex.

30. The energy delivery point to ONEE national grid will be the Noor-Midelt substation. For the two first plants of the solar complex the energy will be delivered in 225 kV. However, the 180 km transmission line from Noor Midelt to El Ouali will be designed for 400 kV in order to upgrade the step up transformation for the third and fourth complex plants. Figure A1.12 depicts the preliminary route of the electric line that will connect Noor-Midelt Complex with the national grid.

Figure A1.12 – Electric infrastructure (Source: Masen Prospection Dept.)



ANNEX 2: REVISED IMPLEMENTATION ARRANGEMENTS AND SUPPORT PLAN

I. Revised Implementation Arrangements

Project Institutional and Implementation Arrangements

1. MASEN is responsible for defining all the technical, safeguards, and fiduciary aspects of Noor-Midelt Phase 1. The proposed Project will be implemented through PPPs between MASEN and the private sponsors that will form SPCs, which will be the Project Implementing Entities, to design, construct, own, operate, and maintain Noor-Midelt I and II. The sponsors are selected through a 3-stage competitive procurement process. The first stage is pre-qualification of interested bidders. The second stage involves preliminary technical bids to meet MASEN's minimum functional specifications. This allows MASEN the opportunity to evaluate the technical proposals and any innovative approaches offered by bidders to meet the requirements.

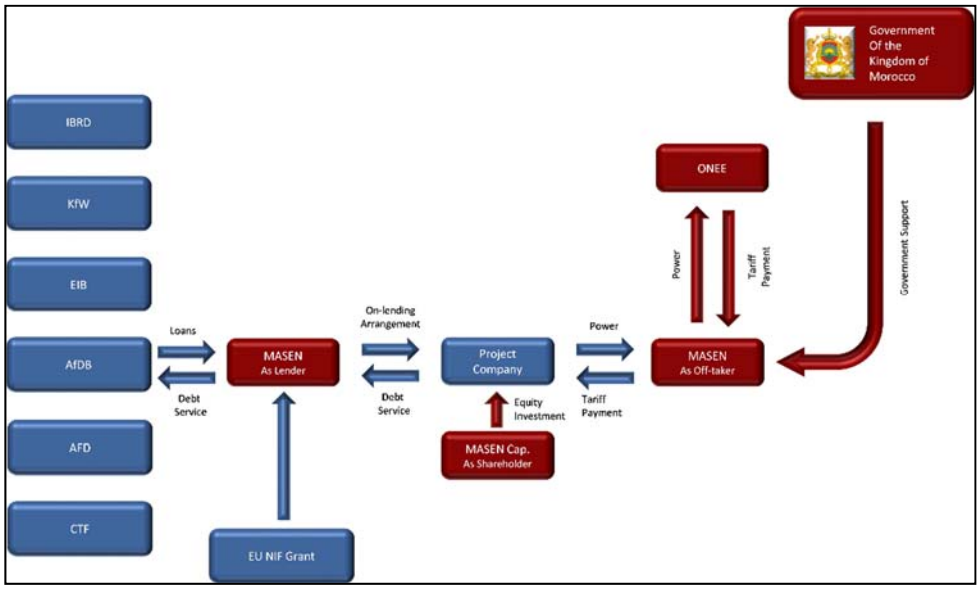
2. The third stage involves revised technical bids and financial offers, in the form of a proposed LCOE to be paid by MASEN for electricity produced by Noor-Midelt Phase 1**.** In order for bidders to provide financial offers, MASEN needs to provide to them, during this second stage, the terms of the debt financing MASEN will provide the selected SPC. As MASEN aims to reach commercial closing (i.e., reaching agreement on all of the commercial issues) contemporaneous with award, MASEN needs to know the final terms of debt financing that will be made available to it from IFIs prior to concluding this third stage bid process.

3. Once selected, the winning bidders are expected to enter, through the SPCs, into a suite of agreements with MASEN to provide the contractual basis for the PPP. The structure of the PPP is largely based on typical commercially-financed, limited recourse transactions for infrastructure projects. MASEN will enter into a power purchase agreement (PPA) with the selected bidder(s) to purchase the entire output of Noor-Midelt Phase 1 at the competitively determined LCOE. MASEN will, in turn, enter into a power sales agreement (PSA) to sell this power to ONEE at the high-voltage system tariff. GoM will compensate MASEN for the difference (or "gap") between the PPA and the PSA, according to a *Convention* signed between GoM and MASEN in October 2010 and *specific Conventions* to be signed upon creation of the SPCs. More generally, the GoM and MASEN entered into a *general Convention* that provides for the Government's commitment to maintain MASEN's financial viability in implementing Noor.

4. MASEN is also expected to take a 25 percent equity interest in the SPCs. The agency's participation in the day-to-day activities of these vehicles is expected to be limited to the typical role of a minority shareholder.

5. As illustrated in the Figure below, MASEN is expected to enter into a lending arrangement with the SPCs to pass to them the proceeds of the IFI financing made available to MASEN for Noor-Midelt Phase 1**.** These proceeds are expected to comprise the bulk of the debt financing of the projects and cover 80 percent of the costs. The amount of debt financing will depend on the final bid award prices that will determine the overall project costs. The remaining 20 percent of the plants' costs will be covered by commercial equity provided by the SPCs' shareholders.

Institutional and Implementation Arrangements



6. MASEN was created, as the Moroccan Agency for Solar Energy, in 2010 by Law 57-09 to oversee the development and operation of the solar power program Noor, as well as the creation of a local solar industry. MASEN is a corporation ("*société anonyme*") with all shares, directly or indirectly, held by the GoM. Law 37-16, approved by Parliament in September 2016, changes MASEN's name to Moroccan Agency for Sustainable Energy and extends its role and responsibilities to cover all forms of renewable energy, except pumped hydro. After a 5-year transition period, all of ONEE renewable energy assets will be transferred to MASEN, as well as the labor force assigned to those assets.

7. MASEN is governed by a Board of Directors ("*Directoire*") and a Management Board ("*Conseil d'Administration*"). Their functions and responsibilities are defined in MASEN's Statutes as required by Law. MASEN's Management Board consists of 10 members, including the Ministers of Economy and Finance; Energy, Mines, Water, and Environment; Industry, Commerce, and New Technologies; and Interior.

8. MASEN retained the service of several well reputed international technical, legal, and financial advisors to assist in the structuring and implementation of the procurement process to select the private sector sponsors for Noor-Midelt Phase 1. MASEN also expects to retain the services of a technical firm to assist in monitoring construction of the projects, and an independent expert to certify completion of the major milestones on the project.

Financial Management

9. **Financial System assessment**. As part of the Noor-Ouarzazate I, II and III, MASEN established a financial management system satisfactory[17] to the Bank. This system is based on rules applicable to commercial law of the Kingdom of Morocco. MASEN's internal control system is deemed adequate and comprises: (i) well-qualified staff conversant with donors' financial management procedures, (ii) an acceptable manual of procedures, (iii) a well-performing accounting and budgeting software, and (iv) the existence of an internal audit unit. The overall system timely produces the annual and in year financial reports submitted an independent external auditor. Similar to the approach adopted for Noor-Ouarzazate I, II and III, the existing financial management system will be applied for the additional financing.

10. **Accounting and Budgeting**. The existing accounting and budgeting procedures will be used for the additional financial. The chart of account and the budget classification will be customized to record and keep track the transactions of the additional financing.

11. **Financial reporting**. Similar to the Parent project, the interim unaudited financial reports and the annual financial reports, which will cover all the activities and sources of funds of the Project, will be prepared based on the national accounting standards (acceptable to the Bank). The interim unaudited financial reports will be prepared twice a year by MASEN based on the agreed format and transmitted to the Bank 45 days after the end of each semester. The annual financial statements will be included in the financial report submitted to the auditor and the Board. Distinction will be made between the original projects and the additional financial financing expenditures.

12. **Audits.** The external annual audit report of the Project's accounts and the management letter covering recommendations to improve the internal controls and the accounting system will be transmitted by MASEN to the Bank no later than six (6) months after the end of each fiscal year. Moreover, the annual audit report of the Project's accounts (for both CTF and IBRD funds) will be carried out in accordance with the Bank guidelines by an acceptable auditor and according to terms of references acceptable to the Bank. As part of the Project's preparation process, the Bank appraised the system and related procedures to ensure its continued compliance with the Bank's policy on investment project financing. In addition, MASEN was informed of the Bank's Access to Information Policy, which mandates that the Bank and MASEN make the Project audit report publicly available in a timely fashion and in a manner acceptable to the Bank. MASEN requested, and the Bank has agreed to, only partial publication of its audit report as well as the SPCs' audit reports as certain information can be considered confidential.

13. **SPC's Financial Management arrangements.** MASEN is expected to adopt the same project structure and implementation approach followed for the Noor-Ouarzazate Solar Complex. The Project is expected to be implemented by one or more competitively selected private sector sponsors. The selected sponsors are expected to form a special purpose company (SPC) that will design, construct, own, operate, and maintain the proposed plants, and sell the electricity generated to MASEN under 25-year power purchase agreements (PPAs). MASEN in turn will enter into 25-year PPAs with ONEE to sell this power at the wholesale cost of power on the grid. Although a single procurement process is contemplated to award

[17] The last supervision of the project rated the FM performance as satisfactory and the risk as moderate.

both plants comprising the Project, the process will be designed to allow award of the plants to different bidders.

14. The SPCs, which will be the Project Implementing Entities, will not be identified until after conclusion of the procurement process and award of Noor-Midelt. As such, appraisal of their accounting and management system is not possible until then. However, the CTF and IBRD loan agreements require, as a condition to disbursement under the agreements, that the SPCs establish an accounting and financial management system acceptable to the Bank. It is envisaged that this system would provide for preparation of annual financial statements and periodic expenditure reports by component, category, and source of funding. Once established, the SPCs will be audited annually by an independent external auditor acceptable to the Bank, and the audit report will be shared with the Bank no later than 6 months after the end of the related year. MASEN is expected to reflect these requirements in the conditions to effectiveness or disbursement of the PPA(s), the financing agreement(s) governing the on-lending arrangements of IFI funds, or other similar contracts entered into with the SPCs. As part of verifying compliance with these conditions, the Bank will confirm ongoing adherence to Bank Policy on Investment Project Financing requirements for financial management.

Disbursements

15. Disbursements under each of the Categories as defined in the IBRD and CTF loan agreements are detailed in the tables below:

IBRD Loan Allocation to Eligible Expenditures

Category	Amount of the Loan Allocated (expressed in [USD])	Percentage of Expenditures to be financed (inclusive of Taxes)
(1) Goods, works and non-consulting services for Part 3.A of the Project	49,875,000	6%
(2) Goods, works and non-consulting services for Part 3.B of the Project	49,875,000	6%
(3) Front-end Fee	250,000	Amount payable pursuant to Section 2.03 of this Agreement in accordance with Section 2.07 (b) of the General Conditions

(4) Interest Rate Cap or Interest Rate Collar premium	0	Amount due pursuant to Section 4.05 (c) of the General Conditions
TOTAL AMOUNT	**100,000,000**	

CTF Loan Allocation to Eligible Expenditures

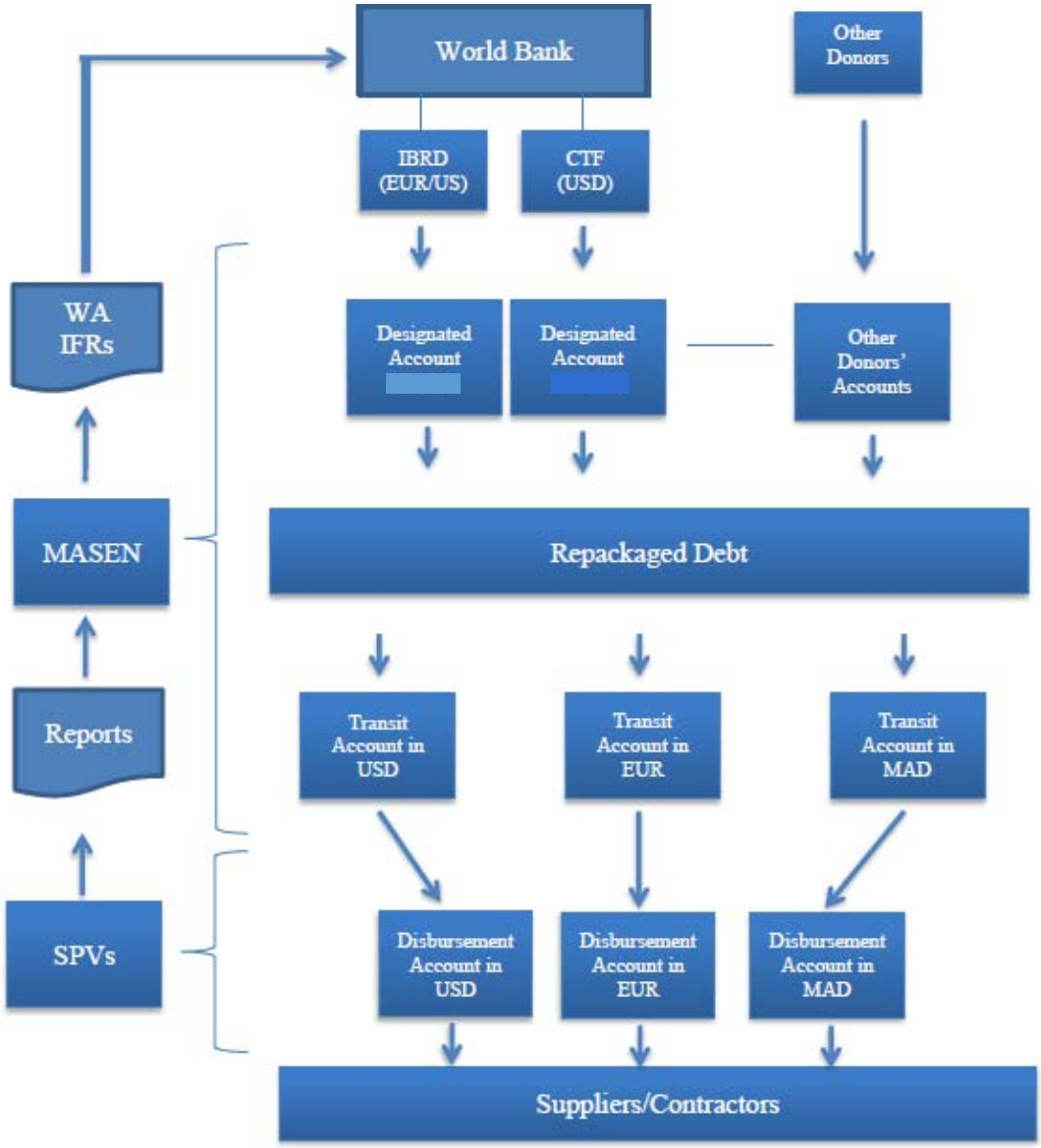
Category	Amount of the Loan Allocated (expressed in USD)	Percentage of Expenditures to be Financed (inclusive of Taxes)
(1) Goods, works and non-consulting services under Part 3.A of the Project	12,500,000	50%
(2) Goods, works and non-consulting services under Part 3.B of the Project	12,500,000	50%
TOTAL AMOUNT	**25,000,000**	

16. Withdrawals from the IBRD and AfDB-administered CTF loans will be done on a pari-passu basis, as will withdrawals from the IBRD and other IFIs loans under Component 1 following full disbursement of the CTF loans. MASEN has also requested the flexibility to undertake retroactive financing within the limits of the Bank's policies.

17. Proceeds from the CTF and IBRD loans under will be deposited in two Designated Accounts (DA) denominated in US dollars and Euros at the Bank Al Maghreb, a financial institution acceptable to IBRD. The DAs will be segregated such that CTF and IBRD funds disbursed to these accounts will not be comingled with other donors' funds. Report-based disbursements will be followed, and CTF and IBRD loans proceeds will be advanced into the appropriate DA with a ceiling equivalent to a cash forecast of 3 quarters of expenditures provided by MASEN in semester unaudited Interim Financial Reports (IFRs). The IFRs will be provided, in form and substance satisfactory to the Bank, using the template attached to the Disbursement Letter.

18. Each IFR will include a technical audit report acceptable to the Bank, prepared by an independent verification expert under terms of reference satisfactory to the Bank.

19. The below figure shows the flow of funds.



Procurement

20. Procurement for the project will be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers, dated July 1, 2016, hereinafter referred to as "Regulations". The project will be subject to the Bank's Anticorruption Guidelines.

21. As per the requirement of the Regulations, a Project Procurement Strategy Development (PPSD) and a procurement plan have been prepared. These documents set out the selection methods to be followed by the borrower during project implementation in the procurement of goods, works, non-consulting and consulting services financed by the Bank. The Procurement Plan will be updated at least annually or as required to reflect the actual project implementation needs and improvements in institutional capacity.

22. Summary of PPSD

NOOR Midelt Phase I project will be developed under an IPP scheme (Independent Power Production) through a PPP structure (Private Public Partnership). The selected private partner(s) will be in charge of the design, financing, construction, operation and maintenance of the power plants Project which costs are estimated at 1149 M$ per power plant.

The Project's procurement consists of the competitive selection of private sector sponsor(s) for a partnership with MASEN to design, build, own, operate, and transfer the Noor-Midelt plants. The procurement process follows the requirements of World Bank Procurement Regulations for Borrowers for Goods, Works, Non-Consulting and Consulting Services dated July 1, 2016 and applicable to Investment Project Financing (IPF). It will consist in a three-stage international competitive bidding process. The Selected bidder (s) shall be the one (s) offering the most advantageous proposals defined as (i) substantially compliant with the request for proposal requirements and (ii) providing the lowest kWh tariff.

Once selected, the sponsors would then be free to procure goods, works, and consulting/non-consulting services required to implement the contemplated arrangement from eligible sources using the sponsors' own procedures.

23. **Systematic Tracking of Exchanges in Procurement (STEP).** The project will implement STEP, a planning and tracking system, which would provide data on procurement activities, establish benchmarks. The details of the procurement activities, presently prepared in the procurement plan would be transferred in the STEP system. Initial training on the operation of the STEP system was provided to MASEN staff involved in the implementation of the Noor-Midelt project.

Procurement Capacity and Risk Assessment of Implementing Agencies

24. **Procurement risk assessment.** A procurement capacity and risk assessment has been carried out by the Bank. It's an update of the previous assessment carried for Noor Ouarzazate II and III.

25. MASEN has the status of "Société Anonyme" (limited liability Company with Management Board), ruled under private law, with public capital and a Management Board. It is not governed by the public procurement decree, but follows its own procurement rules dated on April 6, 2011, complemented by a well-structured manual of procedures, with a dedicated "Procurement" module. The procedures for

selection of private partner for PPP operations, developed with IFI under previous projects became now fully integrated to MASEN procurement procedures. From the experience gathered in previous operations, namely the 1st and 2nd phases of Morocco CSP projects (Noor-Ouarzazate I and Noor Ouarzazate II and III), MASEN becomes familiar with Bank procurement procedures and requirements, for the selection of private partner for PPP arrangement (ref. Annex XIV of the Bank's procurement Regulations). However, the risk of the project remains high, as in Noor-Ouarzazate I, II and III, considering the complexity of the operation. Therefore, the Bank's close follow up and support is key for a timely and successful completion of the procurement process. With regard to capacity building, the Bank has already provided training to MASEN's staff on its procurement regulations, including the electronic management tool (STEP). Based on the assessment and taking note of the role and responsibility of the agencies responsible for procurement, the procurement risk is rated as **"Substantial"**.

26. As a state owned entity, MASEN is under the oversight of the "*Direction des Etablissements Publics et de la Privatisation" (*DEPP*)*. By the law, MASEN is subject to the audit of the General Inspectorate of Finance (IGF) and the Court of Account (CoA).

27. Procurement of private sponsors for CSP projects is the responsibility of MASEN's Structuring Department (*Direction Structuration*), supported by staff from other departments, such as "Engineering Design" and "Strategic Management" as needed. The Structuring team also relies on consultants to prepare bidding documents and bid evaluation reports. Because procurement of sponsors for CSP projects is complex, MASEN is assisted by several consultants for the management of the whole procurement process (preparation of the RFP, management of selection process).

28. Because of the need to accelerate construction of the plants, the procurement process has started during the project preparation and is progressing. On July 26, 2016, MASEN issued an invitation for prequalification that provided a description of Noor-Midelt, and enumerated the requirements for prequalification. Under the current schedule, MASEN expects to provide the Bank for review the evaluation report of the first stage (RfP 1) technical bids and launch the second stage (RfP 2) financial bids in the second half of 2018 after the Bank's review and no objection to report's recommendations.

29. **Oversight and Monitoring by the Bank:** The procurement for the selection of the private partner will be subject to Bank prior review.

30. **Frequency of procurement supervision**. Two missions a year, at an interval of six months, are envisaged for the supervision of the proposed project. This supervision will cover procurement aspects and contract management.

31. **Contract management**. Due to the high risk and high value linked to the CSP plants, a close contract management support will be carried out during project implementation. Key performance indicators (KPI) will be developed and monitored during the construction of the plants.

Environmental and Social (including safeguards)

(a) Social

32. The main responsibility for the adequate preparation and implementation of the Framework Environmental and Social Assessment (FESIA), Specific Environmental and Social Management Plans (SESMPs), and the Health and Safety Plan (H&S Plan) will be with the Developer and the Contractors, which is similar to the 3 Ouarzazate solar power projects.[18] During the bidding process, MASEN will make sure the selected Developer and the Contractors will recruit the required capacity for the implementation of the Specific ESMPs (SESMPs) and H&S Plan. During project preparation, attention will be paid to PS2 and PS4, in particular regarding working conditions, management of labor influx, worker's code of conduct and camp management plan including guidelines around maintaining family friendly facilities at project sites and a no tolerance policy for sexual intimidation, harassment and/or violence, etc. Requirements for the application of PS1, PS2, PS3, PS4, PS6 and PS8 by the developer and contractor will be managed through bidding documents and contracts, and MASEN will monitor all safeguards plans.

33. The **Borrower** (MASEN) has gained considerable experience during the implementation of the SESMPs for the Noor-Ouarzazate I, II and III projects. The Noor-Midelt solar power project is expected to be very similar, and MASEN has adequate capacity to implement the project in compliance with World Bank Performance Standards and Environmental, Health and Safety Guidelines. During the construction of the CSP Tower of Noor III in Ouarzazate, there was a lapse in the application of the Health & Safety Procedures, leading to a fatal accident. The Health & Safety System for Noor II and III has since then been significantly strengthened and is now in compliance with international standards.

34. **Environmental and Social Management System.** MASEN developed an Environmental and Social Management System (ESMS). The developers will also be required to develop and implement a project-specific ESMS. MASEN's ESMS is structured on a risk-based assessment of Project-related activities and tasks, identifying appropriate risk mitigations and management actions as well as assigning responsibilities for implementation. It includes a grievance tracking and management system. Currently, MASEN's ESMS is fully developed and operational for the preparation, construction, and operation stages of the Project. In 2017, MASEN obtained the certifications ISO 14001:2015 and OHSAS 18001:2007 for the Integrated Management System. These two certifications apply to all activities and sites managed by MASEN. All processes and procedures required by these standards are established and implemented (legal and regulatory monitoring, risk and impact assessment, control, audit, training, communication and public consultation, emergency management plans, management review, etc.). Several cross-cutting units, fully staffed with full-time personnel, fully budgeted and operational, are contributing to the ESMS, such as Sustainable Development, Local Development, the Health, Safety and Environment (HSE) team, and other units under MASEN implicated in site management.

[18] This includes the Noor-Ouarzazate I, II, and III whose construction was supported under the Parent Project as well as the Ouarzazate I Concentrated Solar Power Plant Project (P122028).

35. MASEN's HSE staff is currently used to monitor construction and operation of the Noor-Ourzazate solar complex, but they are adequate in number and competence. The same HSE staff will be used during construction of the Noor-Midelt plants. The ESMS will be updated if required to meet the Bank's Performance Standards and the applicable WBG HSEGs for the energy sector. MASEN's organogram shows clearly delineated responsibility for environment, health and safety. This has allowed the project enterprise to identify training needs for all staff, either at the "awareness" or "competency" level, and develop training schedules. The developers, still to be selected, will follow the same ESMS procedure.

36. **Labor and employment.** During construction, MASEN and the developers are expected to employ approximately 1500 personnel per plant at peak construction, comprising both direct and indirect workers. Of these, up to 3000 positions for both plants, 80 percent to 85 percent are expected to be locally sourced in Morocco, of which 30 percent are expected to be locally recruited from communities around the plants' sites, subject to availability of potential applicants with the necessary skill sets. Operation of the two solar power plants will require 200 to 300 workers (estimation based on the Noor Ouarzazate Solar Complex), including those to operate ancillary facilities. These estimates are based on the experience with the Noor-Ouarzazate solar complex, and will be updated for the Noor-Midelt as soon as actual data is available and an assessment is made of the availability of local skills.

37. Influx of non-local labor into local communities during construction will have to be managed. It is expected that non-local labor will be living off-site in existing townships and travel daily to the construction site, so social risks to local communities should be moderate and manageable. The CESMP to be prepared by the private developers will include a Labor Influx Management Plan and, in case worker camps are going to be established, a Worker's Camp Management Plan, which identifies the risks of labor influx and camp workers and how these risks will be managed. Recruitment of local labor will be the responsibility of ANAPEC. The same approach as for the 3 Ouarzazate projects will be followed, which worked well. The nearest village is 7 km from the project site, which means that negative environmental and social impacts on villages will be limited.

38. **Land acquisition.** The Noor-Midelt CSP Complex will be constructed on a lot of 3,150 hectares (ha) of land (expandable to 4,141 ha) 20 km north of the town of Midelt in northern Morocco. The site includes no settlements, shelter or housing, no ground attachments, and no livelihood or income-generating activities, as the land is too far from villages (the closest settlements are located at a distance of 7km), unfit for pastoral activities, and has no water supply. The major sources of livelihoods in the other settlements/villages outside the project footprint are subsistence agriculture and remittances from migrants. 2714 ha is managed as communal land by the three ethnic communities of Ait Oueflla, Ait Rahou Ouali, and Ait Massoud Ouali, while around 1427 ha is declared as forest land and currently managed by the communities. No physical displacement will be required, and no ground attachments have been found on the site. The sandy and arid terrain allow only for small scrubs to grow, and the land is not suitable for agricultural development due to lack of water. The land acquisition for the project will have no impacts on the livelihood of local communities: as the land is having only very sparse vegetation, it is used only in a transitional manner for livestock grazing by transhumant non-local communities. Transhumance occurs only along the river crossing the site, along which a corridor will be kept open that can be used for livestock. Local population confirmed the low intensity of use for only temporal pastoralist activities. The area to be acquired covers around 10 percent of the available land of the communities, but much less in terms of income-generating assets.

39. MASEN had started the land acquisition process through willing buyer – willing seller arrangements by negotiating rates for the land acquisition with the communities, and agreements on the cessation of ownership to MASEN and the price per hectare have been reached in early 2016. As of January 2018, the attribution of the compensation payments for the different plots constituting the site was contested in court between the local communities, the Water and Forest administration, and individuals in the communities. Given the legal contestation, MASEN started land acquisition through expropriation under the national laws and regulations. For the expropriation process, the compensation rates agreed upon during negotiations with the communities were used. The expropriation was granted in favor of MASEN by administrative court decision in January 2017, and the court decision publicly disclosed in March 2017. MASEN is therefore in undisputable ownership of the land for the project sites. Cadastral inscription in the name of MASEN for all relevant plots has been finalized as of December 2017. As of December 2016, the full compensation payments have been transferred to an escrow account awaiting the outcomes of the court decision and their final attribution.

40. Remaining actions under the Land Acquisition Plans[19] will be implemented by national institutions and supervised by MASEN. A team of two staff is currently assigned to deal with the land acquisition and E&S management under the Midelt project. Land acquisition has followed national procedures and the requirements of PS5. For communal lands managed by local communities – the cases possible are under LAP 1 following pending court decisions, and for the associated transmission line – the management of compensation payments will be implemented the Department of Rural Affaires, under the Ministry of Interior. The compensation can be either used for community development investments, to be decided by the communities through participatory processes, left for future development investments, or distributed directly to affected households under supervision of DAR. As under Noor Ouarzazate, the use of compensation payments will be supervised by MASEN's social development team. A GRM is being established, including on-site presence and access to staff in MASEN's headquarters, and has been made public through the published LAPs and the FESIA, and will be included in the site-specific ESIAs (SESIAs). The LAP for the associated facility of the 400kV transmission line to be built under the supervision of ONEE, is currently under revision following comments from WB and other donors, and will follow WBG and other donors' requirements to ensure implementation is up to international best practices. The Transmission Line-site LAP will include a baseline of land and economic activities, consultation mechanisms, a GRM, description of compensation standards and source and utilization of funds, and the other elements required. The Transmission Line-site LAP will not allow civil works on sites that have not been properly compensated under the LAP. MASEN followed the same principles for the Ouarzazate projects.

41. **Monitoring mechanisms.** Monitoring of the land acquisition impacts and the implementation of the LAP 1, 2 and 3 will be undertaken by MASEN's ESMS and included in regular project reporting. Monitoring of the Transmission Line-site LAP will be undertaken by ONEE and reported to MASEN, to be included in the regular project reporting to the Bank. A Land Acquisition Completion report will be

[19] LAP 1 covers the main site, both principal site and extension (expropriation finalized, compensation payments in escrow awaiting court decision on distribution); LAP 2 covers the principal access road from RN 13 to the site (no land acquisition as existing right of way is used to harden existing rural road); LAP 3 covers water supply, electricity supply and secondary access road from Hassan II reservoir (land acquisition by exchange between government entities).

prepared by MASEN, including all three MASEN LAP and the Transmission Line-site LAP, after completion of all LAP-related activities, and submitted to the Bank.

(b) **Environment**

42. The Midelt Project will use the World Bank Performance Standards, because it is a Public Private Partnership. The applicable Performance Standards are: PS1, PS2, PS3, PS4, PS5, PS6 and PS8 (Chance Find Procedure will be included in all contractor contracts), as well as the World Bank Group General Environmental, Health and Safety (HSE) Guidelines, the HSE for Thermal Power and for Electric Power Transmission and Distribution of April 2007. The Client has prepared and disclosed a Framework Environmental and Social Impact Assessment (FESIA). The competitively-selected sponsors for each solar plant will prepare their own SESIA and CESMP. The FESIA includes an ESMP, which will be used for the Common Infrastructure, such as the access roads, the water intake, water treatment plant, water pumping station and the water pipeline, all with minimal environmental and social impacts.

43. **Environmental impacts and mitigation measures:** The Project has limited environmental impacts, especially considering the size of the power plants to be constructed. It should be noted that, as a renewable energy facility, the environmental impacts of the underlying solar facilities are significantly lower than an alternative conventional fuel thermal power plant. Most importantly, the Project will reduce air pollution as it is not emitting greenhouse gases or other local pollutants. The project avoids 1 million tons of CO_2 per year. During construction, the Project will provide approximately 1500 temporary jobs per power plant (thus 3000 in total) and 800 jobs for the common infrastructure. During operation 200-300 jobs for the power plants and the common infrastructure will be created.

44. The **potential** environmental risks and impacts in the Project's area of influence are:

- ***Impacts on Soil, Water and Air and Noise Pollution:*** Construction of Noor-Midelt facilities on such large areas of land will require grading, and results in soil compaction, potential alteration of drainage channels, and increased runoff and erosion. Engineering methods will be used to mitigate these impacts. Since there is almost no vegetation, the impacts on natural ecosystems will be minimal. The power plants will be air cooled, so that water use of Phase 1 is only 0.5 percent of the annual inflow of the Hassan II Reservoir. Water is mainly used for cleaning he mirrors, drinking water, sanitation of the office building and make up for steam production. The main uses of the water of the Hassan II dam is for irrigation and drinking water. The Project will have no noticeable impacts on these main functions. Impacts on water quality will be minimal. There will be very limited air pollution during construction, mostly dust, and almost no air pollution during operation. Noise levels during construction and operation will be within international standards.

- ***Ecological impacts:*** The use of large areas of land for the Noor-Midelt solar power facilities will adversely affect native vegetation and wildlife in many ways, including loss of habitat; interference with rainfall and drainage; or potential direct contact causing injury or death (flying birds). These potential impacts on the avifauna will be evaluated and documented in the SESIAs

for each technology, and mitigation measures proposed. However, according to Smit Hanneline[20], the following actions should be taken to mitigate negative impacts on birds: (i) preconstruction monitoring to determine the presence of "threatened, rare, endemic" bird species (the FESIA states that one vulnerable and one threatened bird species are present in the project area); (ii) monitoring should take into account seasonal variation, fly paths and birds' behavior; (iii) during construction the position and height of the receiver tower should be taken into account at the CSP plant with a central receiver on top of the tower; (iv) ensure that birds do not get in contact with evaporation ponds, i.e., ponds should be covered with wire mesh or netting, if needed to reduce the possibilities of attracting birds. Where needed mark the new power lines with anti bird collision devises and use bird-friendly designs to prevent electrocution.

- ***Particulate matter:*** The construction of Noor-Midelt facilities generates particulate matter in the form of dust, which can be a significant hazard, especially for workers during windy conditions. Regular watering of the vehicles and trucks itinerary paths at the construction sites will be undertaken on a regular basis as a mitigation measure to minimize dust pollution.

- ***Risk of toxic fluid leaks:*** The CSP in Noor-Midelt will employ molten salts, hydraulic fluids, coolants, and lubricants that may be hazardous and present spill risks. Proper planning and good maintenance practices will be used to minimize impacts from these hazardous materials. To prevent hazardous and presence of spill and leak risks, tubing and specialized equipment and materials will be used to prevent cracking and corrosion. This mitigation measures will also involve the use of flanges, gaskets, pumps and pump seals, as well as security valves to reduce emissions and leaks, and containment pits to minimize accidental spread of molten salts.

45. Among the key mitigation measures are the Project's safety and security protocols. The Project incorporates worker safety and security measures to mitigate the use and manage the impacts of hazardous materials (molten salts, fossil fuel, etc.), fire hazards and other soil pollution on the environment and human health. To ensure that plant facilities comply with the international standards to provide worker health and safety and protect the environment, Health and Safety and Environmental and Social personnel will permanently monitor the adequate implementation of the Health and Safety Plans and SESMPs of these complex's facilities and report all incidents that may occur during construction and operation of Noor-Midelt power plants to MASEN.

46. **Associated facilities.** The Project's associated facility, which is the 400 kV transmission line operated in Phase 1 at 225 kV under the responsibility of ONEE, has potential environmental and social impacts, which include land disturbance/land use impacts; impacts to soil, water and air resources; impacts to wildlife, especially birds; visual, socioeconomic and environmental. ONEE Is presently preparing an ESIA/ESMP for this transmission line.

[20] BirdLife in South Africa: Guidelines to minimize the impact on birds of Solar Facilities and Associated Infrastructure in South Africa

(http://www.birdlife.org.za/images/stories/conservation/birds_and_wind_energy/solar_power.pdf)

47. **Safeguards documentation.** The FESIA covers all of the Noor-Midelt solar power sites and the different solar technologies (CSP parabolic trough, solar tower, PV and PV concentrated) under consideration by MASEN. The FESIA was prepared in a participatory manner including all required stakeholder consultation. The FESIA includes a description of: (i) the legal and regulatory framework applicable to the plants, (ii) applicable IFI environmental and social, health and safety policies, alternative options considered, (iii) a state of the environment at the plants' location and surrounding region, (iv) potential impacts and associated compensation measures to be considered, and (v) a Framework Environmental and Social Management Plan (FESMP). The FESMP includes institutional settings, general mitigations measures, monitoring plan and responsibilities for the mitigation and management of the potential impacts from the plant's activities during construction and operation. The FESMP will be used for the construction and operation of the common infrastructure: upgrading of the access road, bride, water intake, water pipeline, raw water treatment plant.

48. The FESIA will guide the preparation, adoption, implementation and monitoring of the Specific Environmental and Social Impact Assessments (SESIAs) for each adopted solar technology, which, as noted above, are to be prepared and implemented by the bidders for each of solar power plants located on the Noor-Midelt site, once their initial designs are determined. The SESIAs will include a detailed CESMP in accordance with the provisions of the FESIA, including the processes, rules and standards defined in the FESIA, and will be subject to the Bank's review and concurrence before its final approval, disclosure and implementation by MASEN and the Developer.

49. After the SESIAs' review and disclosure in-country and on the Bank's website prior to the start of construction, the Developers and the Contractors will contract qualified environmental and social safeguards specialists, as well as qualified health and safety coordinators, with international project experience, who will have direct responsibility for implementing the agreed environmental, health and safety measures at the Midelt plants' site during construction and operation. The Health and Safety specialists need to be OHSAS 18001;2007 or similar certified. These coordinators will, inter alia, prepare a monthly Health, Safety and Environment report during the construction and operation phases of Noor-Midelt, and MASEN will provide a summary of this information for the Bank's review during the supervision phase of the proposed Project.

50. **Associated Facilities.** Supervision of the implementation of the ESIA and their ESMP for the Associated Facilities, which is a 400 kV Transmission Line operated in Phase 1 at 225 kV, will be carried out by ONEE, which is responsible for completing and managing these facilities. The ESIA is presently under preparation and will be approved and disclosed by the Bank prior to Board approval.

51. **Implementation Capacity**. MASEN has a department within its organization to monitor development and implementation of the Performance Standards, and health and safety aspects of the Noor-Midelt Complex. MASEN will ensure that staff in this department possesses the relevant expertise to supervise implementation by the Developers and Contractors of all environmental and social impact mitigation measures, including occupational, health and safety measures, in compliance with the provisions of the FESIA and the CESMPs.

52. MASEN's Sustainable Development Department is staffed with qualified personnel in charge of the implementation of the safeguards and health and safety aspects of the Noor-Midelt Complex. The

Developer and the Contractors will similarly employ qualified staff to adequately manage the adequate implementation of the SESMPS and Health and Safety Plans. The Bank will review the CVs and provide a no-objection for these specialists.

53. **Grievance Mechanism.** A Grievance **Mechanism** for communities and all other complaints, and a separate grievance mechanism for contractor employees will be put in place and communicated to stakeholders in a simple and effective manner to ensure all community members, including women, men and the rural poor, have the information they need to understand the importance of the GRM and how to submit feedback. Details of the GRM, including addresses and phone numbers, are included in the LAPs and FESIA. A GRM is being established, including on-site presence and access to staff in MASEN's headquarters, and has been made public through the published LAPs and the FESIA, and will be included in the site-specific ESIAs. Any training of personnel on the GRM should include a gender-sensitive component to ensure responses to female and male complaints are treated fairly and equitably.

(c) **Safeguards Policies Triggered**

54. The main project will apply the Performance Standards under OP 4.03, while the 140 km 400 kV transmission line will apply safeguard policies: OP 4.01 for Environmental Assessment and OP 4.12 for Involuntary Resettlement.

(d) Dam Safety aspects of the Hassan II Dam

55. **The Dam Safety aspects of the Hassan II Dam will be addressed under Performance Standard PS4. The Noor-Midelt's water requirements will be satisfied from the existing Hassan II Reservoir, which is located 11 km away from the Project site**. To this end, a 11-km long water pipeline from the dam to the site of the Noor-Midelt Complex will be constructed by MASEN. The plants' performance will depend on availability of water and performance of the dam. Failure of the dam or misuse of the water from this dam may have adverse results on the plants' operation. A study is ongoing to assess the impact of climate change on water availability, as well as sedimentation within the reservoir. The Bank's policy OP 4.37 on Dam Safety is triggered. The World Bank requested the latest Dam Safety Report of the dam.

56. **The Hassan II Dam is managed by the Moroccan Hydraulics Administration in accordance with the requirements of Moroccan law**. As it is the practice in Morocco, the dam is equipped with a testing and monitoring network. To ensure consistent maintenance of the dam's parts and with the aim of prolonging the life of dams the Hydraulic Administration has, since the 1980s, been using preventive maintenance. The latest detailed auscultation analysis for the dam is not known.

57. **Morocco has a comprehensive framework in place to safeguard the safety of its dams. Dam safety is governed by the Water Act 10-95**. Section 16 of this Act requires the preparation of an Integrated Water Resources Development Executive Plan (*Plan Directeur d'Aménagement Intégré des Ressources en Eau* - PDAIRE) which is prepared by the **administration** for each watershed or set of water basins. Its main objective is the management of water resources of the water basins, including estuary waters, to ensure both quantitatively and qualitatively, present and future water needs, of different water users of the water basin. The PDAIRE defines, among other actions, the necessary operations for the mobilization, the

distribution, the protection, the restoration of water resources and the public water domains, including hydraulic structures.

58. Morocco has implemented a system for the dams' monitoring and maintenance under the guardianship of the hydraulic basin agencies. The latter are organized to mobilize the necessary resources (human, technical and material) to ensure comprehensive inspections and assessments of the dams' safety. Monitoring is documented monthly for each dam in an inspection report which reflects the evolution of each hydraulic or mechanical phenomenon and also tracks the state and behavior of the dam. Moroccan regulation therefore seems to have developed procedures and means acceptable for dams' review and monitoring.

Monitoring and Evaluation

59. MASEN will regularly monitor implementation of Noor-Midelt Phase 1 by the SPC(s) in accordance with the agreed contractual obligations that will be put in place prior to making any disbursements from the CTF and IBRD loans. PDO level results indicators and intermediate indicators will be monitored by MASEN and reported to the World **Bank** and other IFIs in project reports covering a period of one calendar semester. MASEN will submit the project reports to the Bank 45 days after the end of each calendar semester. The reports will cover, among other things, financial statements, physical progress, and procurement.

60. The legal **agreements** provide for periodic submission of interim unaudited financial reports, supported by a technical audit report prepared by an independent verification expert. The audit report will particularly focus on (i) achievement of milestones set out in the relevant engineering, procurement, and construction (EPC) contract and (ii) compliance with the contract's pricing provisions.

61. The Bank, in co-ordination with the other lenders, will hold regular meetings (bi-annually during construction and annually thereafter) to address implementation issues, and, in particular, to review the implementation progress of the environmental management plan.

Role of Partners

62. The Project is implemented **through** a partnership between MASEN and competitively selected consortia. Similarly to previous CSP Projects, the prequalification process for Noor-Midelt Phase 1 indicated strong interest by industry players, developers and other stakeholders.

63. Financing is provided by several IFIs. Donors have been coordinating review of the various Project elements during preparation, **dealing** with issues arising from incompatibility of the donors' rules and procedures. It is expected that cooperation between the donors would continue during Project implementation, continuing the course of dealings established on Noor-Ouarzazate where supervision missions are undertaken jointly.

I. Implementation Support Plan

64. The implementation support plan has been conceived based on the design and the risk profile of the project. It aims at providing sufficient technical support to MASEN and the relevant SPCs, to ensure fiduciary compliance with World Bank guidelines and to adequately carry out the risk mitigation measures. More precisely, the strategic approach for implementation support includes the following:

A. ***Technical Audits***: an independent verification agent will conduct technical audit of the Noor-Midelt I and II plants.

B. ***Financial Management***: Supervision of project financial management will be performed applying a risk-based approach. The supervision will review the project's financial management system, including but not limited to accounting, reporting and internal controls. MASEN will continue to use its financial management and disbursement manuals that were prepared for the Noor-Ouarzazate projects. New manuals will be developed for the new SPCs for Noor-Midelt I and II in line with acceptable Bank standards.

C. ***Procurement:*** The Project Sponsor contracts anticipated in this project are subject to prior review. Implementation support will include: (a) reviewing procurement documents and providing timely feedback to MASEN; and (b) providing detailed guidance on Bank Procurement Guidelines to MASEN; and (c) monitoring procurement progress against the detailed Procurement Plan.

D. ***Environmental and Social Safeguards***: The Bank team will supervise the implementation of the agreed SESMPs and Land Acquisition Plans (LAPs) for the project; and ensure compliance with World Bank Performance Standards and applicable Safeguards Policies. The implementation arrangements are as follows:

- The Contractors prepare and implement their own CESMP and Health and Safety Plan (H&S Plan) and employ qualified staff for this purpose. Contractors report on a monthly and quarterly basis to the Developer on CESMP and H&S implementation.

- The Developer supervises the adequate preparation and implementation of the CESMPs and H&S Plans and employs qualified staff for this purpose. The Developer reports on a monthly and quarterly basis to MASEN on CESMP and H&S issues.

- MASEN has the overall responsibility for the supervision of the adequate preparation and implementation of the CESMPs and H&S Plans and employs qualified staff for this purpose. MASEN reports on a semester basis to the IFIs on CESMP and H&S implementation, including on received grievances.

E. ***IPP Management***: Supervision of the IPP will be conducted during the PPP preparation, execution (e.g. construction of the plant) and operation. The nature of the supervision will vary depending on the phase of the project: during the PPP preparation (e.g. up until financial close) the supervision will focus on assessing all the elements of the project that could have an impact on the success of the PPP structure, including evaluation of the contractual documentation being

prepared for the PPP, evaluation of the economic and financial viability, assessment of the strength of the contractual structure, and evaluation of the risk allocation all with view to ensuring the sustainability and replicability of the project.. This will be done in close coordination with MASEN. During the execution and operation phase of the PPP, supervision will focus on ensuring that the contracts are being properly implemented, and to determine whether any additional risks are arising from the project implementation either at the SPC's or at MASEN's level.

F. ***Donor coordination***: The Bank team will ensure coordination of procurement procedures with other co financiers: AfDB, AFD, KfW, and EIB to facilitate implementation and avoid overburdening MASEN.

G. ***Governance mechanism***: MASEN will continue to use the governance risk management framework which it had developed as part of the effectiveness conditions for the Noor-Ouarzazate projects. The SPC (or SPCs) for the Noor-Midelt projects will develop new separate governance frameworks. The purpose is to support good governance and business ethics, enhance disclosure and transparency and reduce the risk of collusion, fraud and corruption. The risk management framework would cover the relationship between directors, officers, shareholders, employees, suppliers and the SPC and will be developed on the basis of four essential elements, namely: (1) risk assessment, (2) control activities, (3) information and communication; and (4) monitoring. This framework will include a code of conduct which would be aimed at ensuring the independence of MASEN's employees and reducing potential for conflicts of interest. The principal elements to be covered and essential risk mitigating measures would be as follows:

- Human Resource on-boarding procedures that will guide employee behaviors and which would introduce new employees to the organizational culture and ethical workplace values;
- Processes which allow for continuous dissemination and education of employees, on good ethical business practices and for obtaining internal feedback;
- Internal disclosure and authorization: due diligence mechanisms to require employees to disclose assets, outside and proprietary interests (at the time of hiring, and periodically during the term of an employee's tenure);
- Mechanisms to prevent conflicts of interest (segregation of duties, strong internal controls, polices on family members and relatives, gift policy);
- Complaint handling mechanisms for third parties to report allegations, e.g. ethics helpline;
- Accessibility of declaration and reports for internal and external review;
- Mechanisms to prevent, investigate, refer or sanction employee wrongdoing;
- Feedback mechanisms that would provide for periodic updates to the risk assessment and mitigating measures;
- Introducing fraud and corruption mitigation measures in standard bidding documents.

H. To help support this plan, the following Bank resources will be needed.

Time	Focus	Skills Needed	Resource Estimate	Partner Role
First twelve months	Contractual structure And documentation LAP implementation	PPP expertise Legal Social safeguards	20 SW annually 8 SW annually	
12-48 months	Implementation of EMP Contract implementation	Environmental PPP Power Engineer	6 SW 6 SW	
Other				

Skills Mix Required

Skills Needed	Number of Staff Weeks	Number of Trips	Comments
Task Team Leader	8 SW annually	Field visits as required	
Energy Specialist/ Operations Officer	6 SWs annually	2 trips annually, field visits as required	
Power Engineer/Solar energy specialist	6 SWs annually	2 trips annually, field visits as required	
Institutional and PPP Specialists	10 SWs annually	Between 2 to 6[21] trips annually	
Social Safeguards Specialist	3 SWs annually	Field visits as required	Country office based
Environmental Specialist	6 SWs annually during the first two years then 3 SWs annually	2 trips annually, field visits as required	
Procurement Specialist	6 SWs first year, then 2 SWs annually in following years	2 supervision missions annually Field visits as required	Country office support available
Financial Management Specialist	3 SWs annually		Country office based
Governance Specialist	2 SW annually first year, then 1 SW	1 trip annually as required	Function may be covered by FM specialist
Operational Support	4 SWs annually	Field visits as required	

[21] Until financial close a high level of supervision will be required (6 trips per year). This will be reduced to 3-4 trips annually during construction and 2 annual trips during operation.

ANNEX 3: MOROCCO - ELECTRICITY SECTOR ASSESSMENT

1. This Annex provides a discussion of the Moroccan electricity sector financial viability, tariffs, and broader energy sector institutional structure. The first section provides an overview of the national power system context. The second section presents the sector's institutional structure and reform agenda. Finally, the third section provides a detailed analysis of the sector's financial viability through an assessment of the two utilities directly involved in this project: (i) ONEE, as the operator of the transmission grid, sole buyer of bulk power and ultimate buyer of the electricity produced by Noor-Midelt solar plants, and (ii) MASEN, as the borrower, project sponsor and off-taker of the energy generated by Midelt solar plants. Finally

I. Overview of Morocco's National Power System

2. Demand for electricity has grown steadily throughout the period 1995-2015, with an annual average growth rate of 5.5 percent and peaks of growth in excess of 8 percent. In 2015, total electricity sales reached to 29,404 GWh. Demand growth is driven by the economic development of the country, especially large and medium industry, new housing construction, agriculture and the electrification of the rural zones under the Global Rural Electrification Program (PERG). The power load curve in Morocco is typical of a developing country with a mild climate and a relatively low contribution of the industrial sector to its GNP. The load curve peaks in the evening between 20:00 and 23:00. However, a review of recent historical data indicates the emergence of an increasingly important daylight peak around noon, in summer months.

3. In 2015, Morocco recorded a peak demand of 5,860 MW, in particular due to the increased use of air conditioning during summertime,[22] 50 percent of electricity demand is met through coal-fired units while natural gas fired units and imports from Spain cover more than 30 percent of supply.[23]

4. For the last 25 years, the power generation sector in Morocco has seen a dramatic shift from a situation where more than 95 percent of total electricity supply was generated by ONEE's own generation plants, to a configuration where the contribution of the latter's generation facilities is below 30 percent. This trend is going to amplify in the next five years with the addition of new capacities developed by the private sector.

5. For the last 15 years, a successful rural electrification program has increased access to electricity from 55 percent to 99 percent of the population. This rapid and successful expansion of the network might have contributed to significant grid losses, which are higher than in benchmark countries.

6. Morocco's electricity grid is interconnected with the grids of other Maghreb neighbouring countries (Algeria and Tunisia) and the European network (ENTSO-E) since 1997. However, trade between the Maghreb countries remains very low. On the other hand, trade with Spain is significant and stable with imports by Morocco accounting for almost 15 percent of its electricity needs.

[22] The maximum load reached 6,050MW in 2016

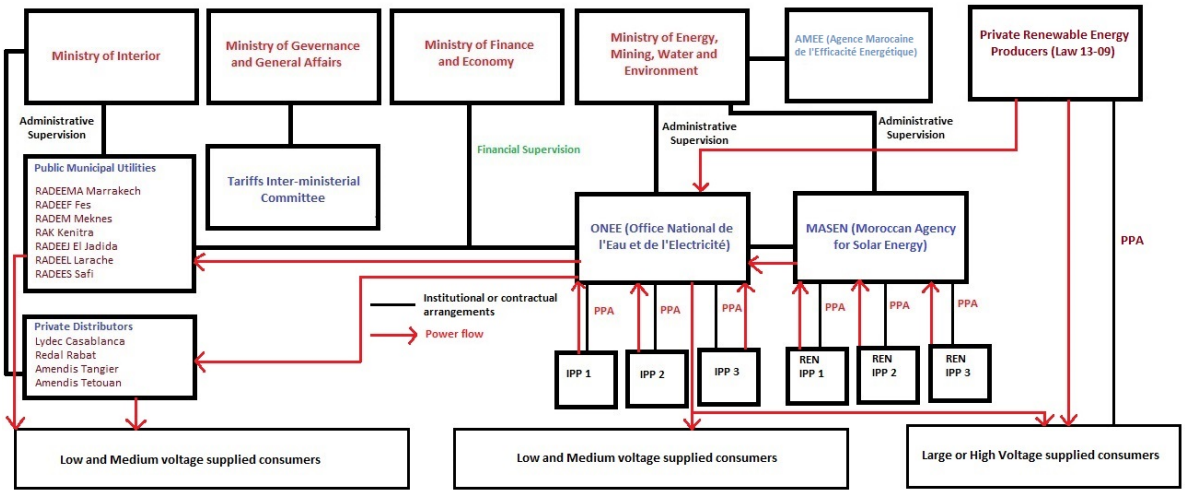
[23] Hydroelectricity contribution does not include pumped storage generation.

7. While ONEE is in charge of power distribution in most of the cities and the whole rural regions of the country, there are 11 other electricity distribution entities, 7 public municipal utilities and 4 private concession-holders. With its 5.6 million clients, ONEE serves, by far, the largest number of consumers. In 2015, ONEE's share in total electricity sales was 60 percent. The second largest distribution utility is LYDEC which delivers electricity in Casablanca and Mohammedia to slightly less than 1 million consumers. REDAL, in charge of distribution in Rabat-Salé, has 0.6 million customers.[24]

II. Institutional Structure and Recent Reforms

8. The diagram below illustrates the organisational structure of the Moroccan Power Sector. While the political agenda is driven by the Ministries of Energy (MEME), Finance (MEF) and Interior (MI), the two state-owned utilities that dominate the sector are actively involved in designing sector policies.

Figure 1: Electricity Sector Organization Chart



a. Structure and development of the electricity sector

9. With the creation of ONE in 1963, the task of electricity production, transmission and distribution in small-towns and remote areas of the country was assigned to a state owned, vertically integrated utility. Meanwhile, 11 municipal electricity distribution companies were created in some urban centres to offer some core public services, including electricity distribution.

10. Until the mid-1990s, there was relatively little change in power sector legislation and organisation, despite a rapid growth of electricity demand and the very limited success of previous government attempts to improve access to electricity, especially in rural areas. Starting from 1994, the government introduced a series of reforms and directives to open up electricity generation and distribution activities

[24] 2015 figures from the DRSC annual report (Direction des Régies et Services Concédés, Ministry of Interior).

to the private sector, expand the regional integration of the country's power system, and initiate a vast and ambitious rural electrification program.

11. In 2011, ONE was merged with ONEP (the state owned water utility). The new legal entity resulting from the merger of ONEP and ONE is named the Office National de l'Electricité et de l'Eau potable (ONEE). After the merger, ONEE kept a Water Department ("ONEE-Branche Eau) and an Electricity Department ("ONEE-Branche Electricité). Changes induced by the merger were very limited to creating the new legal entity and did not entail any modifications in the organization structures of both entities. Financial accounts are still separated on an operational basis and essentially merged for financial reporting purposes.

12. In May 2014, to alleviate the poor state of finances of ONEE while simultaneously pushing the utility to improve its operational performances, the Government approved a Financial Restructuring Plan, to help the Office overcome a long-running precarious state of affairs. It focuses on tariff rate revisions, supplemented with an increase in capital and an active help to collect receivables from former municipal utilities, public administrations and municipalities. The plan also included a lump-sum payment to ONEE as a one off flat subsidy for fuel oil used in electricity production to pave the way for a complete phase-out of all forms of oil subsidies.

13. While the restructuring scheme brought an immediate improvement in the liquidity position of ONEE, it would be difficult to ascertain if this will lead to a structural change in the financial health of the utility. That would be contingent upon the commitment of the Office to performance-linked measures and a continuing support from the Government. The Plan was not used as an opportunity to push for structural sector reforms because of the complex negotiations involved and the urgency for short-term actions.

b. Renewable energy development

14. In 2009, Morocco announced ambitious renewable energy targets for 2020. Formal plans include the installation of a total of 2GW of wind and 2GW of solar power generation capacity by 2020 – bringing renewable energy capacity in power generation to 42 percent of the total power generation capacity. In addition, Morocco's submission to the UNFCCC as part of its INDCs includes the objective to reach 52 percent of installed electricity generation capacity from renewable sources by 2030. To achieve these objectives, the government decided to create a dedicated governmental agency: the Moroccan Agency for Sustainable Energy (MASEN), in charge of implementing the Moroccan Renewable Energy Strategy[25].

15. ONEE was required by law to transfer all of its renewable energy assets to the newly renamed entity. The Government decision to entrust the task of clean energy projects development to one unique agency aims at emphasizing the role of renewable energy in the future sector development and fast-track the implementation of the country's targets in terms of the overall share of renewables in power

[25] MASEN was created in 2010 as an agency in charge of implementing the Moroccan Solar Energy Plan before seeing its prerogatives extended in 2015 to cover all types of renewable energy technologies.

generation. Much remains to be established regarding the institutional relationship between ONEE and MASEN, and the role of the latter in energy planning and policy making.

16. With the 2010 Renewable Energy Law (Law 13-09), Morocco set out a legislative framework for the promotion of renewable investments, establishing a procedure for the authorisation of renewable energy installations as well as production, distribution and trade; thereby opening a new market segment in which certain industrial customers are allowed to freely choose their electricity suppliers. In 2015, the scope of the renewable energy law was further widened to power distribution networks. Private renewable energy developers are now allowed to connect their generation facilities to the medium voltage grid and were given access, albeit under some restrictions, to the end users.

17. Although, this framework was considered to be a turning point in the history of the Moroccan power sector and was well received by private investors and power projects developers, its impact is still minor. A number of regulatory texts for the implementation of the provisions of the aforementioned framework are either not enforced or still in preparation. The pool of consumers eligible to enter into purchase agreements with private producers is very limited and provisions were included in the law to cover any resulting losses for private distributors.

18. As a result of the new strategy, the establishment of a National Electricity Regulatory Authority (ANRE) was announced in a new law. This new body will be entrusted with the role of overseeing the competitive and transparent functioning of the renewable energy law and market, in the interest of developers and legacy operators. The prerogatives of this new authority, however, are limited and not expected to impact the overall functioning of the power sector.

c. Sector regulation and tariffs

19. In 2016, Morocco adopted a law to introduce an independent energy regulator (*Agence Nationale de Régulation de l'Energie* – ANRE), detailing its functions, missions and organization. The role conferred to this new authority will be confined to policing the power generation regime introduced under the renewable energy law. The law is also paving the way to a separation of ownership and operations of grids from power generation and sales to end-users' activities. This cautious approach to the introduction of an independent regulation authority is considered to be more realistic than pursuing a body with wider prerogatives in an environment where the political establishment is not necessarily favoring an active independent authority.

20. The electricity tariff structure is set by a central governmental department and is designed with the dual objective of keeping the cost of energy low for a large spectrum of consumers (social tariffs), and ensuring financial returns for distributors regardless of their size, region or client type. While the government did succeed in completely phasing out subsidies on petroleum products, electricity tariffs adjustments are not frequent and involve a lengthy and tedious bargaining process. This means that cost-recovery requirements are traded against the need to preserve household purchasing power and industrial competitiveness, and to ensure sufficient revenues for municipal distributors to cover other loss-making activities (water and sanitation). The last major tariff adjustment was introduced in 2014 after a 4-year consultation and an urgent need to restore ONEE's financial viability.