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Report No: PAD3479

INTERNATIONAL DEVELOPMENT ASSOCIATION

PROJECT APPRAISAL DOCUMENT

FOR A

GRANT

IN THE AMOUNT OF US\$14 MILLION

FROM THE TRUST FUND FOR GAZA AND WEST BANK (TFGWB)

WITH CO-FINANCING FROM THE PARTNERSHIP FOR INFRASTRUCTURE DEVELOPMENT MULTI-DONOR TRUST FUND (PID-MDTF) IN THE AMOUNT OF US\$49 MILLION

TO THE

PALESTINIAN LIBERATION ORGANIZATION
(FOR THE BENEFIT OF THE PALESTINIAN AUTHORITY)

FOR

PHASE I OF THE MULTIPHASE PROGRAMMATIC APPROACH

ADVANCING SUSTAINABILITY IN PERFORMANCE, INFRASTRUCTURE, AND RELIABILITY OF
ENERGY SECTOR IN THE WEST BANK AND GAZA (ASPIRE WB&G)

April 2, 2020

Energy and Extractives Global Practice
Middle East and North Africa Region

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CURRENCY EQUIVALENTS

(Exchange Rate Effective March 23, 2020)

Currency Unit = Israeli New Shekel

US\$1 = ILS3.60

FISCAL YEAR

January 1 – December 31

ABBREVIATIONS AND ACRONYMS

AMI	Advanced Metering Infrastructure
CAPEX	Capital Expenditure
CoP	Community of Practitioners
DISCO	Distribution Company
EE	Energy Efficiency
E&S	Environmental and Social
EIRR	Economic Internal Rate of Return
ESF	Environmental and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMF	Environmental and Social Management Framework
ESS	Environmental and Social Standard
FHH	Female-Headed Household
FM	Financial Management
GEDCO	Gaza Electricity Distribution Company
GHG	Greenhouse Gas
GENRP	Gaza Electricity Network Rehabilitation Project
GPP	Gaza Power Plant
GoI	Government of Israel
HEPCO	Hebron Electricity Production Company
IEC	Israeli Electricity Company
IFR	Interim Financial Report
IMOF	Israeli Ministry of Finance
IPP	Independent Power Producer
IRR	Internal Rate of Return
JDECO	Jerusalem District Electricity Company
L/C	Letter of Credit
LGU	Local Government Unit
LMP	Labor Management Procedure
M&E	Monitoring and Evaluation
MFD	Maximizing Finance for Development
MOF	Ministry of Finance
MSMEs	Micro, Small and Medium Enterprises
NEDCO	Nablus Electricity Distribution Company
NPV	Net Present Value



OHS	Occupational Health and Safety
OPEX	Operational Expenditure
PA	Palestinian Authority
PCBS	Palestine Central Bureau of Statistics
PDO	Project Development Objective
PENRA	Palestinian Energy and Natural Resources Authority
PERC	Palestinian Electricity Regulatory Commission
PESIA	Preliminary Environmental and Social Impact Assessment
PETL	Palestine Electricity Transmission Limited
PMU	Project Management Unit
POM	Project Operations Manual
PPA	Power Purchase Agreement
PPSD	Project Procurement Strategy for Development
PrDO	Program Development Objective
PV	Photovoltaic
RAP	Resettlement Action Plan
RPF	Resettlement Policy Framework
RPP	Revenue Protection Program
SAACB	State Audit and Administrative Control Bureau
SCADA	Supervisory Control and Data Acquisition
SELCO	Southern Electricity Company
SEP	Stakeholder Engagement Plan
SMEs	Small and Medium Enterprises
SOE	Statement of Expenditure
STEP	Systematic Tracking of Exchanges in Procurement
TEDCO	Tubas District Electricity Company
T&D	Transmission and Distribution
WB&G	West Bank and Gaza

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DATASHEET

BASIC INFORMATION

Country(ies)	Project Name	
West Bank and Gaza	Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza	
Project ID	Financing Instrument	Environmental and Social Risk Classification
P170928	Investment Project Financing	Substantial

Financing & Implementation Modalities

<input checked="" type="checkbox"/> Multiphase Programmatic Approach (MPA)	<input type="checkbox"/> Contingent Emergency Response Component (CERC)
<input type="checkbox"/> Series of Projects (SOP)	<input checked="" type="checkbox"/> Fragile State(s)
<input type="checkbox"/> Disbursement-linked Indicators (DLIs)	<input type="checkbox"/> Small State(s)
<input type="checkbox"/> Financial Intermediaries (FI)	<input type="checkbox"/> Fragile within a non-fragile Country
<input type="checkbox"/> Project-Based Guarantee	<input checked="" type="checkbox"/> Conflict
<input type="checkbox"/> Deferred Drawdown	<input type="checkbox"/> Responding to Natural or Man-made Disaster
<input type="checkbox"/> Alternate Procurement Arrangements (APA)	

Expected Project Approval Date	Expected Project Closing Date	Expected Program Closing Date
23-Apr-2020	28-Dec-2028	28-Dec-2028
Bank/IFC Collaboration	Joint Level	
Yes	Complementary or Interdependent project requiring active coordination	

MPA Program Development Objective

Improve operational and financial performance of energy sector institutions and diversification of energy sources

MPA Financing Data (US\$, Millions)



The World Bank

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza (P170928)

MPA Program Financing Envelope

200.00

Proposed Project Development Objective(s)

To improve operational and financial performance of electricity sector institutions and diversification of energy sources in the West Bank and Gaza.

Components

Component Name	Cost (US\$, millions)
Component 1: Improving Infrastructure for Regional Electricity Interconnections in the West Bank and Gaza	13.00
Component 2: Improving Sustainability of Service Delivery in West Bank and Gaza DISCOs	7.00
Component 3: Enabling Private Sector Engagement in Renewable Energy	34.00
Component 4: Technical Assistance, Capacity Building and Project Management	9.00

Organizations

Borrower: Ministry of Finance

Implementing Agency: Palestinian Energy and Natural Resources Authority (PENRA)

MPA FINANCING DETAILS (US\$, Millions)

MPA Program Financing Envelope:	200.00
of which Bank Financing (IBRD):	0.00
of which Bank Financing (IDA):	0.00
of which other financing sources:	200.00

PROJECT FINANCING DATA (US\$, Millions)

SUMMARY

Total Project Cost	63.00
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The World Bank

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza (P170928)

Total Financing	63.00
of which IBRD/IDA	0.00
Financing Gap	0.00

DETAILS

Non-World Bank Group Financing

Trust Funds	63.00
Partnership for Infrastructure Development MDTF	49.00
Special Financing	14.00

Expected Disbursements (in US\$, Millions)

WB Fiscal Year	2020	2021	2022	2023	2024	2025
Annual	0.02	24.98	12.72	16.37	6.36	2.54
Cumulative	0.02	25.01	37.73	54.10	60.46	63.00

INSTITUTIONAL DATA

Practice Area (Lead)

Energy & Extractives

Contributing Practice Areas

Environment, Natural Resources & the Blue Economy, Poverty and Equity, Infrastructure, PPP's & Guarantees

Climate Change and Disaster Screening

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

SYSTEMATIC OPERATIONS RISK-RATING TOOL (SORT)

Risk Category	Rating
1. Political and Governance	● High
2. Macroeconomic	● High



The World Bank

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza (P170928)

3. Sector Strategies and Policies	● Substantial
4. Technical Design of Project or Program	● Moderate
5. Institutional Capacity for Implementation and Sustainability	● Moderate
6. Fiduciary	● High
7. Environment and Social	● Substantial
8. Stakeholders	● Low
9. Other	● Substantial
10. Overall	● High
Overall MPA Program Risk	● High

COMPLIANCE

Policy

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

☐ Yes ☒ No

Does the project require any waivers of Bank policies?

☐ Yes ☒ No



Environmental and Social Standards Relevance Given its Context at the Time of Appraisal

E & S Standards	Relevance
Assessment and Management of Environmental and Social Risks and Impacts	Relevant
Stakeholder Engagement and Information Disclosure	Relevant
Labor and Working Conditions	Relevant
Resource Efficiency and Pollution Prevention and Management	Relevant
Community Health and Safety	Relevant
Land Acquisition, Restrictions on Land Use and Involuntary Resettlement	Relevant
Biodiversity Conservation and Sustainable Management of Living Natural Resources	Relevant
Indigenous Peoples/Sub-Saharan African Historically Underserved Traditional Local Communities	Not Currently Relevant
Cultural Heritage	Not Currently Relevant
Financial Intermediaries	Not Currently Relevant

NOTE: For further information regarding the World Bank’s due diligence assessment of the Project’s potential environmental and social risks and impacts, please refer to the Project’s Appraisal Environmental and Social Review Summary (ESRS).

Legal Covenants

Sections and Description

Sections 1.B and 1.C of Schedule 2

1. To facilitate the carrying out of Part 3(b)(i) of the Project, the Recipient, through the PA, shall cause PENRA to enter into an agreement with each Participating Regulated Distributor (“Participating Regulated Distributor Agreements”), with terms and conditions approved by the Bank.
2. The Recipient shall cause PENRA to maintain the PENRA-GEDCO Agreement, under the terms and conditions originally agreed and except as the Recipient shall otherwise agree, the Recipient shall not assign, amend, abrogate or waive the PENRA-GEDCO Agreement or any of its provisions.
3. The Recipient, not later than 30 days after the Effective Date, shall create and thereafter maintain, during the design phase of the LSA, a committee (“LSA Design Committee”) composed by representatives of key agencies, including MoF, PENRA, and PETL, with support from experts and engaging with all energy sector and private sector



stakeholders including commercial banks, all under terms of reference acceptable to the Bank, for the purposes of designing the processes and procedures for a sector-wide payment system

4. The Recipient shall cause PENRA together with the LSA Design Committee to develop a manual (“Liquidity Support Account and Payment System Operations Manual or LSAPS”) containing specific provisions for the set up and operation of the Liquidity Support Account

5. For the purposes of starting the pilot referred to in Part 3(c) of the Project, the Recipient, through the Palestinian Authority shall, in accordance with the LSAPS Operational Manual, to: (a) ensure that the LSA is at all times governed by a management board composed by professionals with qualifications and experience satisfactory to the Bank, and have the legal capacity and autonomy to exercise control over the use of the funds assigned to the LSA, as set forth in the LSAPS Operations Manual; and (b) establish and maintain a separated dedicated account for the LSA.

6. The Recipient shall review with the Bank, no later than twenty four months after the LSA becomes operational, or any later date as agreed by the Bank, the operation of the LSA under Part 3(c) of the Project for the purposes of assessing the operation of said LSA and to determine a framework for the future operation and/or winding down of the LSA, as the case may be, in accordance with procedures and under a time frame acceptable to the Bank.

Conditions

Type	Description
Effectiveness	The execution and delivery of the Grant Agreement on behalf of the Recipient has been duly authorized or ratified by all necessary governmental and corporate action.
Type Effectiveness	Description The Subsidiary Agreement referred to in Section I.B of Schedule 2 to the Grant Agreement has been executed on behalf of the Recipient and the PA.
Type Effectiveness	Description The On-Granting Agreement referred to in Section I.B of Schedule 2 to this Agreement has been executed on behalf of the Palestinian Authority and the PENRA.
Type Effectiveness	Description The Project Operational Manual, acceptable to the Bank, has been adopted by the Recipient.



Type Effectiveness	Description The PID-MDTF Grant Agreement has been executed and delivered and all conditions precedent to its effectiveness have been fulfilled.
Type Disbursement	Description Specific to Grant Agreement for PID-MDTF: Notwithstanding the provisions of Section 3.01 of this Agreement, no withdrawal shall be made for payments under Category (2) unless the Recipient and PENRA have submitted evidence satisfactory to the Bank that: (i) the LSAPS Operations Manual has been prepared in a manner satisfactory to the Bank and adopted by the Recipient; and (ii) the dedicated account for the Liquidity Support Account referred to in Section C.3(b) of Article 2.03 of Annex 1 to the Grant Agreement has been opened in a manner acceptable to the Bank.
Type Disbursement	Description Specific to Grant Agreement for TFGWB: Notwithstanding the provisions of Part A , no withdrawal shall be made for payments made prior to the date of this Agreement, except withdrawals up to an aggregate amount not to exceed \$ 2,000,000 may be made for payments made twelve months prior to the date of this Agreement, for Eligible Expenditures under Category (1) of the Project.



I. STRATEGIC CONTEXT

A. Country Context

1. **The political situation in the West Bank and Gaza (WB&G) remains uncertain as the economic momentum falters.** After two strong quarters at the end of 2018, preliminary data by the Palestine Central Bureau of Statistics (PCBS) show that the growth of real gross domestic product in the West Bank & Gaza contracted in the first two consecutive quarters of 2019. Specifically, quarter-on-quarter growth was –2.5 percent in the first quarter of 2019 followed by –2 percent in the second quarter. As a result, the economy is technically in a recession. The decline was driven by a drop in private and public consumption and in investment.¹ The Palestinian economy has been driven by large inflows of transfers as other sources of growth have been long hindered by the ongoing restrictions on movement and access. Looking forward, growth was expected to slowly recover and average around 2.5 percent in the coming years; however, the outbreak of COVID-19 has significantly heightened risks associated with this outlook and points to lower short term growth, a reduction in per capita income, and a rise in unemployment². Inflows of transfers have significantly dropped in recent years, making it more pressing to unlock private sector growth, even though constrained by a difficult business environment.

2. **Unemployment has continued to be high and poverty rates have increased.** The unemployment rate reached 24.6 percent in the third quarter of 2019. This headline story, however, masks the regional divergence. In Gaza, 45.1 percent of those in the labor force were unemployed in the third quarter of 2019. This is an increase of 2 percentage points over the 2018 average. The situation in the West Bank has been different with the unemployment rate stagnating at around 17 percent over recent years, but it has dropped to 13.3 percent in the third quarter of 2019 as a result of an increase in the number of persons employed in Israel.³ The gap in poverty levels between the West Bank and Gaza has increased substantially, with 46 percent of Gaza below the US\$5.5 per day poverty line compared to 9 percent in the West Bank in 2016–17.⁴

3. **The standoff over clearance revenues seems to be largely over easing the fiscal stress, but the situation remains dire.** Following a six-month period of cessation of clearance revenues,⁵ the Palestinian Authority (PA) has started reaccepting these transfers in August 2019.⁶ With the resumption of these transfers, the PA's ability to manage cash flow has improved significantly. However, the fiscal situation

¹ However, comparing the first half of 2019 with the same period of 2018, the Palestinian economy registered a growth of 3.1 percent with the West Bank expanding 3.6 percent and Gaza growing by 1.4 percent. It is important to note, however, that to a large extent, this is a base effect as the first half of 2018 was a particularly weak period.

² World Bank COVID-19

³ Gender-based gaps in unemployment are stark, with female unemployment at 50 percent compared to male unemployment at 25 percent.

<http://www.pcbs.gov.ps/Downloads/book2433.pdf> (accessed October 27, 2019).

⁴ When considering nonmonetary measures of poverty, 58 percent of female-headed households (FHHs) compared to 41 percent of male-headed households are in the bottom 40 percent. (Atamanov, A., and N. Palaniswamy. 2019. "Analysis of Electricity Sector Using Local Government Performance Assessment Data.")

⁵ Value added tax and import duties collected by the Gol on behalf of the PA should be transferred monthly based on an arrangement instituted by the Paris protocol.

⁶ Differences between both sides on additional deductions by Israel on account of PA payments to prisoners, averaging around US\$12 million per month, continue to be unresolved.



remains difficult as public revenues collected in 2019 have been lower year on year while expenditures have increased. At the same time, foreign aid has declined significantly. As a result, the PA is expected to face a large fiscal gap which, if no additional donor financing is identified, will be financed through additional domestic arrears. Notably, the PA's deficit mainly emanates from Gaza while fiscal operations in the West Bank mostly break even.

4. **The Palestinian economy—with significant donor support—has proven resilient over years of potential economic catastrophe.** After a weak start in the first half of the year, growth in the Palestinian territories is estimated to be around 0.5 percent in 2019. Going forward, however, as some of the uncertainty with the resolution of clearance revenue standoff has been eliminated, growth is expected to slowly recover to around 2.5 percent in the medium term. In terms of upside, a robust reform agenda can help unlock private sector-led growth and job creation. The adoption of a modern Companies Law would make a substantial impact on the business environment—signaling to investors that WB&G creates a level playing field. Specifically, the proposed Companies Law⁷ would positively impact business start-ups by facilitating the incorporation and operation of companies, introducing new types of companies and shares, strengthening the rights of minority shareholders, and addressing corporate governance principles. In the energy sector—for which the private sector has expressed strong interest to invest—recently implemented reform measures are improving the perception of creditworthiness across the sector and independent power producers (IPPs) are considering investment opportunities in natural gas and solar photovoltaic (PV) energy across WB&G.

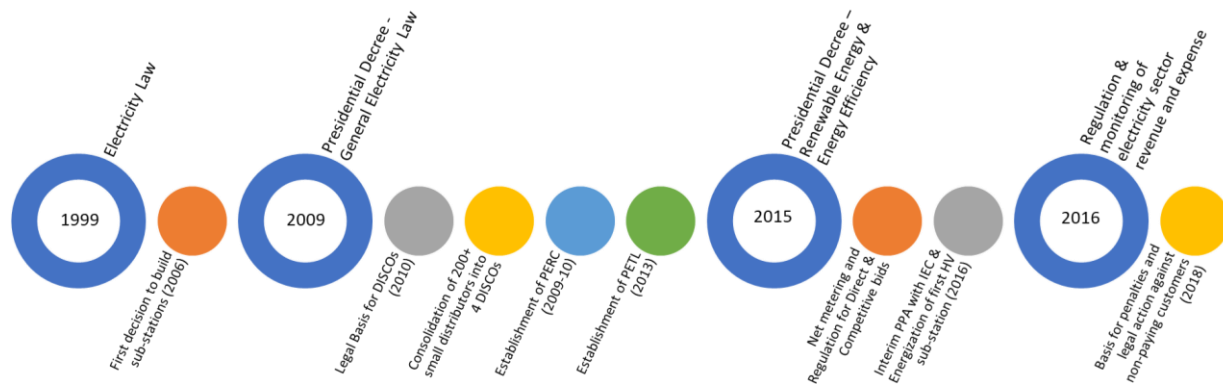
B. Sectoral and Institutional Context

5. **Over the last two decades, the electricity sector reform process has improved and consolidated the energy sector from a fragmented municipal-based system to a more efficient sector model.** The Palestinian Energy and Natural Resources Authority (PENRA) was originally established in 1995 with over 500 direct connections between villages and towns and the Israeli grid. As of 2018, over 80 percent of the total electricity supply in the West Bank has been consolidated into five distribution companies (DISCOs) and around 200 direct connections remain. PENRA continues its efforts to regularize the remaining 20 percent supply, which is largely managed by local government units (LGUs). Figure 1 provides a snapshot of the energy sector reforms between 1999 and 2018. The PA has pursued a series of reforms to create and operationalize the regulatory agency (Palestine Electricity Regulatory Commission, PERC) and the single buyer and transmission system operator (Palestine Electricity Transmission Co. Ltd., PETL) and to implement policy measures to improve financial discipline and encourage decentralized renewable energy. Geographical, operational, and financial fragmentation across the electricity supply chain continues to be a key constraint toward sustainability. Continued efforts are required to improve cohesion and sustainability across domestic generation sources, transmission and distribution (T&D) infrastructure, and service delivery to Palestinian customers.

⁷ This refers to the proposed Companies Law as of June 2019. Note that the law has gone through numerous iterations, and the World Bank has been supporting the PA to revise the law for maximal improvement to the business environment.



Figure 1. Electricity Sector Reforms in WB&G



Note: HV = High voltage; IEC = Israeli Electricity Company; PPA = Power Purchase Agreement.

6. **Achieving electricity sector cohesion presents a unique and complex challenge as the Palestinian and Israeli electricity sectors are deeply intertwined.** Imports from Israel account for more than 90 percent of electricity supply in the West Bank and over half in Gaza. IEC provides the electricity supply through nearly 200 low- and medium-voltage interconnection points. These points provide electricity through the DISCOs and LGUs and each connection point is billed directly to the relevant DISCO or LGU. In addition, a few connection points directly serve private, mostly industrial, customers who are also billed directly. Currently, the supply is entirely managed by IEC with minimal commercial and service quality agreements with limited ability of PETL and DISCOs/LGUs to monitor and manage the quantity and quality of supply. All areas across the West Bank suffer from power shortages, with increased incidences of load shedding and poor quality of available supply. Shortage in Gaza is particularly severe. Four high voltage substations have been constructed across the West Bank to streamline and manage power purchase from IEC. The first high voltage substation was energized in 2017 with the signing of an interim PPA and PETL's experience has confirmed the benefit of such an arrangement. Strengthening the role of PETL is essential to accelerate the pace of consolidation and streamlining in the sector.

7. **Financial creditworthiness is crucial for the energy sector to ensure continual improvements in service delivery and attract private sector interest.** This requires payment discipline across the sector to reduce non-payments and revenue losses. For years, Israeli Ministry of Finance deducts outstanding costs, including electricity bills, from the clearance revenue, which has resulted in a mechanism known as 'net-lending'⁸. This mechanism has exacerbated the lack of payment discipline by systematizing it. In September 2016, the PA and the GoI entered into an agreement to resolve past electricity sector debt. This set the stage for an interim PPA in July 2017, which was expected to be followed by a comprehensive, long-term PPA that would allow PETL to purchase electricity from IEC at a uniform price. In the meanwhile, as an initial step toward streamlining, PETL has set up a centralized billing system that allows monitoring of the bills issued by IEC to DISCOs and LGUs and payment records. PETL has also established a Unified

⁸ West Bank and Gaza - Assessment and Action Plan to Improve Payment for Electricity Services in the Palestinian Territories: Study on Electricity Sector Contribution to Net Lending, 2014.



Account to manage the interim PPA signed with IEC and the PPAs signed with two solar IPPs. These are showing early positive results and provide a blueprint for the sector.

8. Electricity sector debt continues to be a concern even as the West Bank DISCOs have seen revenue collection from general customers increase to nearly 90 percent. The urban areas served by DISCOs receiving supply from PETL report improved power quality and nearly 100 percent repayment. Recent decrees and regulations have strengthened the ability of DISCOs/LGUs to impose penalties on nonpaying general consumers. Across WB&G, revenue collection from general consumers (residential, commercial, and industrial) is 80–90 percent. However, DISCOs/LGUs are unable to enforce nonpayment-related penalties on consumers such as, public institutions, social assistance cases,⁹ and residents of refugee camps; or to penalize theft cases in areas with restricted access. The payment shortfall is further exacerbated by the lack of uniform application of the cost recovery tariffs and lack of transfer of subsidies. Improved revenue collection is only effective when it translates into timely and full payment to suppliers. As of December 2019, these issues were contributing to financial deficits of nearly US\$150 million per year due to clearance revenue deductions (net-lending) to cover for non-payment to IEC. In addition, the debt from Jerusalem District Electricity Company (JDECO), which is not part of the ‘net-lending’ mechanism, was around NIS 1 billion, despite over 90 percent collection rate from general customers. Recent efforts at debt management and repayment have created a unique opportunity for the sector to improve sector finances by reducing legacy debt and proactively lessening the accrual of new debt.

9. Electricity supply and revenue collection in Gaza pose a more complex set of challenges. In Gaza, the available power supply is limited to 6 to 12 hours a day, depending on electricity imports from Israel and operation of the Gaza Power Plant (GPP). Imports of electricity from Egypt have stopped since February 2018. Generation from the GPP is limited due to issues with fuel supply, fuel storage, and financial constraints. Since 2018, Qatar-financed fuel supply has temporarily increased power supply to 12–14 hours per day. Gaza Electricity Distribution Company (GEDCO) recovers approximately 55 percent of its total billed amount and is not paying for electricity and fuel purchases, which are fully subsidized by the PA and currently Qatar, respectively. To cope with the limited and unreliable supply, general customers with financial means purchase high-cost electricity (up to US\$1 per kWh) from neighborhood diesel generators. In addition, customers have also extensively adopted rooftop solar PV systems; 8–10 MWp is estimated to be currently installed. An unintended consequence of these broadly welcome developments is continued erosion of GEDCO’s customer base, creating an additional barrier to financial recovery. The recently prepared electricity master plan for Gaza proposes the introduction of high voltage (transmission) infrastructure, augmentation of the distribution network, and building of new gas- and solar-based generation facilities. This requires significant improvement in GEDCO’s ability and willingness to pay for energy purchases and concurrent strengthening of GEDCO’s managerial and technical capacity.

10. Imports of electricity could provide a unique and mutually beneficial opportunity in the subregion while enabling diversification of sources. PENRA’s vision for the longer term is to balance imports from Israel, Jordan, and Egypt and domestic generation in a manner that no single source accounts for more than 50 percent of the electricity demand. As the electricity system in WB&G is highly integrated with the Israeli electricity system, the addition of new generation or expanded imports requires

⁹ Among the vulnerable populations, nonpayment is more common among FHHs, with 25 percent reporting to have never paid for electricity connection compared to 11 percent of their male counterparts (Atamanov and Palaniswamy 2019).



close coordination with IEC, and in many instances, the approval of Israeli authorities. Imports from IEC could change in line with the ongoing transformation in the Israeli electricity sector toward privatization and open access. According to the Israeli regulator's projections, IEC's role will grow as a transmission system operator (TSO) with its share of generation capacity expected to reduce from 79 percent in 2018 (13.3 GW) to 44 percent (8.6 GW) in 2025. This will be complemented by an independent market operator, which is expected to be fully functional shortly. Newly operational Israeli gas fields are playing a major role in Israel and the region. Increase in imports from Jordan and Egypt is viable as both are facing potential excess capacity. Currently, Egyptian imports are constrained due to the security situation in the Sinai, and Jordanian imports require extensive cooperation with Israel in the Jordan Valley. However, there is an emerging opportunity. New market structures, fuel sources, and technologies, if supported by appropriate commercial arrangements and political willingness, could strengthen long-term sustainability of the energy sector for all.

11. Enabling private sector participation in the energy sector has a central role in achieving diversification and requires extensive technical planning and coordination. Domestic electricity generation in WB&G can come from renewable energy and natural gas. As discussed earlier, recent increase in cost-effective gas supply creates an attractive opportunity for the existing IPP in Gaza and two proposed IPPs in the West Bank. However, as these IPPs are large-scale investments, they face multiple barriers related to sector creditworthiness, expensive gas infrastructure, and evacuation of the power produced. Once solutions for these issues are identified, there would be the need for appropriate financial structures and payment security measures. On a smaller scale, solar PV systems have attracted a high level of interest from the private sector, both as dedicated supply for household, public facilities (health, education, water and wastewater), commercial, and industrial customers and as utility-scale systems. The current installed capacity is estimated to be nearly 10 MW in Gaza and 50 MW in the West Bank, with an additional 30 MW and 100 MW, respectively, in the pipeline. A majority of these projects are below 5 MW and being developed by local companies on own lands. The utility-scale projects are direct proposals and the International Finance Corporation (IFC) is currently advising PENRA in its first competitive process. With improved technical coordination, the Israeli and Palestinian grids could capitalize on the abundant renewable energy resource.

12. Lack of participation of women in the energy sector in WB&G continues to remain a challenge for the PA. Improving energy security, particularly in Gaza and for female-headed households and women-owned businesses, could contribute to narrowing the gender gaps between females and males in accessing more and better income-generating opportunities and in health and education outcomes. For example, global studies have shown that enhanced energy security can increase productive time for work and study, contributing to improved educational outcomes, access to higher-earning jobs, and increased entrepreneurial opportunities for women. Improving employment opportunities for women in the energy sector is important, as female students form a large proportion of engineering graduates in WB&G and find it challenging to find jobs. These job opportunities could be in energy sector entities, in private sector companies and through self-employment, including as renewable energy related entrepreneurs.

13. PENRA's strategic long-term vision to achieve greater autonomy through financial and operational sustainability and diversification of power supply is achievable. This vision is being implemented through a sustained reform process led by PENRA and supported by the donor community, to transform the energy sector into a structured, regulated, and efficient service. Improved and cost-



effective service is important for all productive sectors and for maintaining the quality of life for consumers. Electricity sector can also attract significant investment in WB&G. Overall, the benefits of a sustainable electricity sector are essential to reduce the burden on government revenues, enhance performance of the economy, and ensure improved competitiveness and fiscal sustainability of the Palestinian economy.

C. Relevance to Higher-Level Objectives

14. **The Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector (ASPIRE) multiphase programmatic approach (MPA) aims to realize the World Bank Group twin goals of reducing extreme poverty and boosting shared prosperity by improving energy services for the people of WB&G.** By increasing access to electricity for vulnerable populations, ASPIRE aims to improve livelihoods and contributes to reducing poverty. By supporting the PA to diversify energy sources, the MPA will help reduce supply shortages—a major debilitating factor for those unable to afford a diesel generator. Supporting small and medium enterprises (SMEs) to gain access to improved electricity will have a threefold effect of (a) increasing their productivity and revenues, (b) increasing their ability to compete in the market; and (c) helping them grow their businesses, which will in turn create jobs and reduce unemployment.

15. **This is aligned with the World Bank Group’s FY18–21 Assistance Strategy (AS) for WB&G through the Maximizing Finance for Development (MFD) approach.** The MPA supports the first AS outcome on ‘private sector investments and jobs increased as a result of upstream reform’ by improving operational and financial performance of energy sector institutions and by improving infrastructure, which will help generate revenues of the DISCOs and enhance creditworthiness in the sector. This, together with the Liquidity Support Account and Payment System, will encourage private sector investments across the sector, particularly toward integrated investments in solar PV solutions. Thus, the MPA contributes to the second AS outcome ‘financing mobilized for specific investments and transactions structured’. The MPA also supports the third AS outcome ‘vulnerable protected and strengthened citizen-centered institutions built’ by enhancing the ability of the sector to engage citizens and improve service delivery.

16. **The ASPIRE MPA is fully aligned with the March 2019 enlarged Middle East and North Africa (MENA) Regional Strategy and the 2016–2020 World Bank Group Climate Change Action Plan by enabling WB&G to adapt to climate change and supporting the sector in moving toward renewable energy.** The MPA supports the regional strategy pillar of recovery and reconstruction and will ultimately contribute to ‘inclusive growth and jobs’ by investing in required infrastructure that will promote regional trade in the energy sector between the West Bank and Jordan and Egypt. It will also support the enlarged MENA Strategy’s focus area of Maximizing Finance for Development.

17. **WB&G currently is and, in the future will be, exposed to natural hazards such as drought, extreme heat, water scarcity, and extreme precipitation.** Mean annual temperature in the target project locations is projected to increase by approximately 2°C by 2050 with a similar projected rate of warming for all seasons. Flash flooding and severe and recurring droughts have devastating impacts on the country’s economy, agricultural productivity, food security, and vulnerability of rural populations. Improving resilience of energy services, through renewable-based supply, is important for continued



operation of critical infrastructure, including water, wastewater, health, and other systems, and to provide mitigation and adaptation service to the people of WB&G.

18. **ASPIRE contributes directly to the second and third pillars of the World Bank's Gender Strategy (FY16–23) by removing constraints for more and better jobs and removing barriers to women's ownership and control of assets.** By paying attention to Palestinian women entrepreneurs working in innovative energy fields, such as the renewables sector, this project aims to remove structural constraints facing women in their access to productive jobs, assets and finance while also indirectly improving health outcomes through access to clean and reliable energy sources. The MPA is especially useful as it allows a longer engagement to iteratively address the more complex and multifaceted challenges facing women-headed households and women-owned businesses.

D. Multiphase Programmatic Approach

(i) Rationale for Using MPA

19. ASPIRE is designed on the analytical foundation provided by the Securing Energy for Development Report,¹⁰ which elaborated the PENRA Vision 2030. This vision supports the goals of PENRA's Electricity Sector Strategy (2017–23) and National Renewable Energy Policy (2017–22); see table 1. Achieving this vision requires sustained financing to undertake longer-term planning, concerted policy reform measures, and infrastructure interventions. This is the overarching rationale for the ASPIRE MPA.

Table 1. PENRA Strategy and Vision

PENRA's National Energy Strategy (2017–23)	PENRA Vision 2030
<ul style="list-style-type: none">• Increasing domestic generation using local resources• Increasing proportion of energy produced from renewable sources in the total energy mix to reduce negative environmental impacts• Producing and consuming energy with high efficiency through reasoning the consumption and reducing losses in production and consumption• Achieving energy security through diversification of sources, including regional connectivity and energy exchange with neighboring countries	<p>Limiting dependence on any one source of energy to no more than 50 percent through</p> <ul style="list-style-type: none">• Expansion of solar energy in areas A and B;• Development of gas-fired power generation capacity; and• Achievement of a relatively balanced composition of imports and domestic solar and gas-fired power generation.

20. The specific benefits of the MPA are outlined below:

- **Provides a risk mitigation-based approach to implementation as it enables adaptive management, provides flexibility, and builds institutional capacity to address unforeseen challenges.** The overall political context in WB&G is fragile, conflict affected, and uncertain. The MPA can help the electricity sector navigate toward its vision through this complex context. The phased approach provides an opportunity for future phases to learn from the

¹⁰ The Securing Energy for Development full report can be accessed at <http://documents.worldbank.org/curated/en/351061505722970487/pdf/Replacement-MNA-SecuringEnergyWestBankGaza-web.pdf>.



positive and negative lessons of earlier and ongoing phases. The approach also allows the flexibility for course correction as new challenges and opportunities emerge, while ensuring progress toward the program outcome as laid out in the Theory of Change (ToC) (figure 2).

- **Creates the framework for moving toward a longer-term planning process while managing the year-by-year financing cycle and need for active fundraising.** The fragile and uncertain political environment in WB&G manifests itself in the current short-term and piecemeal approach to financing. Electricity sector's financial flows are closely tied to the PA budget due to the net-lending mechanism described earlier. IBRD financing is allocated on an annual basis. International financial aid is also typically annually allocated, closely tied to respective donor country priorities, emerging humanitarian priorities, geo-political considerations, and evidence of a robust and justified financing pipeline. However, multiyear programming is vital for undertaking complex reform process that is essential to improve sustainability of the sector; to plan and build larger infrastructure, and; to engage the private sector. This MPA directly addresses the need to define longer-term actions and financing needs, with clearly defined outcomes, Results Framework, and a robust pipeline.
- **Creates a platform for enhancing technical coordination between Palestinian electricity sector, IEC, and relevant authorities.** The Palestinian and Israeli electricity systems are deeply intertwined. Stronger technical coordination will enable the electricity companies to ensure that power quality and availability of supply through imports or solar PV systems is well managed, thus enhancing reliability of supply for all customers.
- **Provides a crucial signal to the private sector of the PA's commitment and the intentions of the World Bank and Development Partners to support the PA's efforts.** Diversification of supply is one of the focus areas under this MPA, which includes motivating the private sector to consider investing in WB&G. Attracting and realizing private sector participation begins with building confidence in the PA's intention to become and remain a reliable long-term counterpart. The confidence measures—including a robust reform program, clearly defined plans to build the supporting infrastructure, and clarity of financial flows in the sector—cannot be achieved in the short term. Furthermore, given the fragile context, investors are less likely to accept policy commitments on paper without ongoing engagement of the development community to ensure effective implementation of the same. This is an essential prerequisite toward achieving the MFD objectives of the World Bank and attract more investment into the energy sector.
- **Allows the current political and financial constraints to be better managed through improved dialogue and a longer-term structured pathway, with well-defined development outcomes.** A structured approach strengthens the development outcomes by structuring individual activities toward a strategic vision. This not only ensures a more robust Results Framework but also that each phase effectively builds on lessons learned in other phases. This structured approach to results reporting and defining pipeline also addresses donor requests for advance information of future financing needs with clearly defined outcomes. This MPA would create a positive reinforcement to motivate continued efforts by the electricity sector institutions.

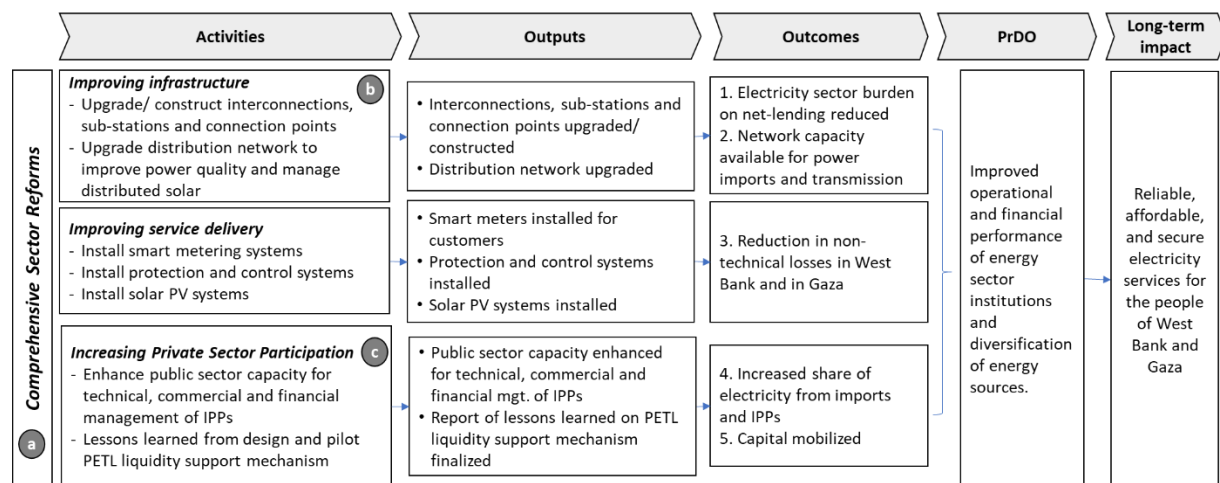


- **Creates a structured approach for assessing and managing environmental and social (E&S) impacts by facilitating effective application of the World Bank's Environmental and Social Framework (ESF).** The ESF is a relatively new framework, with stronger emphasis on stakeholder engagement and labor management. This, along with the more comprehensive grievance redressal for stakeholders, beneficiaries, affected parties and contractors, can be more efficiently implemented with a programmatic approach. The MPA allows for uniform application of ESF guidelines and gradual improvement through learning-by-doing, allowing institutional capacity to be created and enhanced across the sector.

(ii) Program Results Chain

21. The ASPIRE Program's implementation period spans eight years and envisages four phases. The Program Development Objective (PrDO) will be maintained throughout all phases of the ASPIRE Program. ASPIRE's ToC, presented in figure 2, aims to improve operational and financial performance of energy sector institutions by investments in infrastructure and improving overall service delivery, which in turn contributes to improving the sector creditworthiness that is essential to increase private sector investments. The ToC considers the country's fragile and unique context, highlighting some of the key critical assumptions made for achieving the PrDO.

Figure 2. Theory of Change



Critical Assumptions:

- Accelerated pace of implementation of sector reforms
- Construction approvals/permits received in timely manner
- Continued high-level government support for engaging private sector

(iii) MPA Program Development Objective

22. Improve operational and financial performance of energy sector institutions and diversification of energy sources.



(iv) Key Program DO indicators

23. The ASPIRE Program will progressively monitor, measure, and target the following MPA Program Development Objective (PrDO) indicators throughout all program phases, while targets may be adjusted after each phase depending on lessons learned and progress made.

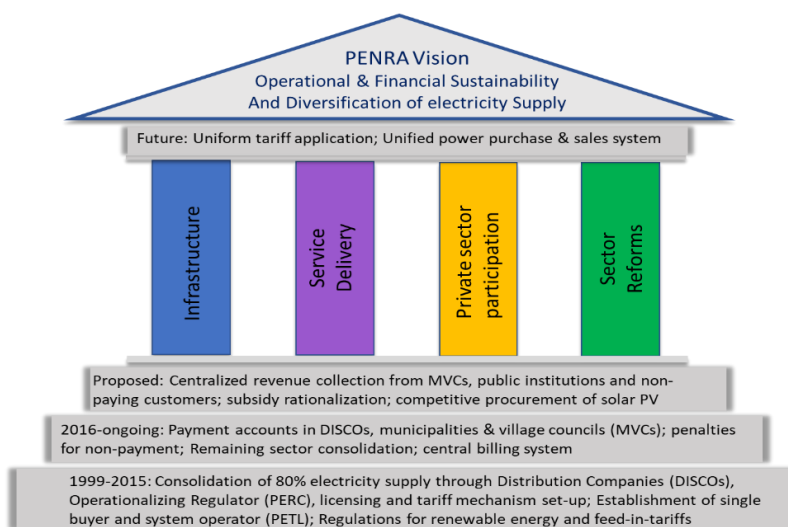
Table 2. Program Development Objective (PrDO) Indicators

PrDO	PrDO Indicators
Improve operational and financial performance of energy sector institutions and diversification of energy sources	<ul style="list-style-type: none"> • Non-technical losses in the West Bank • Non-technical losses in Gaza • Electricity sector deductions from clearance revenue mechanism 'net-lending' in West Bank • Electricity supply from imports • New supply from IPPs

(v) Program Framework

24. The Program Framework for ASPIRE transforms the road map¹¹ recommended by the Securing Energy for Development report into four pillars, which serve as the basis for defining activities to be included in future phases. Activities are further classified based on the lead time required for planning and preparation. Complex activities such as engaging IPPs and constructing large infrastructure require a significant longer planning period to achieve financial and operational readiness. The ToC described in figure 2 is operationalized through the four pillars described in figure 3. The pillars are implemented across the proposed four phases. The components will be designed as described in Pillars 1–3 and will be phased in response to strategic priorities, absorptive capacity, and implementation progress. The ASPIRE MPA will also identify sector reform recommendations under Pillar 4 through technical assistance and enable policy dialogue, which could potentially be supported through future development policy grants. The learning agenda section describes the approach to designing subsequent phases.

Figure 3. Program Framework - MPA Pillars



¹¹ Annex 4.

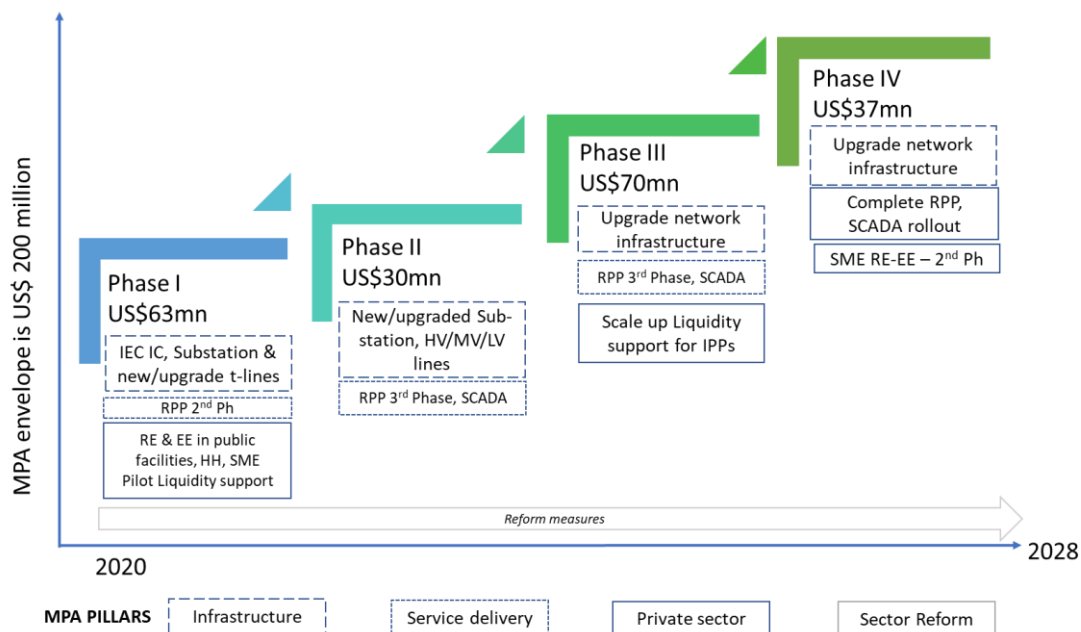


25. Pillar 1 focuses on the transmission, distribution, and interconnection infrastructure necessary to import electricity from neighboring countries and improve quality and reliability of power supply across WB&G. Pillar 2 focuses on the management of distribution systems for reliability and quality and on demand-side activities to improve revenues and increase efficiency. Pillar 3 seeks to create an enabling environment for the private sector to contribute to the goal of cost-effective, diversification of electricity supply in WB&G through adoption of solar PV technology for own use and as IPPs. Pillar 4 builds on the continuing implementation of reform measures by PENRA and the PA to improve the electricity sector's performance. Further details are provided in annex 2.

(vi) Simultaneous MPA with Overlapping Phases

26. This MPA is structured with simultaneous and overlapping phases, that is, approval of subsequent phases will be contingent on satisfactory implementation performance of preceding phases and the client meeting all legal obligations. The simultaneous MPA provides the ability for the phases to adapt to changing circumstances, prioritize actions under the different pillars, and ensure seamless continuation of the required activities. This is an important flexibility as MPA funding is dependent on the availability of World Bank special finance and donor financing, which is only allocated on an annual basis. The MPA provides a framework for active fundraising and engages donor partners by providing ongoing reform and investment efforts as a robust rationale for funds allocation. The phased funding needs are estimates and the actual will depend on both prioritized funding requirements and grants allocated for the year.

Figure 4. Proposed Simultaneous (overlapping) Phases



27. **This MPA establishes the framework for development partners and the World Bank to explore options for providing multiyear funding allocation.** Table 3 provides an estimate of the future phases. 'Other Amount' includes funding from two sources namely, from World Bank's Trust Fund for Gaza and West Bank (TFGWB) and from development partners through the Partnership for Infrastructure



Development-Multi-Donor Trust Fund (PID-MDTF). The funding estimate for future phases is based on current discussion. The funding for Phase 1 is being provided by TFGWB (US\$14 million) and PID-MDTF (US\$49 million). Partial funding has been secured for Phases 2 and 3. As most donors typically follow an annual fund replenishment cycle, the ASPIRE funding estimates will be shared to secure multiyear funding commitment. Success in the initial phases of ASPIRE is expected to strengthen World Bank and donor confidence and attract more funding, which can serve as an incentive and motivating factor for the Palestinian electricity sector institutions.

Table 3. ASPIRE Phased Financing

Phase #	Sequential or Simultaneous	Phase's Proposed Development Objective	IPF or PforR	Estimated IBRD Amount (US\$, millions)	Estimated IDA Amount (US\$, millions)	Other Amount (US\$, millions)	Estimated Approval Date	E&S Risk Rating
1	Simultaneous	Improve operational and financial performance of energy sector institutions and diversification of energy sources	IPF	0	0	63	Apr 2020	Substantial
2	—		IPF	0	0	30	June 2021	Substantial
3	—		IPF	0	0	70	Mar 2023	Substantial
4	—		IPF	0	0	37	Mar 2025	Substantial
Total				0	0	200		
Estimate for the entire MPA Program				US\$200				

Note: IPF = Investment Project Financing; PforR = Program-for-Results.

(vii) Learning Agenda

28. **The ASPIRE MPA provides a unique opportunity for a continuous learning agenda, including learning-by-doing and leveraging complementary technical assistance provided by other development partners, for the Palestinian sector institutions and private sector partners.** The learning agenda for this MPA has three broad objectives: (a) continuous improvement in implementation quality, (b) building of institutional capacity and readiness for robust power sector planning including design of future phases, and (c) structured approach to enhance design of the future phases. The success of the learning agenda can be assessed in quantitative terms based on the pace of program implementation and development of pipeline of priority activities for future phases and in qualitative terms through improved and informed design of future phases and continuous learning. The ongoing energy operations namely, Gaza Electricity Network Rehabilitation Project (GENRP, P116199) and Electricity Sector Performance Improvement Project (ESPIP, P148600) have strong technical assistance components and pilot activities that inform this MPA. The learning agenda is also supported through the Energy Sector Programmatic Technical Assistance (P162545). Lessons learned from the ongoing projects, which are informing Phase 1, are described in section II.E.

29. **Infrastructure improvement, under Pillar 1, is an ongoing process that T&D companies need to plan and implement.** As most of the Palestinian electricity sector institutions are relatively nascent, there is limited knowledge and experience of undertaking strategic planning and implementation. The first phase of ASPIRE undertakes urgent T&D upgrades and construction to address immediate needs to reduce power shortages and improve utilization of solar resources. As the sector has extensive operational



capacity needs, the first phase will facilitate the creation of a community of practitioners (CoP) among the sector institutions (PENRA, PETL, DISCO, and PERC) to enable (a) alignment of PETL's transmission master plan, DISCO's distribution master plans, and demand projections from LGUs; (b) development and harmonization of the transmission code, distribution grid code including for utility-scale solar, and interconnection standards for imports; (c) strategic prioritization of T&D investment needs for financing through tariffs, PA budget, and donor support; and (d) a cohesive approach to technical coordination with IEC. This community will create long-term capacity and coordination within the sector institutions that will also inform future phases.

30. Service delivery, under Pillar 2, is the keystone of the electricity sector as it focuses on customer management and responsiveness. Under ESPIP, DISCOs have started implementing a harmonized revenue protection program (RPP) that targets the largest customers. ASPIRE Phase 1 will begin the process of enhancing metering, billing, and collection for a broader group of customers, which includes the next tier of largest customers and potentially public sector consumers. This will involve installation of smart meters. More importantly, Phase 1 will seek to identify citizen engagement, communication, and other approaches to improve the ability of DISCOs to install the meters, to ensure timely payments, to reduce nonpayment, and to improve monitoring of financial flows for each DISCO and the entire sector.

31. Private sector engagement, under Pillar 3, is a longer-term goal that requires longer-term planning, sustained effort, and innovative solutions. Building on lessons learned from ESPIP and demand estimation of Phase 1 will expand the pilot Gaza rooftop solar PV financing mechanism to the West Bank. In addition to the existing financing mechanism, Phase 1 will test multiple approaches including community solar, renting roofs, and competitive solar IPPs for dedicated supply to public facilities, poor households, and refugee camps. ASPIRE will also enable PENRA to build on assessments being conducted by other development partners, particularly World Health Organization (WHO) and United Nations Development Programme's (UNDP) in-depth assessment of the electricity needs in the water, sanitation, health, education and agriculture sectors and solar site assessments by IFC, Kreditanstalt für Wiederaufbau (KfW), and Office of the Quartet (OQ). Phase 1 also involves the design and piloting of the PETL Liquidity Support Account to attract private investors and developers using MFD approach. This activity will build on the ongoing IFC advisory project to support PENRA in implementing a competitive procurement process for inviting private developers as IPPs and will help build the capacity of PENRA and PETL to institutionalize the process. Pilot implementation will inform future phases.

32. Comprehensive sector reform, under Pillar 4, is supported by technical assistance and capacity building. The requirement for specific sector reforms will be identified through the lessons learned during the implementation of Phase 1 activities. This includes identifying decrees, policies, cabinet decisions, and other directives needed to implement grid codes, enhance revenue collection, improve wholesale and retail tariff-setting, and support solar PV installations. During Phase 1, a high-level committee will undertake the design of the PETL Liquidity Support Account and mechanism. This process will identify a specific action plan for piloting of this mechanism and for its scale-up in subsequent phases.

33. The following is the summary of the activities expected in subsequent phases to achieve the PrDO. The scope and timing of the future phases will depend on the availability of funding and continuous learning. The number of phases could be increased or reduced, as required, based on funding availability and emerging priorities.



- **Phase 2.** This phase is expected to continue to scale up specific activities from Phase 1, including support construction of specific substations and upgrade of priority distribution lines (low voltage/medium voltage) and implementation of the supervisory control and data acquisition (SCADA) system to improve quality of supply, load management, and integration of renewable energy.
- **Phase 3.** This phase will focus on scaling up the Liquidity Support Account and mechanism, depending on the experience and results from the design and pilot in Phase 1. This will be accompanied by specific transmission infrastructure investment necessary to enable the small and large IPPs to serve the load centers and by continuing RPP and SCADA system expansion.
- **Phase 4.** This will build on Phase 1–2 activities to strengthen the T&D infrastructure to ensure grid availability and stability to efficiently manage up to 600 MW of new sources (a majority will meet suppressed and growing demand) of electricity from natural gas, renewable energy, and imports in WB&G. This may also be the completion phase and will be used to define future energy engagement.

II. PROJECT DESCRIPTION

A. Project Development Objective

PDO Statement

34. The Project Development Objective (PDO) of Phase 1 ('Project') is to improve operational and financial performance of electricity sector institutions and diversification of energy sources in the West Bank and Gaza.

PDO Level Indicators

35. The Phase 1 PDO indicators are a subset of the PrDO indicators presented earlier.

Table 4. PDO Indicators

Program Development Objective (PrDO): ASPIRE MPA Program			
To improve operational and financial performance of electricity sector institutions and diversification of energy sources			
Project Development Objective (PDO): ASPIRE Phase 1			
To improve operational and financial performance of electricity sector institutions and diversification of energy sources			
PrDO/PDO Indicators	Unit of measure	Baseline	End Target
Non-technical losses in the West Bank	Percent	11 (Sept 2019)	9 (Dec 2024) (Phase1) 6 (Dec 2028) (Program)
Non-technical losses in Gaza	Percent	20 (Sept 2019)	18 (Dec 2024) (Phase1) 15 (Dec 2028) (Program)
Electricity sector deductions from clearance revenue mechanism 'net-lending' in West Bank	Percent	30 (Sept 2019)	25 (Dec 2024) (Phase1) 15 (Dec 2028) (Program)
Electricity supply from imports	MW	36 (Sept 2019)	80 (Dec 2024) (Phase1)



(Phase 1: Electricity imports from Jordan)			80 (Dec 2028) (Program)
New supply from IPPs	MW	0 (Sept 2019)	20 (Dec 2024) (Phase1) 100 (Dec 2028) (Program)

B. Project Components

36. PENRA is responsible for implementing the entire program and will coordinate with the respective sector institution, as noted in the following paragraphs. The selection of activities for inclusion in Phase 1 is based on three factors, which will also be used as the basis for prioritization in the future phases: (a) scaling-up of activities initiated under the ongoing projects, (b) urgent activities to reduce load shedding and power quality issues by enabling transfer of electricity from IEC and Jordan or evacuation of existing/upcoming solar PV systems, and (c) foundational activities related to financial discipline that are crucial to build sector creditworthiness. Detailed description is provided in annex 2.

Component 1: Improving Infrastructure for Regional Electricity Interconnections in the West Bank and Gaza (US\$13 million)

This component contributes to the PrDO and PDO by enhancing operational performance and increasing diversification of supply from imports. The activities under this component will be led by PENRA, PETL, and relevant DISCOs and will focus on strengthening infrastructure for medium- and high-voltage interconnection and evacuation of solar PV systems. This includes, (a) the rehabilitation and transfer of IEC inter-connection points in West Bank & Gaza and (b) The upgrading of existing infrastructures or new infrastructure in Ramallah, Jericho, Jenin, Nablus, Hebron and Gaza areas to increase power supply from IEC and utilization within the DISCOs, including: (i) installation of voltage regulation on the network or connection points; (ii) replacement of medium voltage lines with higher sized powerlines of increased capacity; (iii) replacement of power transformers having higher capacities; (iv) construction of medium voltage lines or replacement of overhead lines with underground cables; (v) evacuation of imported energy from Jordan and Jericho to Ramallah and; (vi) rehabilitation of selected sub-stations. This would enable increase in electricity supply from Jordan and Israel. In addition, this would enable PETL and PENRA to initiate a longer-term discussion on improving electricity supply in Gaza.

Component 2: Improving Sustainability of Service Delivery in West Bank and Gaza DISCOs (US\$7 million)

This component contributes to the PrDO and PDO by enhancing financial performance through the scale-up of the ongoing the RPP, started under ESPIP, for improved metering and billing systems in WB&G. The activities under this component will be led by PENRA and the respective DISCOs in WB&G. This component focuses on provision of support for the sustainable improvement of operational performance of DISCOs, as part of the Revenue Protection Program (RPP), which includes provision of smart meters to improve billing and collection for the high-value segment of consumers, as well as identifying solutions to (a) address poorer communities, which form the bottom 30 percent of consumption with wide-spread non-payment, and (b) improve payments and encourage conservation among public sector customers. This component aims toward sustained improvement of operational performance of DISCOs. The RPP includes smart meters to improve billing and collection for the high-value segment of consumers, which represent the largest electricity consumption and sales. Under ESPIP, RPP



stage 1 is covering the top 15,000 customers responsible for 23 percent of the total electricity consumption across the six DISCOs. Under ASPIRE Phase 1, RPP stage 2 will be implemented that will expand the target to 30 percent of largest consumption. This may include a focus on public sector customers. This phase will also identify solutions to (a) address poorer communities, which form the bottom 30 percent of consumption with widespread nonpayment, (b) reduce non-technical losses (theft and undocumented customers), and (c) improve payments and encourage energy conservation among public sector customers, which are expected to be implemented in future phases.

Component 3: Enabling Private Sector Engagement in Renewable Energy (US\$34 million)

This component contributes to the PrDO and PDO by diversifying energy sources through distributed solar in WB&G. The component focuses on provision of support to enable the diversification of electricity supply in West Bank and Gaza, through: (a) Increase the ability of the grid to manage rooftop and small-scale solar PV systems. (b) (i) scaling-up the existing Solar Rooftop PV Financing Mechanism for rooftop solar PV systems for households and SMEs; and (ii) support the installation of solar solutions and energy efficiency measures (e.g., heating, cooling and lighting) in select health and education facilities. (c) strengthening the electricity sector and PETL creditworthiness to attract private sector as independent power producers, through the design and piloting of a Liquidity Support Account and Payment System. This component will also contribute to reducing the identified gender gaps.¹² The activities under this component will be led by PENRA, in coordination with DISCOs, relevant line ministries, and local commercial banks. The activities related to public facilities, specifically health and education, will be implemented in coordination with the relevant ministry and those related to the Liquidity Support Account and Payment System in partnership with the Ministry of Finance (MOF) and the high-level sector reform committee.

37. **PENRA, PETL, and DISCOs are preparing prioritization criteria to identify portions of the distribution network that require upgrading to enable successful transfer of electricity to load centers and installation of protection equipment to minimize impact on IEC network.** As the estimated needs are beyond the financing available, top priorities will be covered in Phase 1 with activities identified for future phases. PENRA, with support of the international community and the private sector, has been actively promoting small- and medium-scale solar. Most of them are on a net-metering basis in area A and range between 5 KWp and 5 MWp, with only a few IPPs in operation. DISCOs are beginning to face technical constraints in managing this intermittent supply. This is a critical issue as non-availability of grid would create stranded assets and if the projects are IPPs, create additional financial loss for the utilities and concern within the private sector. Grid upgrade requirement also applies to the blooming interest in rooftop solar PV system, using net-metering, resulting in grid saturation in some urban areas and causing potential stability concerns.

38. **Phase 1 supports scale-up of the financing mechanism for rooftop PV systems for micro, small, and medium enterprises (MSMEs) and households in Gaza and solar for health sector initiative in Gaza and its expansion to the West Bank. This mechanism was established under ESPIP and launched in**

¹² More details on the gender analysis and actions are in table 2.1.



October 2018. PENRA established a financing mechanism, under ESPIP¹³ in Gaza, supporting households to acquire solar PV systems from 2.5 KWp to 3 KWp and MSMEs to purchase solar PV systems with capacities of 5 KWp, 7 KWp, and 10 KWp. The selected beneficiaries pay back the system cost with zero interest for the total price, net of a down payment towards the system cost (2.5% by households and 7.5% by SMEs), over 2-6 years. The initial lessons learned from ESPIP are being incorporated through a greater emphasis on MSMEs, particularly female-owned small businesses. As the current mechanism is limited to salaried households, new windows will be established to expand the reach of the solar energy solutions to poor and vulnerable households in coordination with the Ministry of Social Affairs. The grant-based solar for health initiative will expand to include other sectors, particularly education and agriculture, and cover wider range of solar solutions, including PV and solar thermal and energy efficiency measures.

39. Unlocking private sector participation in new IPPs requires strengthening of PETL's creditworthiness, which can be enabled through the proposed PETL Liquidity Support Account. To meet energy demand in WB&G, it is necessary to diversify and increase competitively priced sources of supply. This is specifically focused on inviting private sector as IPPs through a competitive procurement process. New IPPs, to be viable, need a reliable and creditworthy buyer who can purchase the power produced on time. As is typical in project finance, power is purchased under a PPA, which includes mechanisms to mitigate the risk of nonpayment, often using letters of credit (L/Cs). The PETL Liquidity Support Account will provide the cash collateral needed for PETL to obtain L/Cs that backstop its payment obligations under PPAs with new IPPs. The account will support a multilevel defense against nonpayment risk: the first level is payment of invoices by PETL; the second level, upon nonpayment, draws upon the L/Cs for previously agreed amounts; the third level is repayment by the MOF to the L/C bank for amounts drawn under the L/Cs; and lastly, if there is nonpayment by the MOF, the L/C bank can seek reimbursement from cash collateral in the Liquidity Support Account. Successful payment record of PETL will establish its creditworthiness, allowing it to engage with larger-scale IPPs in the future.

40. The Liquidity Support Account design process draws upon and expands the current MOF, PENRA, and PETL institutional initiatives for improved power sector governance, transparency, and operation. The MOF will play a central role in the design of this mechanism. Establishment of the support account is planned as a two-step process. Step 1 will be designing the processes and procedures for a sector-wide payment system, including the support account, that mitigates the risk of PETL's nonpayment and signals PETL's ability to support PPAs with new IPPs. The support account will be governed by principles of transparency and oversight as per project finance best practice and satisfactory to the World Bank. The design process will be led by a committee comprising of the MOF, PENRA, and PETL with support from subject-matter experts. Step 1 will conclude with the preparation of the 'Liquidity Support Account and Payment System Operations Manual', which will include detailed governance and institutional structure, financial and legal arrangements, plus terms and conditions of operation. This manual will cover a sector-wide payment system that has three primary components: the expanded PETL Unified Account, including a prioritized cash flow waterfall; the Electricity Bills Settlement Mechanism; and the PETL Liquidity Support Account. The manual will include a detailed process for competitive and transparent procurement of IPPs and will be reviewed and approved by the World Bank team as the disbursement condition. Step 2 involves pilot launch of the liquidity support account, with disbursement of funds into

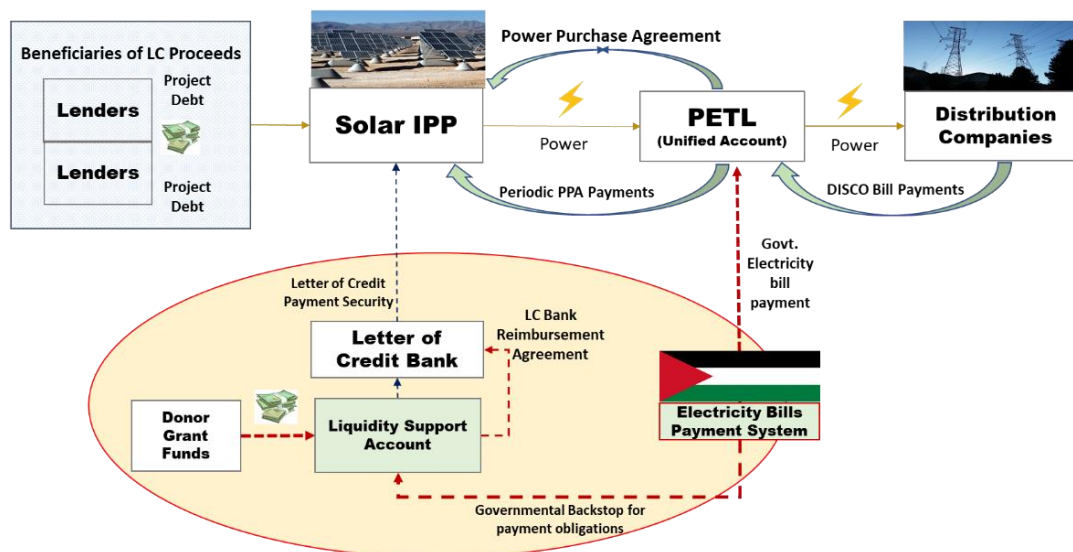
¹³ <http://documents.worldbank.org/curated/en/297361501380046131/West-Bank-and-Gaza-Electricity-Sector-Performance-Improvement-Project>.



the account and the issuance of L/Cs. Step 2 is expected to launch within one year of effectiveness. As agreed with the donor partners, if for any reason this mechanism is not launched or the account is not created, the funds will be utilized to support solar solutions in Gaza.

41. The Liquidity Support Account will work together with the PETL Unified Account and MOF Electricity Bills Settlement Mechanism to (a) strengthen PETL's ability to attract private sector investment on commercially competitive terms, while building its creditworthiness, (b) enable stronger coordination between the MOF, PENRA and PETL, and (c) in the longer-term, contribute to reduction in electricity sector-related deductions from the clearance revenue mechanism. Full-scale operation of the support account and payment initiatives by PETL contributes to the broader sector agenda of improved affordability and reduced financial burden: directly through cheaper energy sources and, indirectly through avoidance of contingent liabilities from sovereign guarantees.

Figure 5. Illustrative PETL Liquidity Support Mechanism



42. The pilot stage of the Liquidity Support Account could facilitate approximately 100 MWp solar IPPs, with the intention of being equally divided in the West Bank and Gaza. Given current perceptions of sector creditworthiness, the initial collateral requirement is expected to be 100 percent. With establishment of a good performance record, defined as non-utilization of the L/Cs due to timely payments by PETL, the collateral's leverage should increase with an aim to reduce the collateral requirement to 20 percent in the long term. Additional power supplies would help alleviate current shortfalls in energy supply, which are particularly affecting critical public infrastructure (for example, water and health) and, limiting private sector growth. Depending on further analysis during the design phase, this additional supply could also be entirely dedicated to critical public facilities and vulnerable populations, thereby reducing the cost of electricity borne by the PA.

Component 4: Technical Assistance, Capacity Building and Project Management (US\$9 million)



43. The activities under this component will be led by the Project Management Unit (PMU) in PENRA, which will coordinate with the energy sector institutions including PETL, DISCOs, PERC; the MOF; and other government and private sector institutions. This component focuses on strengthening the capacity of PENRA and its PMU, to ensure coordination with PETL, PERC, PA (including its Ministry of Finance), DISCOs and other private institutions, as well as provision of technical assistance for Project-related activities (including technical assistance for the design of the Liquidity Support Account, and preparation of feasibility studies), and supporting staffing of the PMU for Project implementation, including Training and workshops, monitoring and evaluation, and the provision of Operating Costs.

44. **Training and capacity building.** PENRA will organize workshops, support feasibility studies, engage experts, and ensure adequate dialogue and knowledge sharing within the sector and in coordination with other line ministries. The specific areas of support will comprise, but not be limited to, interconnection of solar PV installations, including utility-scale and small-scale solar with the grid or distribution network of utilities, and metering of solar PV and renewable energy installations. A dedicated training program will be developed during the design of the PETL Liquidity Support Account and Payment System to enable (a) improved understanding of the considerations of private sector investors, when evaluating creditworthiness and bankability; (b) improved capacity building for staff involved in negotiations of PPAs and dispute settlement mechanisms; (c) capacity building in account management and maintenance, billing and account settlement, cash flow management; and (d) improved strategic decision making and procurement of privately sourced power.

45. **Technical assistance.** Improved battery waste management and recycling in Gaza is a critical priority. The Gaza strip is estimated to have half a million batteries of various types (primarily lead acid and gel) in circulation. Given the excellent solar potential, the solar PV market is active in Gaza and continues to grow. As the Israeli border controls forbid the transport of batteries from Gaza to any external location (within Israel and abroad), management of this battery waste is an urgent environment and public health concern. During 2012 to 2015, the Ministry of Health recorded 120 children, who live near used lead acid batteries recycling workshops, suffering from lead poisoning with $>45 \mu\text{g/dl}$ in their blood. This activity will assist in identifying potential solutions for small-scale battery recycling, identifying the relevant equipment for import, and potentially supporting two to three small factories (workshops) to prepare plans to upgrade and retool their operations. This component is targeted at not only averting the negative environmental impact of batteries, but it would also improve working conditions in the existing factories, incentivize them to adopt good business practices, and potentially create new job opportunities.

46. **Gender actions in ASPIRE focus on** improving electricity infrastructure and service delivery to enhance the populations' living conditions and welfare, especially the poorest population groups, including women. ASPIRE will also seek to expand access of the Gaza solar funding mechanism for solar PV systems to salaried female heads of households and also to the West Bank. Based on preliminary analysis, some of the most vulnerable households, particularly female-headed households¹⁴, may not even have a rooftop space and those who do may only be able to afford the system with a partial grant

¹⁴ PCBS November 2018. FHHs who represent 9.4 percent of households in Gaza are among the most vulnerable of all groups of population. With 63 percent of them over 55 years old and widowed (74 percent), FHHs have limited income-generating opportunities with 91 percent reported as unemployed and yet their household consumes the same amount of electricity or slightly more compared to male-headed households (per capita).



(40–70 percent). Phase 1 will seek specific solutions to target vulnerable FHHs who represent 8 percent of households in Gaza, including through a potential subsidized scheme based on eligibility criteria to be defined in the Project Operations Manual (Refer to Annex 2, Table 2.1). Furthermore, supporting female entrepreneurship not only contributes to economic growth but also to social and human capital development of the overall population.¹⁵ ASPIRE will ensure that the needs of beneficiary women-owned businesses' are captured through a needs assessment, and respond to them through the provision of financial tools and solar kit options. The assessment will be carried out by trained female engineers who can provide follow up operation and maintenance services, as well as be engaged in the communications aspect of the project.¹⁶ In addition, ASPIRE will generate new evidence on the distribution of female staff in the energy industry and assess opportunities for new skills in the renewable market.¹⁷

C. Project Beneficiaries

47. The beneficiaries of this project include direct institutional beneficiaries in the electricity sector: PENRA, PETL, PERC, DISCOs, and LGUs. The infrastructure components benefit the T&D systems, which include PETL and LGUs. The improved service delivery components are crucial to continue improvements in revenue collections, which will benefit the entire value chain. The small-scale solar PV systems, including rooftop solar systems, will enable households and SMEs—women-headed households and SMEs—to increase their access to electricity, and is expected to benefit around 5,000 people (of which 45% are female). The grant-based solar solutions and energy efficiency measures will enhance services in health, education and agriculture sectors. The Liquidity Support Account and Payment System is intended to improve the financial sustainability of the entire sector. This will support the efforts of the MOF and the PA in increasing private sector confidence in the energy sector.

D. Rationale for Bank Involvement and Role of Partners

48. The World Bank has a long-standing engagement in the electricity sector in WB&G. This MPA builds on this engagement to help PENRA make progress toward its longer-term goals and vision for the sector. The World Bank also has an extensive and robust dialogue with the donor partners, particularly through the PID-MDTF, which brings together 10 donor partners to support key sectors (water, urban, and energy). Over the past two years, two new donors have joined the PID-MDTF as a channel for their renewed funding to the energy sector and many of the existing and new donors have expressed interest in potentially scaling up their contribution if there is a robust pipeline and clear results chain. Donor coordination efforts include, the Energy Sector Working Group (for which the World Bank acts as technical advisor) and thematic groups focusing on Renewable energy, Gaza-specific issues and revenue protection. These groups meet regularly, both to share latest information and to ensure better harmonization of technical assistance and investment. This is emerging as an effective platform for ongoing dialogue and

¹⁵ Women's Entrepreneurship - How to Measure the Gap between New Female and Male Entrepreneurs? World Bank Policy Research Working Paper 8284, 2017.

¹⁶ Analysis will include a market assessment of MSMEs to understand needs for financial services and solar kits.

¹⁷ Candidates will be identified through various networks and platforms such as the Gaza Women and Energy Network (GWEN). During preparation, the project conducted a market survey of male- and female-led MSMEs to understand different needs for financial services and assess their needs/priorities in terms of technical specifications surrounding solar kits.



knowledge sharing. The World Bank also maintains an ongoing dialogue with the GoI, and many of the technical issues could be highlighted to the relevant authorities.

49. The World Bank team continues to hold discussions with key international financial institutions to identify opportunities for co-financing and parallel financing. This MPA also takes forward World Bank's broader efforts toward regional integration such as through the Jordan interconnection and toward private sector engagement in the power sector. The World Bank adds value as a financing partner, knowledge partner, and convener.

50. The World Bank has supported PENRA through the process of creating and strengthening several key sector institutions, including the DISCOs, PERC, and PETL, with technical assistance and investment projects. The MPA reflects the experience from the Electricity Utility Management Project (2008–16), the ongoing ESPIP and GENRP, and the Development Policy Grants series. World Bank involvement in ongoing reforms and participation in key sectors is often cited by private sector participants as a key factor in decision making when considering opportunities in emerging markets and developing sectors. Globally, World Bank involvement has been proven to minimize the risk of reform reversal and mitigate nonpayment risks for project-financed assets. World Bank's ongoing sector dialogue, as well as financial support for the PETL Liquidity Support Account and Payment System, addresses key private sector concerns while enhancing the likelihood of positive outcomes from sector reforms.

E. Lessons Learned and Progress on Learning Agenda

51. **Creating of opportunity for knowledge sharing within Palestinian institutions.** Energy sector institutions in WB&G range from the highly mature to new, which creates a unique opportunity for PENRA to facilitate greater knowledge exchanges. While they are vastly different in scale, they operate in similar contexts and have valuable knowledge, insights, experience, and resources to share. ESPIP's RPP and management information system activities has established a CoP with relevant technical staff from each DISCO. The implementation of this new program would benefit from establishment of CoPs for T&D planning, network management, revenue management, and monitoring and reporting. Such communities can enable targeted training on specialized topics and creation of centers of excellence on specific thematic areas and provide a simpler mechanism for donors to provide technical assistance.

52. **Ensure flexibility and simplicity in design and focus on the objective instead of activity.** Given the complex political and economic environment, it is important to ensure that the design of activities is simple with flexibility in implementation and monitoring and evaluation (M&E). This is one of the key lessons learned, based on current experience, from the pilot financing mechanism for rooftop solar PV systems for households and SMEs in Gaza. The original activity focused on salaried employees; however, recent developments with pay-cuts and job losses reduced the pool of eligible beneficiaries. Furthermore, the finding that several banks where people have their salary accounts are not recognized banks further reduced the pool of beneficiaries. Many eligible beneficiaries do not have sufficient available rooftop space due to competing priorities uses such as water storage tanks and due to shading from neighboring buildings. Based on this experience, the pilot financing mechanism in ESPIP is being modified and ASPIRE is expanding to include a range of solar solutions and energy efficiency measures. Implementation progress in WB&G is slower than usual as (a) beneficiaries (PENRA, PETL, and DISCOs) require long lead time to plan travel within the West Bank, which includes visiting PENRA in Ramallah and organizing site



visits, and (b) transportation of material within the West Bank and particularly into Gaza also requires extra time. In previous projects, customs clearance, transportation challenges, and Gaza border entry have delayed material entry by as much as six months to one year, causing severe implementation delays.

53. **Identification and design of the PETL Liquidity Support Account and Payment System, together with other Pillar 3 activities, reflect specific lessons learned from Nigeria, Sierra Leone, and Ghana, and others from World Bank guarantee operations.** It also reflects principles identified under the Sustainable Development Goals Agenda 2030 report, specifically goals 7 and 9, and the MFD program, particularly the importance of creditworthiness and transparency to attract the levels of private capital required to support emerging market infrastructure development.

54. **Need for harmonization of technical standards and processes.** As the total customer base across WB&G is relatively small, harmonizing standards and combining procurements is efficient and cost-effective. This has been undertaken for the RPP and management information system components in ESPIP and has provided unique opportunities for creation of a CoP; for joint procurement and; a common platform for technical standards. This needs to be continued for T&D network operations and equipment. Furthermore, as the distribution networks managed by DISCOs and LGUs and the transmission infrastructure managed by PETL need to coordinate with IEC's network, it is important to establish a transmission code and a distribution code for stronger technical coordination between PETL and IEC.

55. **Provision of vendor awareness and training.** Weak capacity and knowledge among local bidders, caused by lack of vendor response and poor quality of submissions, either due to lack of understanding of the requirements or due to inability to fulfill all the requirements have led to failed bids or inordinately long bid evaluation processes. The Project Procurement Strategy for Development (PPSD) addresses this issue in greater detail. However, a key lesson learned is the need to create more awareness among the vendors, to attract more participation and to improve quality of their submissions.

III. IMPLEMENTATION ARRANGEMENTS

A. Institutional and Implementation Arrangements

56. **Recipient and executing agency.** The PA, through the Palestinian Liberation Organization, is the recipient of the project, while PENRA is the executing agency. PENRA was established in 1995 and its mandate was consolidated with the approval of the 1997 'Letter of Sector Policy', which highlighted the key institutional reforms needed by the sector. During project preparation, attention was given to PENRA's technical and implementation capabilities. PENRA and the sector institutions have qualified personnel to (a) prepare and implement the generation, distribution, and transmission activities to be financed under the proposed project and (b) prepare, supervise, and ensure the quality control of all studies and activities to be carried out under the technical assistance component. The PMU will also bring on board subject matter experts to support the technical staff of PENRA and the sector institutions.

57. **Project management.** PENRA has a well-established PMU for all donor-funded projects, including the ongoing GENRP and ESPIP. The PMU core team comprises a Project Director, Procurement Officer(s), Accountant(s), Project Engineer(s), and Procurement Assistant(s). The PMU ensures coordination with PETL, PERC, and DISCOs on all equipment and technical assistance to be provided under the project. The



PMU staff salaries and operational expenditures (OPEX) will continue to be partially financed by the MPA. The sustainability plan, to reduce donor dependency and ensure project sustainability, will continue to be assessed. As the PMU's role is evolving from project to program management, an in-depth functional analysis and capacity needs assessment will be undertaken to identify opportunities to enhance its effectiveness and to revise the PMU organization structure. PENRA will also secure additional planning, procurement, and technical advisory support to strengthen PMU performance.

B. Results Monitoring and Evaluation Arrangements

58. The project will use the indicators and mechanisms defined in the Results Framework. Under the guidance of PENRA's Chairman, M&E responsibility lies with the PMU Director, who will be responsible for data collection on the indicators to be reported to the World Bank on a biannual basis or during the supervision missions. The World Bank will provide additional support to PENRA for monitoring the indicators on gender and citizen engagement. The PMU will also conduct, jointly with the World Bank, an annual brief learning review, a review during preparation of new phases, and an Implementation Completion and Results Report at MPA closure. A POM will be prepared for the entire program, which will further describe M&E responsibilities, data collection, and frequency requirements.

59. The outputs will be monitored at least twice a year during the World Bank's supervision missions based on the implementation schedule proposed by PENRA and agreed by the World Bank.

C. Sustainability

60. This MPA provides institutional capacity strengthening and financial and technical assistance toward improving overall sector sustainability. This section focuses on the sustainability of the activities in Phase 1, building toward the project and program outcomes. As institutional capacity is crucial to achieve the longer-term sustainability, the focus is on ensuring PENRA, PETL, PERC, and the DISCOs are strengthened to play their respective roles. In addition, as the MOF and other key line ministries are important players to ensure payment of government bills, they are included in the discussion on overall sector sustainability.

61. Component 1 requires PETL to continue to expand its monitoring of the interconnection points across the West Bank, which is crucial to improving the tracking of bills and payments. As IEC and PETL have not yet signed the long-term PPA, energization of Tarqumia substation would require at least the signing of an interim agreement (similar to the one signed for Jalameh substation in Jenin). The rest of the activities focus on building and strengthening transmission infrastructure to enable power supply either from imports or from existing solar IPPs to areas facing electricity shortage. These activities are operationally self-sustaining, provided the import quantities are available from Israel and Jordan and the solar plants are commissioned and operate as planned.

62. The sustainability of DISCOs benefiting from the proposed project (Component 2) depends on the continued commitment of the DISCOs' top management to reduce network losses and the support they receive from the PA and PENRA. PERC's tariff calculations assume continuous reduction in technical and non-technical losses, which creates both an incentive for West Bank DISCOs to focus on this area and a clear sector-wide results indicator. Since the 2016 debt settlement agreement, PENRA has been



extensively focusing its efforts on an inter-ministerial committee to assist DISCOs. The initial results since 2017 are encouraging; however, the challenges to increase collection rates above 90 percent are much higher and more complex, requiring higher-level political support. The focus is now being shifted to reducing non-technical losses as stronger, continued action is necessary to improve results in the future.

63. The sustainability of the solar PV project in Gaza (Component 3) depends on the ability of PENRA in identifying solutions to ensure satisfactory performance of the solar PV financing mechanism. As, by design, the pilot stage of this financing mechanism was focused on salaried employees, it is not addressing the needs of the non-salaried households. Phase 1 seeks to explore alternate solutions such as, partial subsidy, dedicated community-level solar plants and alternate solar and EE solutions. The sustainability of these efforts will further depend on the interest of Gaza-based local solar companies in moving from being suppliers and installers to developers responsible for operation and maintenance of the systems.

64. Component 3 includes the design and piloting of a PETL Liquidity Support Account and Payment System. This is a new concept and is a bespoke proposed model built upon lessons from other countries and addresses the unique Palestinian context. The initial effort will be on designing this payment system, which will include detailed definition of the governance, legal, and institutional arrangements needed to ensure its effectiveness and sustainability. Once established, this payment system is expected to help PETL in accelerating its effort and leapfrogging its ability to demonstrate creditworthiness. The financial discipline enabled by this payment system will contribute toward the long-term operational and financial sustainability of the sector.

IV. PROJECT APPRAISAL SUMMARY

A. Technical, Economic and Financial Analysis

65. **Technical Overview.** The MPA supports PENRA's vision through a four-pillar framework that strengthens the entire energy supply chain covering generation, distribution and transmission, and supports continued sector reform. Phase 1 supports further sustainable transformation of the sector by scaling up activities such as the Revenue Protection Program, the Solar PV financing mechanism, solar grants for public facilities and, upgrade and transfer of interconnection points, which started under ESPIP. As solar energy has boomed in recent years, the project will enable the strengthening of the transmission and distribution network through upgrades and building new lines to help absorb solar energy. This renewed focus on infrastructure is also crucial for increasing supply to areas facing shortages and to import more energy, especially from Jordan. The private sector is actively interested in pursuing opportunities to participate in the energy sector. This project will help design and pilot an innovative approach to help the sector improve its creditworthiness. Developing complex infrastructure and engaging the private sector require strategic planning, longer preparation times and stronger signal of government commitment, which will be enabled through the comprehensive technical assistance and capacity building component.

66. **Approach to Economic and Financial Analysis.** The economic and financial analysis has been structured in accordance with the type of investments that are being made and have been grouped into



four parts. The net benefit of an investment is established by comparing the proposed costs to the avoided costs. The economic analysis uses cash flows without taxes whereas the financial analysis does not remove taxes. The impact of avoided greenhouse gas (GHG) emissions is also considered in the economic analysis.

67. **Part One - Network investments**, will reduce short-term supply constraints by improving T&D infrastructure to safely evacuate electricity from solar PV installations to areas experiencing supply shortages. To establish the economic value of the network investments, the proposed costs (capital expenditure [CAPEX], OPEX, and grid power) of the energy being accessed were compared to the avoided costs of diesel generation (CAPEX for captive generators and related fuel costs) and the annual savings were used to calculate the net present value (NPV). For every year in the time horizon, the avoided costs of the diesel generation are greater than the expected costs of the network investments and the equivalent energy provided through the grid. The resulting NPV is US\$48.59 million (before emissions) and US\$49.98 million (after emissions). An economic internal rate of return (EIRR) calculation is not possible since all cash flows are positive.

68. **Part Two – RPP**, will reduce technical and non-technical losses associated with high-value customers to increase DISCO revenue collection and reduce the cost of lost energy. The net benefit of the RPP is calculated based on the difference between the costs of the investment (CAPEX and OPEX) and the value of the recaptured non-technical losses in terms of reduced generation. The results of the economic analysis provide an NPV of US\$60.12 million (before emissions), US\$75.84 million (after emissions), and an EIRR of 65 percent. The RPP is economically viable with a high rate of return.

69. **Part Three - Solar rooftop program**. A financing mechanism has been created to fund rooftop solar PV systems for households and MSMEs. This will be scaled up to increase the number of systems that can be supported. The economic value of the rooftop installations is the difference between the 'proposed costs' of the installations and the 'avoided costs' of diesel self-generation. The analysis produced an NPV of US\$20.77 million (before accounting for emissions) and US\$22.19 million (after emissions) and an EIRR of 143 percent.

70. **Part Four - Liquidity Support Account**. The approach for the economic analysis involves comparing the costs of the newly procured capacity (CAPEX and OPEX) to the counterfactual (or avoided costs) of increased supply from IEC. The result of this analysis is an NPV of US\$355.38 million (before emissions) and US\$357.18 million (after emissions) and an EIRR of 39 percent.

Table 5. Results of the Economic and Financial Analysis

	Economic NPV (without GHG)	Economic NPV (with GHG)	Financial NPV (with 12% discount rate)
Part One	48,593,621	49,975,350	29,712,320
Part Two	60,172,296	75,835,073	30,077,427
Part Three	20,771,400	22,188,700	14,615,950
Part Four	355,387,735	357,177,973	215,865,146
Project total	484,925,052	505,177,096	290,270,843



B. Fiduciary

(i) Financial Management

71. The financial management (FM) risk rating for the project is assessed as Substantial. The project will have an experienced PMU which has adequate capacity. There will be close supervision by the team as well as regular audits. The current FM performance for GENRP is moderately satisfactory and that of ESPIP satisfactory.

72. The current FM staff working on World Bank projects of PENRA will be the main counterparts responsible for FM arrangements. The teams have gained experience with World Bank policies and procedures and are knowledgeable about FM and disbursement processes for World Bank projects. A U.S. dollar Designated Account (DA) will be opened by the MOF for the project which will be managed by the PMU at PENRA.

73. Unaudited interim financial reports (IFRs) should be submitted to the World Bank semiannually within 45 days after the end of the period. The Grant Agreement will require the submission of annual audited financial statements within six months after year end. Project financial statements will be audited in accordance with international audit standards by an independent audit firm acceptable to the World Bank or by the State Audit and Administrative Control Bureau (SAACB); if a private sector firm is selected, the firm will be recruited on a competitive basis based on terms of reference acceptable to the World Bank. The external auditor, using relevant technical specialists as needed, will also conduct an annual technical audit. The cost of the audit will be financed from the grant proceeds. The audited annual project financial statements will be publicly disclosed.

74. FM and disbursement arrangements will be detailed in the Project Operations Manual (POM). Annex 1 provides further details on FM arrangements for the project.

(ii) Procurement

75. Procurement under the project shall be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers, dated July 2016 and revised in November 2017 and August 2018, and the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD loans and IDA Credits and Grants', dated October 2006 and revised in January 2011 and as of July 1, 2016. Procurements, subject to national procurement procedures, shall be carried out as per PA Public Procurement Law No. 8 of 2014 that became effective on July 1, 2016, with additional provisions specified in Section V of the World Bank's Procurement Regulations. The design and pilot PETL Liquidity Support Account and Payment System under Component 3 does not envisage any procurement activity and will not be subject to the World Bank's Procurement Regulations.

76. PENRA, through the PMU, will continue to be responsible for carrying out all procurements under ASPIRE. Though PENRA has experience in procurement under the World Bank-financed projects, experience under the ongoing projects suggests several risks and the overall procurement risk is assessed as High. Key risks are (a) lack of technical expertise on some of the topics to develop good quality technical specifications; (b) low bid response due to the prevailing security situation, restricted access to Gaza, and



fiscal condition; (c) integrity risks as alleged in complaints in ongoing operations; (d) lack of procurement capacity resulting in poor quality of procurement documents and delays in procurement; and (e) absence of systematic monitoring and reporting of procurement process. Several mitigation measures have been considered: (a) PENRA to strengthen the technical capacity of PMU, (b) careful design of procurement packages and better outreach to the bidding community to solicit wider bid response, (c) PENRA to share all complaints related to fraud and corruption with the World Bank and to proceed with the next stage of the selection process after getting the complaints fully resolved to the satisfaction of the World Bank, (d) drawing lessons from procurements under ongoing projects, PENRA to strengthen internal quality assurance throughout the procurement process to ensure compliance with Procurement Regulations and evaluation of bids in accordance with the criteria stipulated in the bidding documents, (e) PENRA to include a new procurement quality assurance specialist in PMU and the World Bank will provide procurement training to PMU staff, and (f) in addition to the formal supervision missions, the procurement progress for all prior and post review packages to be monitored periodically through Systematic Tracking of Exchanges in Procurement (STEP) system to identify slippages for corrective action.

77. PENRA, with support from the World Bank, has prepared the draft PPSD to determine the most appropriate selection methods for the project. Most of the contract packages will be procured following open international competitive procurement procedures using the World Bank's Standard Procurement Documents for Request for Bids. The rehabilitation of Tarqumia substation under Component 1 is envisaged to be carried out through Direct Selection with IEC who originally constructed the substation. Supply and installation under Component 3 for the targeted beneficiaries—health facilities, MSMEs, and households—is expected to be carried out using framework agreements to achieve value for money. PENRA has also prepared a Procurement Plan for the first 18 months of the project. The Procurement Plan will be updated in agreement with the World Bank team annually or as required to reflect the annual project implementation needs.

C. Legal Operational Policies



	Triggered?
Projects on International Waterways OP 7.50	No
Projects in Disputed Areas OP 7.60	No

D. Environmental and Social

78. **ESF Standards and Instruments:** the ESF standards relevant to this operation are (1) ESS1 on environmental and social assessment, (2) ESS2 on labor and working conditions, (3) ESS3 on resource efficiency and pollution prevention, (4) ESS4 on community health and safety, (5) ESS5 on Land acquisition, restriction of land use and involuntary resettlement, (6) ESS6 on biodiversity conservation, (7) ESS8 on cultural heritage, (8) ESS10 on stakeholder engagement and disclosure of information. No indigenous people nor financial intermediary were identified, thus, ESS7 and ESS9 are not relevant. The following instruments were prepared by PENRA as per the relevant standards, (1) An Environmental and Social Framework (ESMF), (2) A Preliminary Environmental and Social Assessment for the Jordan – West Bank Interconnection (PESIA), (3) Resettlement Policy Framework (RPF), (4) Labor Management Procedure (LMP), (5) Stakeholder Engagement Plan (SEP). The ESMF includes a chance find procedure to cater for chance finds during earth works and construction, and the requirements for follow-up instruments, i.e., site specific ESMPs, site-specific Resettlement Action Plans (RAPs), expanded ESIA for the interconnection line between Jordan and West Bank to cover additional dimensions once the Right of Way (ROW) and locations are fully determined. All instruments have been consulted with stakeholders and relevant parties, reviewed and cleared by the Bank.

79. **Environmental and Social Assessment.** The project will finance the construction of the 33kV line between Jericho and Ramallah of estimated total length of 14 km, some sections are underground cables, rehabilitating and energizing one Substation in Hebron, rehabilitation and reconfiguration of many interconnection points between the West Bank electricity network and Israel (IEC), upgrading two workshop for battery waste recycling in Gaza, installation and connection of PV rooftop solar modules to houses, private businesses, and public institutions. The anticipated environmental and social impacts from these activities span a wide array during the construction and operational period, including noise, dust, solid and hazardous waste generation (PCBs), interruption to traffic and municipal services and facilities, and occupational health and safety (OHS) hazards. The final determination of the ROW of the interconnection line during project implementation will provide clarity if any impacts on biodiversity are expected. The impacts during the operational phase include occupational health and safety hazards to workers and personnel, impacts of electromagnetic fields (EMF) along the ROW of high voltage lines and around substations. generation of hazardous waste at end of life of batteries, transformers, capacitors, solar panels, and other equipment.

80. The social impacts anticipated include land acquisition and impacts to livelihoods during the construction activities particularly on vulnerable Bedouin communities along the 33-kV line. Delays in implementation may pose additional contextual risks to the operation, particularly in Gaza due to the constraints on entry of materials and equipment. Some of the project locations are in "Area C" in the West Bank and close to the security fence in Gaza, thus posing potential security risk to staff, workers, and



personnel. Some of the impacts such as noise, dust, solid waste generation, and OHS hazards during construction are high likelihood. Other impacts such as spills, exposure, and pollution of PCB material, electrification and serious incidents during construction of trenches and cabling of networks are of less likelihood. The overall environmental and social risk classification (ESRC) for the operation is “Substantial”.

81. **Labor Management Procedures (LMP):** Different categories of labor involved in the project have been identified, including direct labor of the implementing agency and the beneficiary Distribution Companies (Discos), contracted labor by contractors and sub-contractors. It is not anticipated that the project will cause any labor inflow and no labor camps will be constructed. A limited number of foreign labors with specific technical expertise might be contracted, and most of the labor is local. The Labor Management Procedure (LMP) sets the rules for non-discrimination and fair treatment of workers, management of workers occupational health and safety risks, minimum age of employment, wages and compensations, incidents reporting, and worker’s grievance redress mechanisms (Workers’ GRM).

82. **Pollution Prevention:** The possible risks of pollution include hazardous and non-hazardous wastes. The non-hazardous waste includes solid waste generation during the construction of the interconnection line between the West Bank and Jordan, the 33-kV line between Jericho and Ramallah, the rehabilitation of the interconnection points and the substation in Hebron, the installation of roof top solar panels. The hazardous waste includes PCB from substations and network transformers and capacitors, battery waste at end of life from PV solar modules, and the development of the battery recycling workshops. The ESMF mandates the borrower and contractors to prepare and implement Construction- Environmental and Social Management Plans (C-ESMPs), which include but not limited to, solid waste management plans detailing the aspects of collection, transport, and disposal of solid waste, hazardous waste management plans for PCB and battery waste handling, transport, storage, and disposal.

83. **Community Health and Safety:** For all construction sites, the contractors will prepare Occupational Health and Safety plans in accordance to the Bank’s general Environmental Health and Safety Guidelines (EH&SG), and the specific EH&SG guidelines for the industry of electricity transmission and distribution. The contractors will prepare traffic and road safety plans for all construction sites part of the C-ESMPs. The contractors will prepare emergency preparedness and response plans to handle any incidents on the construction sites including spills or exposure of hazardous waste, electrification, and other serious incidents. The borrower and contractors will prepare Security and Safety Plans employing the provisions of ESS4 in relation to security personnel whenever they are used at project sites.

84. **Land Acquisition, Restrictions on Land Use and Involuntary Resettlement:** it is anticipated that the 33-kV line from Jericho to Ramallah and reconfiguration of the interconnection points with IEC may require acquisition of small pieces of land for the construction of new towers. At the time of appraisal, only preliminary design of the Jericho-Ramallah line is available, and they are pending approvals from the Israeli Civil Administration. A Resettlement Policy Framework (RPF) was prepared and disclosed by PENRA on February 23, 2020. The RPF sets the principles and procedures for the preparation of the sites- specific RAPs for land acquisition, impacts to livelihood, and for encroachments to the existing right-of-way. The existing solar PV plants which will be connected to the electricity network are considered associated facilities and technical audits, including for land issues, will be furnished by PENRA prior to the start of works to ensure compliance with the RPF provisions and other ESSs. Any associated facilities built contemporaneously to the project activities will follow the provisions of the Bank ESS standards.



85. It is not anticipated that physical resettlement will result from the project activities, the new 33 kV line will be built parallel to the IEC line. However, the IEC line passes through several Bedouin communities, some living very close to the IEC power line, and the right-of-way is encroached in some sections. Given the unique way of life of the Bedouin communities, the project will ensure their way of life is not impacted. In the course of preparation of the stakeholder engagement plan (SEP), a few Bedouin communities have been consulted and their views were taken into consideration. The final designs of the interconnection line will ensure the risks to these communities are minimized, the number of these communities, their exact location, and the consultations carried out, will be documented. The route of the transmission line is currently being reviewed by the Israeli civil administration. Upon approval of the final route of the Jericho-Ramallah transmission line by the Israeli Civil Administration, a detailed environmental and social impact assessment including, stakeholder consultations will be conducted. Procurement for the design and construction of the transmission line will only be allowed to begin after the environmental and social management plan and, if needed, a resettlement plan, have been implemented.

86. **Biodiversity Conservation:** no critical natural habitats or legally protected and internationally recognized areas of high biodiversity value were identified by the environmental and social assessment. Further assessment of the impacts on biodiversity will be conducted when the right-of-way (ROW) along the 14 km of the 33 kv line is fully determined and the PESIA is expanded and updated.

87. **Cultural Heritage:** no physical cultural resources of significance was identified on any of the project sites. Furthermore, the project activities are not expected to have any impacts on tangible or intangible cultural resources. A chance find procedure will be employed by the client and the contractors if any chance finds are encountered.

88. **Stakeholder Engagement and Information Disclosure:** Project activities involve a wide range of communities spread in West Bank and Gaza where the construction activities will take place. They include project affected parties, people affected by land acquisition; People residing in project areas; Vulnerable households and communities including women; local government authorities; Private Sector – Small to Medium Enterprises, and energy sector Institutions (namely PENRA, PETL and Electricity Distribution Companies). Other stakeholders include the Palestinian Electricity Regulatory Council (PERC); Ministry of Finance, Ministry of Health; Ministry of Social Development; Palestine Electricity Transmission Limited (PETL); Local Commercial Banks; Universities; local media and NGOs. This wide range of stakeholders mandated a detailed Stakeholder Engagement Plan (SEP). The SEP includes a methodology to reach all stakeholders, including those living in remote areas to ensure social inclusion; with emphasis on special groups such as women and the Bedouins communities. The SEP also includes measures to facilitate the participation of those with physical and other disabilities. The SEP will be continuously updated to include new locations as they become known. PENRA will develop and implement a GRM for the Project as described in different instruments.

89. The project instruments (ESMF, PESIA, RPF, LMP, SEP) have been disclosed on PENRA's Website on February 23, 2020 in English and Arabic. They were disclosed in the World Bank's website on March 5, 2020.



90. **Gender-Based Violence (GBV):** A risk assessment for Gender Based Violence (GBV) was undertaken, and the risk was determined as Moderate. Accordingly, a stand-alone GBV Action Plan will be prepared by PENRA prior to initiating construction and implementation of the project activities and will be monitored throughout the life cycle of the Project. The action plan will address the following: (i) prevent or mitigate risks of GBV/SEA that may result from interaction and collaboration between groups of actors; (ii) organize awareness raising sessions and educate the workers and the community in the project site on issues of GBV, legal rights, GRM and referral path for victims of GBV; (iii) establishing a monitoring mechanism (iv) GRM to track complaints and feedback on the response to complaints.

91. **Assessment of Borrower Capacity:** the existing capacity of PENRA to manage the wide array of environmental and social risks is limited in terms of human and technical resources, will be enhanced during project implementation by building in-house capacity for social and environmental management, and in parallel by external consultants. PENRA is committed to hire and maintain an environmental and social officer (ESO) for the entire duration of the project whose functions will include, (i) monitoring the implementation of the framework instruments (ESMF and RPF), (ii) oversee the preparation of the site specific instruments (i.e., site specific ESIs and RAPs), (iii) monitor the implementation of environmental and social plans (SEP, LMP, RAPs, site-specific ESMPs), (iv) guide the continuous process of consultations and ensure and maintain a functioning GRM, (v) ensure the ES measures are incorporated in the bidding documents and monitor compliance of contractors during construction, (vi) monitor the implementation of the GBV action plan. Similar capacity is expected to be maintained by the beneficiary institutions.

92. **The Environmental and Social Commitment Plan (ESCP):** The Environmental and social Commitment Plan was prepared by the client and cleared by the Bank. PENRA will ensure that sufficient funds (from the government, the project or non-government beneficiaries' sources), are available to cover the costs of implementing the ESCP. The ESCP includes (but not limited) to the following commitments, (i) regular monitoring of the implementation of all instruments and reporting to the Bank, including any serious incidents, (ii) preparation, implementation, and monitoring of all necessary site-specific ESMPs, LMPs, RAPs, SEPs, (iii) monitoring compliance of all contractors on the provisions of all relevant instruments, (iv) maintaining sufficient capacity for environmental management by PENRA, and cause the beneficiary distribution companies to maintain sufficient capacity for environmental and social management, (v) conducting meaningful and inclusive consultations with stakeholders and affected parties, (vi) implementation and monitoring of GBV action plan.

E. Citizen Engagement

93. To ensure the implementation of a citizen engagement mechanism with a feedback loop, PENRA will conduct a baseline beneficiary survey, followed by periodic tracer surveys and an end survey within the duration of the ASPIRE MPA to seek feedback on benefits and services provided by the program. A citizen engagement strategy will be developed to maintain continuous engagement and communication with beneficiaries and citizens overall and contribute to building trust and a social contract. In addition, ongoing citizens' feedback will be considered when implementing the activities of the MPA phases, and PENRA will publish the results of the beneficiary surveys on its website, as a key results indicator for citizen engagement.



V. GRIEVANCE REDRESS SERVICES

94. Communities and individuals who believe that they are adversely affected by a World Bank (WB) supported project may submit complaints to existing project-level grievance redress mechanisms or the WB's Grievance Redress Service (GRS). The GRS ensures that complaints received are promptly reviewed in order to address project-related concerns. Project 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/en/projects-operations/products-and-services/grievance-redress-service>. For information on how to submit complaints to the World Bank Inspection Panel, please visit www.inspectionpanel.org.

VI. KEY RISKS

95. All operations in WB&G face high risk. The overall risk rating is High.

96. **Political and governance risk is High.** On the political front, the peace process remains vulnerable and the domestic political situation remains unsettled. Political instability and the long-lasting restrictions on movement, access, and trade continue to be major impediments to project implementation, particularly in Gaza. As part of risk mitigation, political and security developments are monitored routinely by the World Bank Group to remain alert to any situation that may require adjustments to its operation. The World Bank Group also partners with local stakeholders, which could provide additional modes of implementation to ensure program and project continuity, should the need arise. Additionally, the World Bank Group retains a strong relationship with donor agencies and countries, who continue to play a constructive role in the development process. The programmatic approach would further enable sustained strategic engagement through the platform for technical coordination.

97. **Macroeconomic risk remains High.** Political instability, since the 2014 war in Gaza and the outbreak of clashes in the West Bank, increased the level of uncertainty and continues to negatively affect business confidence. Since the beginning of 2018, economic growth has stagnated in the West Bank and has seen dramatic contraction in Gaza. The productive capacity of the Palestinian economy has been eroded over the years with a significant decline in the size of manufacturing and agriculture in the economy. Also, the continued restrictions on movement, access, and trade imposed by the GoI presents a key binding constraint to private sector investment and economic growth. On the fiscal side, risks relate to the PA's persistently high fiscal deficit financed through donor grants that have been unpredictable and on a declining path since 2008. While the PA has charted a course toward lesser dependence on external aid and is undertaking the relevant reforms, it remains in a fragile situation. In summary, a further reduction in the overall level of donor assistance or lack of its predictability is a significant source of additional risk to the PA's finances and the Palestinian economy which will be closely monitored. The programmatic approach mitigates this risk by providing flexibility in implementation and a continuous learning opportunity that would enable course correction.



98. **The sector strategies and policies risk is Substantial** because of security constraints; policy implementation related delays and, uncertainties and their potential impact on the components, especially in Gaza. Since 2018, the PA and PENRA have established a high-level reform committee, which is monitoring the situation across West Bank & Gaza and developing recommendations for improvements in the sector. Regular dialogue with the PA and close supervision of the project will mitigate this risk. The ongoing programmatic technical assistance to the sector also serves as a mitigating measure as it allows the World Bank to support PENRA in identifying and exploring potential solutions.

99. **Technical design risk is Moderate** as the MPA design is informed by an in-depth analytical study (Securing Energy for Development 2017) undertaken by the World Bank, jointly with PENRA, and the lessons from ongoing operations (GENRP and ESIP) and technical assistance.

100. **Institutional capacity risk for implementation and sustainability is Moderate.** The key sector institutions—PENRA, PETL, PERC, and DISCOs—have in-house technical capacity, which is being continually supported by World Bank technical assistance through external expert support.

101. **The overall fiduciary risk is High** due to lack of capacity, security restrictions, allegations of misconduct, and procurement issues in a recent procurement package under an ongoing project. High fiduciary risk could have a negative effect on the achievement of the development objectives. Several mitigation measures have been recommended and adopted by PENRA to reduce/mitigate the risks, as per details in annex 1, which includes the appointment of a procurement quality assurance specialist in PMU.

102. **E&S risks are Substantial.** On the environment front, the substantial risks are related to OHS during construction and maintenance of T&D lines and handling of hazardous substances and wastes such as waste oil from transformers and from battery recycling factories. On the social front, the project includes small-, medium-, and large-scale construction, involving possible land acquisition, labor influx, and labor management risks as well as risks related to restriction of land use, community health and safety, and possible exclusion of some groups. The exclusion risk is higher in Gaza as some households and small businesses may not be able to access the Gaza solar financing mechanism due to restrictions on banking transactions with financial institutions not recognized by the Palestinian Monetary Authority. In addition, presence of the Bedouins along the Jericho-Ramallah interconnector and contextual risks and capacity of the implementing agencies are reasons for substantial risk category. The route of the transmission line is currently being reviewed by the Israeli civil administration. For mitigating this risk, upon approval of the final route of the Jericho-Ramallah transmission line by the Israeli Civil Administration, a detailed environmental and social impact assessment with stakeholder consultations will be conducted. Procurement for the design and construction of the transmission line will only be allowed to begin after the environmental and social management plan and, if needed, a resettlement plan, have been implemented.

103. **Stakeholder risk is Low.**

104. **Other exogenous risks are Substantial.** Given the complex socioeconomic and political context, there are risks that may be beyond the control of the PA. Specifically, for construction of the Jericho-Ramallah transmission line, a key implementation-related risk is the ability of PENRA and PETL in securing the relevant permits and approval from the Israeli civil administration. The proposed mitigation measures



include encouraging technical coordination between PENRA, PETL, and IEC. The COVID-19 pandemic poses a new and emerging threat to the Palestinian society and economy, and therefore also presents a risk to the electricity sector. This will be closely monitored to enable identification of appropriate mitigation measures.

105. **The overall risk remains High.** As described earlier, many of the risks emerge from the fragile nature of the economy and the complex political context. From a technical perspective, the risk is moderate as the technical capacity among sector institutions is sufficient and can be enhanced with access to specific technical expertise. This is common to all developing countries. However, there are several exogenous factors, which affect the ability of the sector institutions to implement and pace of progress toward the goals.



VII. RESULTS FRAMEWORK AND MONITORING

Results Framework

COUNTRY: West Bank and Gaza

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza

Project Development Objective(s)

To improve operational and financial performance of electricity sector institutions and diversification of energy sources in the West Bank and Gaza.

Project Development Objective Indicators

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
PrDO1 and Phase1-PDO1: Improve operational performance of electricity sector institutions				
Non-technical losses West Bank (Percentage)		11.00	9.00	6.00
Non-technical losses Gaza (Percentage)		20.00	18.00	15.00
PrDO2 and Phase1-PDO2: Improve financial performance of electricity sector institutions				
Share of electricity sector net-lending in West Bank (Percentage)		30.00	25.00	15.00
PrDO3 and Phase1-PDO3: Diversification of energy sources				
Electricity supply from imports (Megawatt)		36.00	80.00	80.00
Installed capacity from new IPPs in West Bank and Gaza (Megawatt)		0.00	25.00	100.00



The World Bank

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza (P170928)

Intermediate Results Indicators by Components

Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
Ph1: Improving infrastructure for regional electricity interconnections in West Bank				
Connection points upgraded (Percentage)		16.00	40.00	80.00
Length of MV lines upgraded and constructed (Kilometers)		0.00	15.00	45.00
Substation operationalized (Text)		No		Yes
Ph1: Improving sustainability of service delivery				
Number of smart meters installed under RPP-2 in West Bank (Number)		0.00	3,000.00	10,000.00
Number of smart meters installed under RPP-2 in Gaza (Number)		0.00	2,000.00	7,500.00
Share of female engineers employed in the energy sector (Percentage)		7.00	9.00	12.00
Lessons learned reports from design and pilot of PETL liquidity support account and payment system (Number)		0.00	1.00	2.00
Ph1: Enabling Private Sector Engagement in Renewable Energy				
Beneficiaries served by newly installed solar PV systems (Number)		0.00	3,000.00	5,000.00
Private capital mobilized (Amount(USD))		0.00		20,000,000.00
Share of RE capacity in West Bank (Percentage)		4.50	6.50	10.00
Beneficiary women-owned businesses reporting stable incomes due to improved electricity services (Percentage)		0.00	15.00	25.00
Ph1: Technical Assistance, Capacity Building and Project Management				
Preparation of feasibility studies completed (Number)		0.00	1.00	2.00



Indicator Name	DLI	Baseline	Intermediate Targets	End Target
			1	
PENRA publishes on its website results of citizen engagement survey (Number)		0.00	1.00	2.00
Grievances registered related to delivery of project benefits that are actually addressed (Percentage)		0.00	90.00	90.00

Monitoring & Evaluation Plan: PDO Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Non-technical losses West Bank	Average based on non-technical losses recorded for each distribution company in West Bank	Annual	Non-technical losses reported by each distribution company individually	Primary data	PENRA PMU
Non-technical losses Gaza	Non-technical losses as per Gaza Distribution Company (GEDCO)	Annual	Gaza electricity distribution company (GEDCO)	Primary data provided by GEDCO	PENRA PMU



Share of electricity sector net-lending in West Bank	'Net-lending' is a mechanism by which payments due to Israel Electricity Corp are deducted from the clearance revenue mechanism. While the mechanism works for both W. Bank and Gaza. This indicator focuses on W. Bank.	Semi-annual	Data collected by PETL's billing system	PETL's Billing system tracks IEC issued bills and payments made by each DISCO.	PENRA PMU
Electricity supply from imports	This indicator refers only to import from Jordan during Phase 1.	Annual	PETL and JDECO	Primary data based on import volume recorded by PETL and JDECO	PENRA PMU
Installed capacity from new IPPs in West Bank and Gaza	Installed capacity (MW) from new IPPs	Annual	PECC	Primary data	PENRA PMU

Monitoring & Evaluation Plan: Intermediate Results Indicators

Indicator Name	Definition/Description	Frequency	Datasource	Methodology for Data Collection	Responsibility for Data Collection
Connection points upgraded	Baseline is calculated as 35 connection points out of 210. As connection points may be consolidated in the future, a percentage is used.	Annual	PETL	PETL implementation reports	PENRA PMU
Length of MV lines upgraded and constructed	MV lines in Nablus, Jenin, Hebron, Gaza, and the	Annual	Respective Distribution	Implementation status reports	PENRA PMU



	proposed Jericho-Ramallah transmission line		Company (NEDCO, TEDCO, HEPCO, SELCO, JDECO and GEDCO)		
Substation operationalized	This pertains to Tarqumiya substation in southern part of West Bank.	Once	Implementation report	Primary data from PETL	PENRA PMU
Number of smart meters installed under RPP-2 in West Bank	Smart meters purchased for installation as Revenue protection program, stage 2	Annual	DISCOs in West Bank	Implementation status reports	
Number of smart meters installed under RPP-2 in Gaza	Smart meters installed as Revenue Protection Program stage 2	Annual	GEDCO implementation status report	Primary data	PENRA PMU
Share of female engineers employed in the energy sector	Number of women formally employed in govt. and private energy institutions	Bi-Annual	Public and private sector government agencies	Survey	PENRA PMU
Lessons learned reports from design and pilot of PETL liquidity support account and payment system	Lessons learned report to capture insights from the collaborative process for designing the liquidity support account and payment system	Once	Design committee	Interviews	PENRA PMU



Beneficiaries served by newly installed solar PV systems	this indicator will be disaggregated by: (i) number of public facilities; (ii) number of MSMEs (also by gender); (iii) number of HHs (of which vulnerable/ FHH)	Bi-annual	Implementation report	Number of beneficiaries served by the systems	PENRA PMU
Private capital mobilized	Investment in the solar IPPs by private sector developers, enabled by the PETL liquidity support account.	Bi-annual	PETL and IPP	Primary data from PPA signed with IPPs	PENRA PMU
Share of RE capacity in West Bank	The proportion of RE in the total energy mix including all imports and domestic generation. Baseline is calculated as 50 divided by 1100.	Annual	PECC and PCBS	Primary data on generation capacity	PENRA PMU
Beneficiary women-owned businesses reporting stable incomes due to improved electricity services	This refers to women owned SMEs that benefit from the financing mechanism for solar PV systems	Bi-annual	Women owned businesses	Survey	PENRA PMU
Preparation of feasibility studies completed	Feasibility studies for priority infrastructure projects for financing in Phase 2	Once	PENRA, PETL or DISCOs	Implementation report	PENRA PMU
PENRA publishes on its website results of citizen engagement survey	citizen engagement indicator	PENRA will conduct the first beneficiary	PENRA	Beneficiary survey	PENRA PMU



		survey during the first year of implementation, the second one at mid-point and the third one during the last year of MPA implementation.			
Grievances registered related to delivery of project benefits that are actually addressed	Related to grievance redressal mechanism	Annual	GRM	Implementation status report	PENRA PMU



ANNEX 1: Implementation Arrangements and Support Plan

COUNTRY: West Bank and Gaza

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector in the West Bank and Gaza

Project Institutional and Implementation Arrangements

1. PENRA is the executing agency of the project. The agency's technical and implementation capabilities were evaluated. PENRA hosts a PMU which is implementing GENRP and ESPIP. The PMU core team comprises a Project Director, Procurement Officer, Accountant, Project Engineer, and two engineers to provide procurement support. The PMU ensures coordination with the PETL, PERC, and the DISCOs on all equipment and technical assistance to be provided under the project.
2. The primary responsibilities of the PMU include the following:
 - Providing assistance to PENRA on overall project management and implementation supervision
 - Preparing bidding documents for procurement packages and executing bidding process
 - Monitoring and reporting project performance against the agreed indicators
 - Preparing and submitting progress reports to the MOF, PENRA, the World Bank, and all other financing agencies, as required
 - Managing the financial aspects of the project
 - Preparing and submitting IFRs and disbursement forecasts to the World Bank
 - Organizing external yearly audits of project financial statements, including expenditures made through the DAs and statements of expenditure (SOEs)

Project Implementation

3. The estimated period of MPA implementation is eight years. PENRA, with the assistance of the PMU, will be responsible for the implementation of all program phases.

Financial Management, Disbursements, and Procurement

Financial Management

4. The proposed project will be implemented by the existing PMU located at PENRA's headquarters in Ramallah. PENRA, currently handling the implementation of the ongoing GENRP, will be responsible for record-keeping and overall FM. The PMU is adequately staffed with an FM team experienced in implementing similar projects under the World Bank's FM guidelines, policies, and procedures. The PMU will be responsible for handling the FM and disbursements aspects for this project, including preparing and issuing the operating budgets and all the progress and IFRs and annual audited financial and technical audit reports. It will also be responsible for contract management including the review and approval of consultants' deliverables and the receipt/inspection and acceptance of goods and works, while the release of payments to the consultant/supplier/service provider/contractor in accordance with the signed contract and maintaining related financial records will be conducted by the financial controller at PENRA.



5. **Budgeting and flow of funds.** A project budget and detailed disbursement will be prepared by based on the Procurement Plan and implementation schedules, the project budget will be consolidated by the PMU for all MPA components. Advances on Components 1, 2, and 4 will be channeled to a main DA opened by the MOF and managed by the PMU, in a commercial bank acceptable to the World Bank (in Ramallah). Additionally, Component 3 (financing mechanism) grant will flow from the main account to another sub-DA and loan repayment will also be deposited to this subaccount. No funds will be channeled to Gaza and the financing mechanism, including loan repayments, will be completely managed by PENRA. Figure 1.1 presents the funds flow for the project.

6. **Internal control.** Project control procedures will follow the PENRA internal control procedures. The PENRA internal control procedures are summarized as follows: (a) PMU technical team review and approval, (b) Procurement Officer review and approval and Financial and Administrative Manager review and approval, and (c) MOF Financial Controller review. Moreover, internal control over the project, including the financing mechanism, will be detailed in the FM Policies and Procedures Manual to make sure that there are clear roles and responsibilities and segregation of duties.

7. **Accounting and reporting.** The financing mechanism will be considered a separate accounting entity. The accounts should be kept on an accrual basis so that expenditures can be related to revenues and assets subject to good accounting control. The PMU will keep adequate records and implement proper procedures to ensure that

- Expenditures are made only for goods and services required to accomplish the objectives of the fund;
- Rates charged for services provided are related to the costs of providing them; and
- To help accomplish these objectives, the record-keeping guidelines will be outlined in the comprehensive financial policies and procedures manual. More specifically, financing mechanism requires
 - A general ledger including all asset and liability accounts;
 - A detailed accounts receivable subsidiary ledger with financial claims on third parties, which should be reconciled to the general ledger control account at the end of each accounting period;
 - An aged accounts receivable report, which should be produced monthly from the detailed records for review and follow-up of overdue accounts;
 - Detailed inventory records, which should be reconciled to periodic physical counts and at the end of each accounting period to the general ledger balance; and
 - Detailed fixed asset records, which should be reconciled to periodic physical counts and to the general ledger balance.

8. **Reporting requirements.** The PMU will be responsible for preparing the following financial reports. These statements must be prepared in accordance with international financial reporting standards applied on a consistent basis and are subject to audit.

- Statement of financial position
- Statement of results of operations
- Statement of changes in financial position



9. In addition, the PMU will prepare semiannual IFRs and will submit them to the World Bank not later than 45 days after the end of the reporting period. IFRs will be comprehensive and cover all aspects of the project and not only the portion related to the World Bank.

10. **Annual external audit.** The project's financial statements will be annually audited by a qualified independent auditor acceptable to the World Bank, in accordance with internationally accepted auditing standards and terms of reference acceptable to the World Bank. In addition to the financial audit, the recipient shall submit a technical audit report which shall be done in accordance with the International Standards on Auditing 620. The audited financial statements and the technical audit report for each such period shall be furnished to the World Bank not later than six months after the end of the period. Among other requirements, the auditor will be required to

- Ensure that the Gaza solar PV system financing mechanism beneficiaries have been selected in compliance with eligibility criteria;
- Ensure that contracts have been awarded in accordance with World Bank Procurement Guidelines and procedures; and
- Conduct field visits to WB&G inventories to count, reconcile, and verify procured assets.

11. **Involvement of the SAACB.** To prompt good governance over the financing mechanism after project closure, it is envisaged that external audit assignment will be handed over from the private audit firm to the SAACB at Year 3 or 4 of the project life. This will ensure continued auditing of the financing mechanism after project closure.

12. **Staffing.** The PMU financial team will be responsible for managing the grant resources and all related financial transactions. The PMU includes a Finance Director and two accountants with relevant accounting background and experience in handling the FM and disbursements aspects of World Bank-funded projects. The PMU FM staff is familiar with the World Bank FM and Disbursement Guidelines. However, FM performance has been moderately satisfactory. Due to the requirement of the FM management of the financing mechanism, FM capacity may require strengthening with regard to staffing and training.

13. **Supervision plan.** The proposed project has a Substantial FM risk rating before mitigating measures. The project is implemented by the PENRA PMU with sound capacities. Hence, consistent with the risk-based approach to supervision, the supervision activities will consist of field visits to the PMU and GEDCO, supplemented by desk reviews of external audit reports, semiannual financial reports, and enquires with the project staff, as needed. The World Bank will carry out field FM supervision mission at least once every six months. The FM supervision mission will assess the adequacy of the FM arrangements at the PMU. As and when required, other FM supervision tools such as SOE reviews and joint missions with procurement will be used in an effort to periodically monitor the adequacy of FM arrangements.

Disbursements

14. Two separate U.S. dollar DA will be opened by the MOF, one for each grant agreement, and will be operated and managed by the PMU. Deposits into, and payments from, the DA will be made in accordance with the provisions that will be stated in the Grant Agreement and will be outlined in the World Bank 'Disbursements Guidelines for Projects'. Disbursements from the World Bank's grant will



follow the transaction-based method, including advance, direct payments, reimbursement, and special commitments. The initial deposit into the DA will be based on a six-month forecast prepared by the PMU and submitted with the withdrawal application. Subsequent disbursements into the DA will be based on SOEs and accompanied by withdrawal applications, reconciled bank statements, and copies of all bank statements. Once disbursement conditions are met, the Liquidity support account will be paid through Direct Payment. The supporting documentation for requests for direct payment should be records evidencing eligible expenditures (e.g., copies of receipt and supplier's invoices).

Procurement

15. **Applicable Procurement Regulations.** Procurement under the project shall be carried out in accordance with the World Bank's Procurement Regulations for IPF Borrowers, dated July 2016 and in revised November 2017 and August 2018, and the 'Guidelines on Preventing and Combating Fraud and Corruption in Projects Financed by IBRD loans and IDA Credits and Grants', dated October 2006 and revised in January 2011 and as of July 1, 2016. Procurements, subject to national procurement procedures, shall be carried out as per PA Public Procurement Law No. 8 of 2014 that became effective on July 1, 2016, with additional provisions specified in Section V of the World Bank's Procurement Regulations. PENRA will use the World Bank's Standard Procurement Documents and complaint handling procedures outlined in World Bank's Procurement Regulations for procurements under national procurement procedures. Design and pilot PETL Liquidity Support Account and Payment System under Component 3, does not envisage any procurement activity and will not be subject to the Procurement Regulations.

16. **Procurement arrangements.** PENRA, through the PMU, will continue to be responsible for carrying out all procurements under ASPIRE. PENRA will carry out procurement in close coordination with the beneficiary electricity sector institutions: PETL, PERC, and the six DISCOs in WB&G. PENRA will work closely with these institutions on all technical aspects of procurement such as preparation of technical specifications and terms of references, inspection and acceptance of goods and, review of consultants' deliverables.

17. **Procurement capacity and risk assessment.** The procurement risk is assessed as High. Though PENRA has experience in procurement under the World Bank-financed projects, based on experience from the ongoing projects the following risks and relevant mitigation measures have been considered.

Key Risks	Mitigation measures
(a) lack of technical expertise in developing good quality technical specifications on some of the topics leading to cancellation of procurement processes and rebidding	(a) PENRA to strengthen the technical capacity of PMU by recruiting technical experts in the relevant fields to support PENRA throughout the procurement process including review of technical specifications according to the best international practices as well as to build PENRA's project management capacity. In addition, World Bank's technical experts will continue to support PENRA, PETL, and DISCOs in preparing high-quality broad-based technical specifications with the aim of obtaining adequate bid response.



(b) low bid response due to prevailing security situation and restricted access to Gaza, and fiscal crisis leading to delays in payments and possible boycott of the bidders for participating in public tenders	(b) careful design of procurement packages based on market analysis and PPSD. to solicit wider bid response. In addition, PENRA will conduct vendors conference by inviting local and international bidders to promote business opportunities and induce potential bidder's interest in the bidding opportunities under ASPIRE
(c) integrity risks as alleged in complaints in ongoing operations	(c) PENRA to share all complaints related to fraud and corruption with the World Bank and to proceed with the next stage of the selection process after getting the complaints fully resolved to the satisfaction of the World Bank. In addition to regular post review on an annual basis, the World Bank may conduct an Independent Post Review in case the procurements under the project reveal red flags. Prior review thresholds are set up considering procurement risk as High.
(d) risk of procurement non-compliance in case of unjustified rejection of lower priced bids	(d) Drawing lessons from procurements under ongoing projects, PENRA to strengthen internal quality assurance throughout the procurement process to ensure compliance with Procurement Regulations and evaluation of bids in accordance with the criteria stipulated in the bidding documents. In addition, the World Bank team will closely monitor all contracts, whether prior or post review.
(e) Heavy workload on existing procurement staff, and lack of procurement capacity resulting in poor quality of procurement documents requiring amendments to bid documents, extension of bid opening, and delays in evaluation	(e) PENRA to strengthen the existing PMU structure to include a new procurement quality assurance specialist who will be responsible for establishing the entire procurement process from planning to contract completion, setting service standards for timely completion of procurement activities, and monitoring and reporting performance against these service standards.
(f) absence of systematic monitoring and reporting of procurement process.	(f) In addition to the formal supervision missions, the procurement progress for all prior and post review packages to be monitored periodically through Systematic Tracking of Exchanges in Procurement (STEP) system to identify slippages for corrective action.

18. **PPSD.** PENRA, with support from the World Bank, has prepared the draft PPSD to determine the most appropriate selection methods for the project. While several procurements under the project will



build on the similar procurements being carried under the ongoing ESPIP, the PPSD considers the lessons learned from the ongoing procurements under ESPIP. The draft PPSD suggests that the main procurement activities to be procured under the project include contracts for supply and installation for metering and management tools for PETL's connection points, upgrading of the existing interconnection with Jordan, rehabilitation of Tarqumia substation, supply of smart meters for WB&G utilities, supply and installation of small- and medium- solar systems, and grid rehabilitation and integration. Most of the contract packages will be procured following open international competitive procurement procedures according to the World Bank's Standard Procurement Documents for Request for Bids. The rehabilitation of Tarqumia substation under Component 1 with an estimated cost of US\$2.0 million is envisaged to be carried out through Direct Selection with IEC, who initially constructed the substation. As per agreement between the PA and the GoI, IEC is the only authorized party to conduct the rehabilitation work to enable the warranty period to be valid. This contract is under discussion between PENRA and IEC. PENRA will follow the World Bank's Standard Procurement Documents for this Direct Selection. Supply and installation of solar systems under Component 3 for the targeted beneficiaries—health facilities, MSMEs, and households—is expected to be carried out using framework agreements to achieve best value for money.

19. **Procurement Plan.** PENRA has prepared a draft Procurement Plan for the first 18 months of the project. The Procurement Plan is approved by the World Bank. The Procurement Plan will be updated in agreement with the World Bank team annually or as required to reflect the annual project implementation needs.

20. In addition to the prior review of contracts, the World Bank will carry out two supervision missions a year and a regular ex post procurement review of contracts annually.

ANNEX 2: Detailed Project Description

COUNTRY: West Bank and Gaza

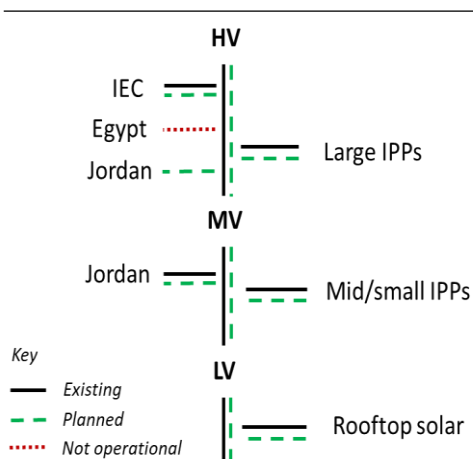
Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector

1. The MPA pillars and corresponding components under Phase 1 of ASPIRE are described in the following paragraphs.

Pillar 1: Infrastructure

2. The immediate focus of regional power interconnection infrastructure is to enable improved imports from Israel and Jordan, with the possibility of also enabling imports from Egypt in the future. This

Figure 2.1. Infrastructure



is linked with the internal power transmission, within WB&G, as the imported electricity needs to be transported from the points of supply to the consumers. While all areas have suppressed demand, some areas are facing severe shortages, leading to load shedding and an increasing use of diesel generators by utilities and consumers. In extreme cases, it is also resulting in the inability of existing industrial units to operate and hindering establishment of new units. The requirement for evacuation of power from the point of supply also applies to IPPs (including solar PV plants). While all plants are expected to prepare detailed grid studies to ensure access to nearest point of connection to the grid, in many areas, the existing T&D grid requires upgrades to ensure that the electricity reaches the end user. Figure 2.1 provides a simplified high-level view of the existing systems

for upgrading and planned additional points of supply from imports and IPPs. This pillar will primarily support PETL, with the involvement of DISCOs, depending on the location of points of supply and prioritized customer demand.

Component 1: Improving Infrastructure for Regional Electricity Interconnections in the West Bank and Gaza

3. The project activities under this component will be led by PENRA, PETL, and in some cases by DISCOs and will focus on strengthening infrastructure for medium and high voltage interconnection and renewables. This would strengthen the ability of PETL to manage electricity supply from Jordan and Israel into WB&G.

Subcomponent 1.1: Rehabilitation of PETL-IEC connection points

4. The Palestinian and Israeli electricity systems are highly interconnected in West Bank. IEC supplies electricity to the West Bank consumers at around 200 connection points through electricity networks operated by DISCOs and municipal authorities. Under the terms of the PPA between IEC and PETL, the management of these connection points will be taken over by PETL as per a pre-agreed schedule. The



rehabilitation of the first set of 32 connection points, which are considered the highest priority, is being financed under the earlier World Bank project (ESPIP). Procurement for this package is under way. The remaining 170 connection points, which require significant upgrades and could include consolidation of points are included in this project. PETL is planning to categorize these connection points into four or five groups to facilitate the required intervention. The equipment for the rehabilitation of these connection points will mainly include 22 or 33 kV power cables, switchgear, control, auto reclosing, metering, and communication.

Subcomponent 1.2: Upgrade of MV¹⁸ power lines in Nablus, Jenin, Hebron and Gaza to enable additional electricity supply

5. The electricity distribution infrastructure in Nablus, Jenin, and Hebron is served by four DISCOs: Northern Electricity Distribution Company, Tubas Electricity Distribution Company, Southern Electricity Company (SELCO), and Hebron Electricity Production Company. The main source of electricity is IEC, which supplies these DISCOs through medium- and low voltage-connections. Given the increase in customers and daily consumption, the overall demand in each of the DISCOs has increased. As a result, these four DISCOs are facing supply shortages with increased incidences of load shedding and poor quality of supply. The DISCOs have resorted to rationed schedules for consumers. In some cases, diesel generators are used to cover the shortages with high operating costs partially subsidized by the PA. The scope of this subcomponent is to cover the urgent imminent needs of DISCOs by improving the low- and medium-voltage system. Possible interventions could be one or more of the following in each DISCO:

- Replacement of overhead lines with underground cables in residential areas
- Installation of voltage regulation on the network or connection points
- Enhancing of imports by upgrade of a few low-voltage to medium-voltage connection points and merger of small grids into one
- Replacement of medium-voltage lines with higher-size power lines of increased capacity
- Replacement of low-capacity power transformers with high-capacity power transformers

Subcomponent 1.3: Rehabilitation of Tarqumia substation

6. The 161/33 kV Tarqumia substation, located in southern West Bank, is one of the four high voltage substations that are being implemented by PETL under arrangements agreed with IEC. The construction, testing, and commissioning of the four substations was entrusted to IEC on behalf of PETL and funded by European Investment Bank. The Tarqumia substation was fully constructed including 161 kV interconnection with two incoming transmission lines; two 161/33 kV, 50 MVA power transformers; 161 kV and 33 kV switchgear; control equipment; relay panels; and other facilities. In May 2019, equipment such as batteries, battery chargers, protection relays, distribution boards, energy meters, control cables, and fire alarm system were damaged or stolen from the substation. Since the long-term PPA between PENRA and IEC is not signed yet, this substation is still under IEC responsibility during working hours. However, the incidence of theft occurred overnight; thus, PETL remains responsible for replacing the lost and damaged equipment. Given the high importance for early commissioning of the substation, the

¹⁸ MV = Medium voltage.



equipment and materials lost will need to be procured under the existing contract with IEC for subsequent installation, testing, and commissioning.

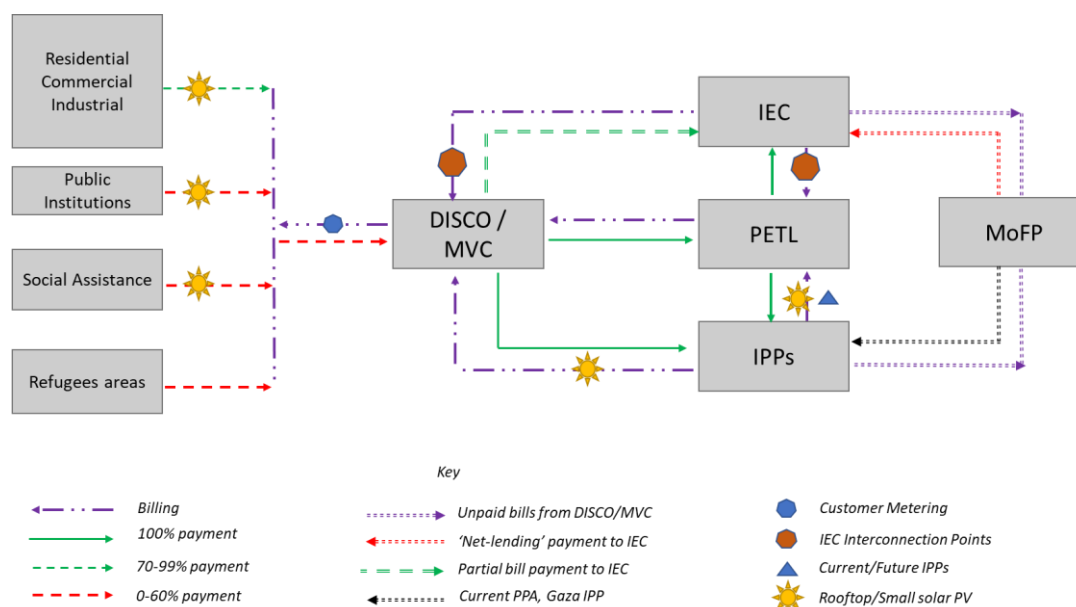
Subcomponent 1.4: Design and build of MV line and infrastructure between Jericho and Ramallah

7. The purpose of this medium voltage line is to evacuate imported electricity from Jordan and the surplus capacity of the existing solar PV plant in Jericho after meeting local demand for transfer to Ramallah to meet the increasing demand. The total length of the 33kV line route between Jericho and Ramallah is expected to be around 14 km and may include some underground cable sections. The implementation of this infrastructure requirement by design and build contracting will facilitate early completion of the additional facilities thus enabling evacuation of electricity to Ramallah. A small portion of the proposed route of the new line crosses area C where the Israeli civil administration permits are needed. The route of the transmission line is currently being reviewed by the Israeli civil administration. Upon approval of the final route of the Jericho-Ramallah transmission line by the Israeli Civil Administration, a detailed environmental and social impact assessment including, stakeholder consultations will be conducted. Procurement for the design and construction of the transmission line will only be allowed to begin after the environmental and social management plan and, if needed, a resettlement plan, have been implemented.

Pillar 2: Service Delivery

8. This is complementary and additional to Pillar 1, focusing on network management through adoption of appropriate technological solutions, including SCADA systems, switchgear, and other control and protection mechanisms to improve quality of supply at the low voltage, distribution level. This pillar also covers the demand-side focused activities. These include expansion of the RPP and scaling-up of the deployment of smart meters, till the smart meter deployment reaches customers who account for 60–80 percent of the total consumption. The smart metering program could also include targeted schemes for public institutions, social cases, and refugee areas. Pillar 2 would also include interventions in sectors, such as health sector which is a humanitarian priority, that are heavily affected by power cuts and the need to maintain expensive diesel back-up generators. The interventions would include rooftop solar PV systems and energy efficiency measures.

Figure 2.2. Financial Flows in the Electricity Sector



Component 2: Improving Sustainability of Service Delivery of DISCOs

9. The activities under this component will be led by PENRA and the respective DISCOs in WB&G. Despite some improvements, the electricity sector suffers from operational and financial problems due to high losses and low collection rates. Bill collection rates are particularly low in Gaza and in refugee camps in the West Bank due to difficult living conditions and a culture of nonpayment. This component aims for sustained improvement of operational performance of the five DISCOs in the West Bank and GEDCO, the only DISCO in Gaza. Effectively, this is a continuation of the first stage of the RPP for improved metering and billing systems in WB&G. The RPP includes smart meters to improve billing and collection for the high-value segment of consumers, which represent the largest electricity consumption and sales. RPP stage 2 will build on the Advanced Metering Infrastructure (AMI) installed through ESPIP.

10. The first stage of the RPP covers around 23 percent of the total electricity consumption across the five DISCOs by targeting the top 15,000 customers based on their consumption profile. This is targeting all the six DISCOs in WB&G and will enable support to new DISCOs that will be created as part of the ongoing sector consolidation efforts. The simultaneous planning and installation across all DISCOs were aimed to ensure harmonization of operational and reporting capabilities of DISCOs and to strengthen planning and monitoring across the sector. Based on the detailed technical review of the prevailing metering systems and key challenges, uniform installation of AMI was planned in the six DISCOs across WB&G. Under this project, the second stage of RPP will be implemented that will target the next 20–30 percent of the largest consumption block across the six DISCOs in WB&G. This phase will also include solutions to address the specific needs of public institutional customers, poorest communities, and vulnerable populations.

Pillar 3: Private Sector Participation in Electricity Sector



11. As described in earlier sections, renewable energy policies have captured the interest of the private sector, and combined with low prices for solar technologies, the private sector has acquired licenses for nearly 145 MW of solar PV capacity. Due to geographical constraints, most of the plants are small with the largest currently proposed plant being 30 MW. The increased availability of natural gas is also enabling the options for gas-fired power plants in WB&G. Currently, two potential IPPs are under consideration, with a 485 MW IPP in advanced stage of discussion in northern West Bank and a 150 MW plant in initial stage of exploration. All IPPs, large and small, share common challenges, primarily the lack of creditworthiness of the off-takers (PETL, DISCOs, or LGUs) and the risk of reform reversal, creating a high risk of nonpayment. To address PETL's creditworthiness and mitigate barriers to private sector investment and power infrastructure development, Pillar 3 includes the design and scale-up of a financial mechanism. This includes key sector-building activities to be undertaken by MOF, PENRA, and PETL to expand the PETL Unified Account and establish bill payment systems to enable PETL cash flows and ensure payment of certain covered payment obligations of PETL under approved PPAs. Phase 1 envisages the design and piloting of this mechanism, with subsequent phases focusing on enhancement and scale-up.

12. In addition to IPPs, WB&G has seen a blooming of the rooftop solar PV systems market, with increased participation of local companies as suppliers, installers, and service providers. These systems are attractive to residential and commercial sectors and being extensively deployed, through donor support, in public facilities. Pillar 3 seeks to enable faster and more sustainable growth in the rooftop solar sector. There is a need to continue to scale up the ongoing efforts through the rooftop solar financing mechanism to both increase the availability of zero-cost financing and good quality equipment to customers, especially SMEs in WB&G. The financing mechanism requires certainty of repayment to ensure its sustainability, which led to it being restricted to salaried people and financially robust SMEs, with the additional requirement of having access to sufficient roof space. This is excluding a vast majority of the households, especially poor and vulnerable families, that live in densely populated areas in high-rise buildings. To address this issue, this pillar will also focus on the opportunity to construct community solar plants that provide dedicated supply to these neighborhoods, thereby increasing the hours of supply while decreasing the subsidy burden. All new supply—small and large scale, IPPs, or own use—creates an operational challenge in terms of evacuating the electricity. This challenge is addressed through Pillars 1 and 2. The ability of the electricity sector to benefit from the prevalence of IPPs depends on robust application of the processes for selecting IPPs, licensing, and establishing wholesale and retail tariffs. These issues are discussed in Pillar 4.

Component 3: Enabling Private Sector Engagement in Renewable Energy

13. The renewable energy offers a growing source of energy in WB&G due to obvious advantages of this technology in WB&G. As per the Securing Energy for Development study, with 3,000 sunshine hours per year and global horizontal irradiance of over 2,000 kWh/m², WB&G ranks among the world's top locations for construction of solar systems. Solar energy represents one of the few untapped supply options for WB&G. Overall power that can be generated by solar PV is estimated as 4,081 MW in the West Bank (includes areas A, B, and C) and 165 MW in the Gaza strip. The activities under this component will be led by PENRA, in coordination with DISCOs, relevant line ministries, and local commercial banks. The subcomponent related to health facilities will be implemented by PENRA in coordination with the Ministry of Health. The gender activities, as outlined in more detail in table 2.1, will be implemented by PENRA in



coordination with the Ministry of Social Development and other experienced stakeholders and with World Bank support.

Subcomponent 3.1: Grid reinforcement and upgrade to enable evacuation of utility-scale Renewable Energy in the West Bank and Gaza

14. **Utility-scale solar.** As outlined in the Securing Energy for Development study, energy security could be enhanced by greater diversification of power sources in WB&G, including the development of indigenous gas-fired and solar power options. Until availability of pipeline gas is assured, the energy sector will need to focus mainly on solar PV-based power plants. RE represents the only truly independent form of power supply that does not rely on imports of electricity or fuel. Currently, over 96 percent of energy supply in WB&G is dependent on Israel in terms of either direct electricity imports or fuel imports for the GPP. Solar energy represents one of the few untapped supply options, in a context where negotiations with neighboring countries on increasing power supply options are quite challenging. Nevertheless, it is proving challenging to kick-start renewable energy investment in the Palestinian context.

15. PENRA's renewable energy targets, set in 2012, aimed to generate 130 MW of power supply from domestic renewable resources by 2020. As of March 2017, less than 15 percent of that target had been achieved. After a slow start, interest in renewables has noticeably increased in the past three to four years, following the cabinet adoption of the renewable energy strategy in 2012 and the promulgation of the Palestinian Renewable Energy Laws released in 2015. The renewable energy sector has faced two main challenges to date—first, inability of PETL and DISCOs to secure PPAs with a bankable off-taker and second, there is a lack of available infrastructure for power evacuation. Under this subcomponent, World Bank financing will target supporting the provision of infrastructure for power evacuation.

16. PENRA, with support of the international community and the private sector, has been actively promoting utility-scale solar in WB&G. Owing to land constraints, most of the licenses issued so far are in area A and range between 250 KWp and 5 MWp. As per regulations, PPAs for less than 1 MWp can be signed directly between an IPP and the local utility (DISCO or municipal/village council) and PPAs above 1 MWp need to be signed with PETL or DISCOs. The new IPPs are required to prepare a detailed grid study, in coordination with PENRA, the relevant DISCO, and PETL. However, due to budgetary limitations, technical capacity, and access constraints, DISCOs seek PETL support for evacuation of the larger renewable energy installations. PENRA and PETL are preparing a prioritization and selection criterion to identify the solar installations, together with a list of equipment and services needed for each solar PV installation for integration with the electricity network. The project will provide urgent support to PETL/DISCOs to procure equipment, material, and services needed for evacuation from the solar PV installations. The expected number of installations and their technical parameters, such as capacity to be evacuated and voltage at the evacuation point, are to be assessed by PETL. Given that some of the solar PV plants are in an advanced stage of completion, prompt support for the financing of the components is needed, for which the stakeholders—including DISCOs, PETL, and PENRA—are coordinating their efforts.

17. **Small-scale solar.** In recent years, rooftop solar PV has seen promoted as an alternate source of energy in several parts of the West Bank. This has resulted in saturation in some areas within select DISCOs causing potential stability concerns, which requires the networks to be upgraded and secured. PENRA, in



coordination with the DISCOs, is currently defining prioritization criteria for this activity. Funding allocation may be needed for network upgrade (medium voltage) by some of the DISCOs.

Subcomponent 3.2: Scale up solar solutions for MSMEs, households and key sectors

18. The financing mechanism for rooftop PV systems for small businesses (MSMEs) in Gaza will also be expanded to support small businesses in the West Bank for purchase of solar PV kits. This will build on experience from ESPIP in Gaza to further identify options to support female-owned businesses, especially micro-establishments. There will be pilot expansion of the Gaza solar financing mechanism for rooftop PV systems to poor and vulnerable households in coordination with Ministry of Social Development. The current financing mechanism requires beneficiaries to repay 92-97 percent of the cost of the solar PV system (2.5 KWp, 3.0 KWp, and 5.0 KWp) over two to six years. However, with the current extremely high unemployment and poverty rates in Gaza, the most vulnerable populations may not be able to benefit. This also applies to pockets of poverty in the West Bank. Based on initial findings, these households may require partial grant (40–60 or even 50–70 percent) to be able to afford the system. Furthermore, due to limited availability of roof space and high share of electric water heaters, solar water heaters will be considered. This pilot initiative will attempt to establish a new ‘window’ of the financing mechanism to provide targeted support to poorest and most vulnerable households. This activity will utilize recently completed poverty mapping exercise. This pilot scheme will also explore other models such as community or shared solar, especially in multi-family dwellings and densely populated neighborhoods. In Gaza, this subcomponent will continue building on ESPIP efforts and expand it to all solar solutions and energy-efficient products (lighting, refrigerator, and so on) to target female heads of households who represent 9.4 percent of households in Gaza. This subcomponent will provide preliminary face-to-face energy diagnostic and advice on energy-efficient products and solar solutions.

19. **Scale-up grant Support for Renewable Energy and Energy Efficiency in Gaza and the West Bank.** This activity will scale up financing under ESPIP to help key sectors (health, education and agriculture) in Gaza reduce their electricity demand and diversify the energy supply. Given the continued electricity supply constraints in the Gaza strip, creates high-level of reliance on diesel generators. Unfortunately, health facilities, schools, farms suffer from electricity shortages, resulting in closure of parts of the facilities; reduced working hours; and, in some extreme cases, complete closure. ESPIP is currently supporting renewable energy installations in one hospital and five clinics. This subcomponent will support installation solar solutions including solar thermal technologies and energy efficiency measures, including heating, cooling and lighting in select facilities.

Subcomponent 3.3: Design and pilot PETL Liquidity Support Account and Payment System

20. The project aims to design and develop a Liquidity Support Account and Payment System (‘payment system’) enabling PETL to support utility-scale solar PV projects, which are competitively procured in WB&G conditioned upon the ability of PENRA/PETL to establish this payment system within a predefined period. This account can be designed to enable expansion for other IPPs in the future.

21. Currently, the PA provides ad hoc liquidity support to cover power sector cash shortfalls by allowing costly setoffs against the net-lending. Instead of IEC electricity bills being deducted by the Israeli MOF from the clearance revenue, which is the PA’s largest source of income, the PA seeks to proactively

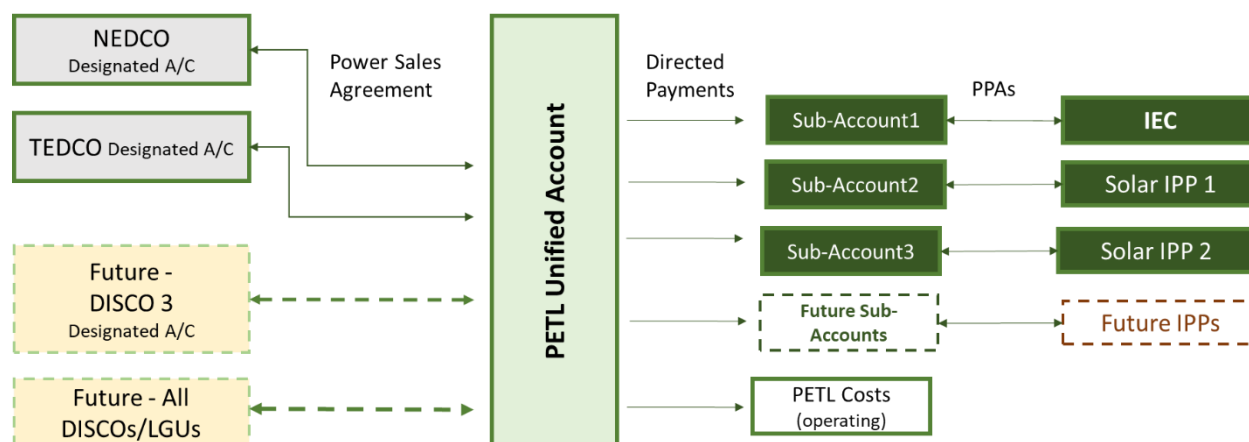
pay PETL/DISCOs, which can then settle IEC's bills directly on time. This is crucial to reduce, and ultimately stop, the continued accrual of debt. Going forward, the PA seeks to eliminate these costly setoffs through

- (a) Expansion of the **PETL Unified Account** to include future DISCOs/LGUs and approved PPAs;
- (b) Establishment of an **MOF Electricity Bills Payment System** to address current cash flow shortfalls that arise due to nonpayment by government entities, refugee camps, and social cases (pro-poor consumers) as well as other DISCOs; and
- (c) A **Liquidity Support Account** to backstop PETL's payment obligations to approved IPPs.

22. The expanded PETL Unified Account, the MOF Electricity Bills Payment System, and the Liquidity Support Account will form the basis of an agreement between the PA and the World Bank (an undertaking/policy letter) and reflect the following principles.

23. **PETL Unified Account.** The PETL Unified Account is the system for receiving payments from DISCOs under the interim PPA with IEC. It also services two solar PPAs that supply to the DISCOs where they have Power Sales Agreements (PSAs). PETL has a two-year track record of successfully operating the Unified Account. The MOF is committed to expanding the application of the PETL Unified Account to include all other DISCOs and future IPPs (utility-scale solar and gas-fired). All sector revenue from electricity sales and the Electricity Bills Settlement Mechanism will be deposited into, and managed through, the PETL Unified Account and will include a predetermined cash flow waterfall for prioritized payment obligations to ensure transparency and predictability in cash flows and shortfalls. Any surplus in the PETL Unified Account that exists after all payments are made will flow to the Liquidity Support Account to support approved IPPs.

Figure 2.3. Existing PETL Unified Account



24. **PETL cash flow waterfall.** A cash flow waterfall shows the priority of cash inflow and outflow and ensures that each cash flow item occurs at the correct seniority to other items.

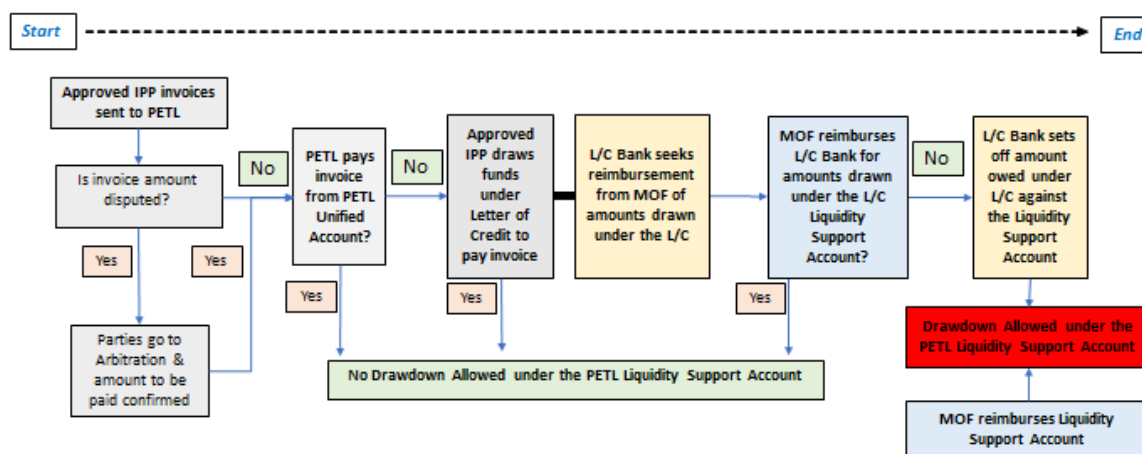
25. **Electricity Bills Settlement Mechanism.** The MOF feels the burden of the electricity sector in the form of deductions from the clearance revenue. The electricity bills paid to IEC through the net-lending mechanism come from 100 percent of electricity bills in Gaza; unpaid bills from refugee camps, social assistance, and public sector bills; unpaid portion of LGU bills; and fees and charges. With the expansion



of the PETL Unified Account, the MOF will commit to providing budgetary support to meet these cash flow shortfall to the sector-wide PETL Unified Account. Annual budget allocations for each ministry in WB&G include an element for electricity cost. Under the revised system, these monies could either be paid directly by line ministries to the service provider or withheld by the MOF from the budget of the line ministries and forwarded to the PETL Unified Account. The MOF will contribute funds to cover estimated annual sector payments into the PETL Unified Account, specifically the amounts required to meet PETL's payments obligations under the PPAs with approved IPPs.

26. **PETL Liquidity Support Account.** To enhance PETL's ability to attract private sector investment into its power sector, negotiate cost-effective PPAs, and mitigate nonpayment risk to the approved IPPs, a Liquidity Support Account will be established to backstop PETL's covered periodic PPA payments to approved IPPs. It is envisioned that PETL would also use the account to support public-use solar IPPs in the Gaza strip. In the event there is a shortfall in the PETL Unified Account caused by a failure of the MOF/line ministries to make timely payments through the Electricity Bills Payment System (or other pre-agreed reasons), PETL may draw upon the Liquidity Support Account to make covered payments under the approved PPAs. The account would be linked with specific IPPs (and subaccounts) that meet the pre-agreed prioritization criteria for approved PPA status. The Liquidity Support Account and Payment System will be designed, established, and managed by the MOF, PENRA, and PETL, for the benefit of approved PPAs, in a manner satisfactory to the World Bank. By providing tangible, identifiable payment support to the approved IPPs, the Liquidity Support Account will operate to mitigate the risk of nonpayment by PETL of certain periodic payment obligations under the PPAs with approved IPPs.

Figure 2.4. Operation of PETL Liquidity Support Account



27. **Approved IPPs.** Private sector investment into WB&G's electricity supply form a critical element of the cash flow identified under the PETL Unified Account, selling their entire power capacity and output to PETL under commercially negotiated, fair, and transparent PPAs. To attract private investment, PENRA and PETL will provide payment risk mitigation support, under the PETL Liquidity Support Account, to those investments that meet the criteria for approved IPPs (that is, IPPs competitively and transparently selected from private parties with a demonstrated ability to identify, assess, and manage project risks associated with the design, construction, operation, and/or ownership of power-generating assets).



PENRA, PETL, and the MOF will determine the methodology for selecting approved IPPs and provide oversight to ensure compliance with the conditions and criteria for approved IPP status.

28. **Initial funding and replenishment.** Initial funding for the PETL Liquidity Support Account of US\$20 million is provided through Phase 1. Once established, the account can be topped up with additional donor funds as needed. The account will be revolving in that it is replenished when funds are received from the MOF, as required under the Electricity Bills Payment System, and as a matter of priority under the PETL cash flow waterfall.

29. **Alternative use of funds.** In the event the PETL Liquidity Support Account cannot be disbursed due to failure to meet the conditions precedent within a specified period, monies will be repurposed, with the agreement of the PA, to support other productive purposes under the components of this operation, such as the financing mechanism for solar development in WB&G under component 3.

Challenges

- **Cash waterfall.** The PETL Unified Account waterfall payment prioritization schedule needs to be agreed and documented, including amounts required to meet PETL's payment obligations under the PPAs with approved IPPs. Given the current and growing risks associated with the high exposure of the banking sector to the public sector, the proposed scheme should safeguard against increased indirect exposure to participating banks (issuers of L/Cs), even with the availability of donor backing. To avoid additional risks to the stability of the financial sector, any additional exposure of the banking sector should be monitored by the Palestinian Monetary Authority as it currently does with direct and indirect borrowing.
- **Approved IPPs.** Under the PPAs with approved IPPs, PETL and the MOF will agree to be jointly and severally liable for PETL's off-taker performance. Payments to the approved IPPs will be prioritized in the cash flow waterfall based on meeting established criteria in respect of competitive procurement, tariffs, transparency, and sustainability. The terms and conditions for approved IPP status, including which payments will be covered, need to be established and notified to prospective investors; the benefits and obligations of approved IPP status will need to be documented in PPAs between PETL and the approved IPPs.
- **Effectiveness conditions, disbursement conditions, and conditions precedent.** The project will need to clearly identify several layers of conditions that must meet World Bank's satisfaction at each stage of the concept development, payment system design, and pilot implementation and operation.

Required Documents

- **Expanded PETL Unified Account Term Sheet.** It sets forth the terms and conditions under which PETL will collect and disburse account funds, as well as details of the cash flow waterfall.
- **MOF Electricity Bills Settlement Mechanism Agreement**—between the MOF, PENRA, and PETL—sets forth the terms and conditions under which MOF can make allocations to the



PETL Unified Account to cover electricity costs associated with governmental ministries and entities, refugee camps, and special cases and shortfall request made by PETL.

- **Liquidity Support Account and Payment System Agreement.** It sets forth the terms and conditions of the account, including how approved IPPs will make requests, in the event PETL fails to make timely payments under the relevant PPAs and the methodology by which the MOF will refund draws made against the account.
- **Approved IPP criteria and access to PETL Liquidity Support Agreements** between PETL and each approved IPP will set forth the criteria an IPP must meet before being considered 'approved' and thereby entitled to payment risk mitigation benefits under the PETL Liquidity Support Account. These documents will also need to define which PPA payments are covered by the account and set forth the procedures required for making requests, and drawdowns, against the account.
- **Liquidity Support Account and Payment System Operations Manual**, which will include detailed governance and institutional structure and financial and legal arrangements for each of the three parts: expanded PETL Unified Account, including a prioritized cash flow waterfall; the Electricity Bills Payment System; and the PETL Liquidity Support Account, including the terms and conditions of operation.
- **PA MOF, PENRA Undertaking/Policy Letter with World Bank.** It sets forth the government's undertakings to enact necessary legislation and specific acts required to ensure the power sector payment mechanisms operate in the manner intended for eliminating power sector cash flow shortfalls; improving PETL creditworthiness; and enhancing power sector transparency, accountability, and operation.

Pillar 4: Sector Reforms

30. PENRA's recent reform measures are showing success in terms of reduced technical losses, improved collection rates, and increased interest in small solar IPPs. The next stages of reforms are more complex and challenging as they require a more rigorous approach to enforcing financial discipline in the sector and increasing transparency and accountability across the supply chain. The PA has formed a high-level electricity sector reform committee to recommend reform measures. The MPA provides a longer-term vision that could create the platform for a broader dialogue to develop these recommendations and also strengthens the rationale of the PA and PENRA in implementing these reforms measures.

31. The reform measures fall into three broad categories: operational, governance, and financial reforms. The operational reforms require continuation of the ongoing efforts to improve revenue collection, reduce technical losses, and enhance cost recovery and financing for ongoing technical requirements of PETL and the DISCOs. The governance reform measures include strengthening the role of PERC in establishing criteria for approval of IPPs, reviewing the IPP licensing and wholesale tariff process, and expanding the regulator's role in ensuring uniform application of tariffs; establishing special tariffs targeting specific customer segments. In addition, as Pillar 3 activity related to the establishment and operation of PETL Liquidity Support Account and Payment System progresses, there will be need for documentation of key requirements in cabinet decisions, legislations, and high-level approvals. The financial reforms focus on improving payment discipline across the sector, which is crucial to ensure positive cash flow for PETL; improving transparency and accountability in the sector, and achieving the broader goal of eliminating electricity sector burden on the clearance revenue ('net-lending') mechanism.



Component 4: Technical Assistance, Capacity Building and Project Management

32. The activities under this component will be led by PENRA, which will actively engage the energy sector institutions, including PETL and DISCOs, in defining the potential pipeline and training needs. The technical assistance will enable PENRA to organize workshops, support feasibility studies, engage experts, and ensure adequate dialogue and knowledge sharing within the sector and in coordination with other line ministries. This component will reinforce monitoring, reporting, and evaluation capabilities of the energy sector institutions engaged with this project. Areas for which training and capacity-building support is to be provided will be defined after PENRA has discussed the requirements and opportunities with the relevant stakeholders. Such areas may include, but not be limited to, interconnection of solar PV installations including utility scale and small-scale solar with the grid or distribution network of utilities; battery recycling and disposal; environmental links and support for disposal and recycling of batteries; and metering of solar PV and renewable energy installations. The subcomponent will provide financing for the feasibility study of the 161 kV transmission link between Jenin and Nablus substations.

33. **Pilot improved battery recycling in Gaza.** The Gaza strip is estimated to have half a million batteries, of various types (primarily lead-acid and gel), in circulation. Given the excellent solar potential, the solar PV market is active in Gaza and continues to grow. As the Israeli border controls forbid the transport of batteries from Gaza to any external location (within Israel and abroad), management of this battery waste is an urgent environment and public health concern. The Gaza strip has approximately 15 small workshops that recycle batteries. However, they also face import restrictions and typically utilize basic processes, with no environmental quality or safety considerations. This causes severe and potentially life-threatening health risk for workers and the communities surrounding these workshops. Relatively, during 2012 to 2015, the Ministry of Health recorded 120 children of being poisoned with lead level in their blood of more than 45 µg/dl blood. Most of them were infected due to living near used lead-acid batteries recycling workshops. This activity will assist in developing best practices to support small-scale battery recycling, identifying the equipment required that would also be allowed under the import restriction regime, and supporting two to three small factories (workshops) to upgrade and retool their operations. In addition, the activity will enable knowledge exchange with the remaining workshops and identify options for supporting the remaining factories. The activity will handle as well as develop the battery waste collection through maximizing the collected waste batteries, minimizing the spent batteries disposal time to landfills, and enhancing the storage conditions. Regular stakeholder consultations will be undertaken to help define the approach to be taken toward recycling of battery wastes, disposal, and related activities. Besides, dissemination actions for environmental behavior change, capacity building on safety factors, and capitalization actions shall be performed under this component. Under capitalization, drafting of the follow-up plan for the sustainability of project results will be conducted in addition to design of the project road map for replicability of project results/multiplier effects. This component is targeted at not only averting the negative environmental impact of batteries, but it would also improve working conditions in the existing factories, incentivize them to adopt good business practices, and potentially create new job opportunities.

34. **Gender Analysis and Action Plan.** Table 2.1 provides a summary of the gender related opportunities identified in the project across all four components described above; specific actions that will be implemented and; the corresponding results indicators.



Table 2.1. Gender Analysis and Action Plan

Analysis	Actions	Indicator
<p>Female-Headed Households (FHHs) are especially vulnerable to energy poverty, leading to increased drudgery and negative implications on their human capital accumulation and safety. In Gaza, FHHs having a higher dependence on the grid-supplied power (64 percent compared to 52 percent among male-headed households). Therefore, electricity shortages are particularly distressing for FHHs in Gaza who have fewer assets and less opportunities for generating income. About 58 percent of FHHs compared to 41 percent of MHHs are in the bottom 40 percent as defined by the asset index (which takes into account nonmonetary measures of poverty). Additionally, only 10 percent of FHHs earn some kind of income compared to 58 percent of MHHs.</p>	<p>The project will continue building on ESPIP efforts and explore new financial packages that may include different repayment options as well as subsidized schemes for FHHs who represent 8 percent of households in Gaza and are among the most vulnerable, with 63 percent of them over 55 years old and widowed (74 percent). Details of the financial packages and subsidized scheme based on modified eligibility requirements will be included in the Operational Manual.</p> <p>To ensure the ability of vulnerable FHHs to benefit from the financing mechanism, the MPA will liaise with the social protection efforts, so that repayment of the solar PV systems will not prevent the sustainability of the mechanism.</p>	n.a.
<p>Unemployment is nearly three times as high among female graduates in engineering in Gaza as it is among male graduates (39 percent versus 16 percent, respectively). The ratio in West Bank is slightly lower with unemployment being twice as high among female engineering graduates compared to male graduates (43 percent versus 20 percent, respectively)</p> <p>This is not an issue of competence but of lack of networking opportunities that are crucial for securing the first job, typically as intern or apprentice. Anecdotal evidence indicates that male graduates are more successful in finding apprenticeships on their own and build their applied skills working in local factories or shops (through word of mouth, friends of families, face-to-face searches). This informal approach is restrictive as social norms and practice leave these venues out of reach for young women. This singular lack of ‘first-job’ opportunities results in weak curricula vitae. Furthermore, it limits the ability of these young graduates in improving their communications skills, which is a key requirement for applying/securing freelance work from regional and international organizations or companies.</p>	<p>In Gaza, the project will support the Gaza Women Engineers Network (GWEN^a) to provide a platform for relevant graduates to receive information on trainings and job opportunities in the field. The project will support GWEN in setting up for promoting employability through provision of certifiable trainings toward applied knowledge, communications skills, matchmaking with local companies or regional/international businesses for internship, apprenticeship, and freelance (for example, working on designs that could be done remotely) opportunities. Directly, the project will also encourage the following: (a) recruit female engineers interested in renewables to conduct businesses needs assessments and for operation and maintenance; (b) facilitate recruitment by local suppliers and improve visibility of potential female employees; and (c) encourage women-owned business (suppliers, investors, innovators, and service providers) and provide mentoring support as needed.</p> <p>The specific modalities of all these actions will be further fleshed out as part of the POM.</p>	Share of female engineers employed in the energy sector (7 percent); target 15 percent (according to data provided by PENRA and from survey of electricity companies)



Analysis	Actions	Indicator
<p>In the West Bank, the issue is often about employer preferences for hiring men over women because of the potential costs of having to offer maternity or childcare to female employees; perception of business disruption due to maternity leaves; and social norms limiting field work for women. For employed women, professional progress faces constraints in terms of traditional responsibilities at home, employer biases, and few tailored trainings in building female leadership^b. Such challenges are found across public and private employment in the energy sector. For example, female engineers only comprise 5 percent of all employees in PENRA^c and less than a fourth in majority of energy companies.^d</p>	<p>The POM for the PMU will include a budget allocation and procedure for recruitment of fixed-term contract staff to cover maternity leave for PMU staff. This is expected to demonstrate an alternative approach to managing the perception and reality of business disruption. The experience from the project will be disseminated to other public institutions and energy sector companies as a potential model. In addition, the project will include awareness-raising activities for employers on gender biases and why it matters to invest in women.</p>	<p>The baseline depends on the staffing data provided by PENRA</p> <p>Male staffing numbers to be confirmed</p>
<p>Additionally, lack of electricity negatively impacts female entrepreneurship, resulting in lost income for women-owned businesses and subsequent closures. About 42 percent of firms identified lack of electricity as a major constraint to business growth, with up to 16 outages lasting six hours each on average per month (Enterprise Survey, WB&G 2019). While this affects all businesses, women-owned businesses—majority of whom are micro or small and often home based—are particularly affected because of the nature of their work (cooking, handiwork, and textiles) relying on electrical appliances to produce their products (anecdotal evidence). Data also suggest that women are less likely to own generators or other forms of electrification for back-up during shortages largely because of costs.</p>	<p>The project will enable women-owned businesses access solar PV systems. This will be done first through an assessment that will capture the specific energy and financial needs of female-owned (and male-owned) businesses and help them determine which financial tools and solar kit options make most sense to address their different needs.</p> <p>With the help of GWEN, this subcomponent can also tap into the personal testimonies and stories of female engineers and renewables consumers to expand solar education, improve citizen engagement, and communicate benefits of clean solutions as part of the advocacy and public communications agenda.</p>	<p>Beneficiary women-owned businesses reporting increased income due to improved electricity services (percentage)—baseline 0 percent, target 25 percent.</p>

Note: a. ESIIP is supporting the establishment of GWEN to bring together female engineers in Gaza and promote equitable access to sustainable energy.

b. Hillis, Samira Ahmed, Jumana Jamal Subhi Alaref, and Wouter Matthijs Takkenberg. 2018. “Enhancing Job Opportunities for Skilled Women in the Palestinian Territories (English).” Washington, DC. Anecdotal evidence from field staff.

c. According to PENRA, 30 out of 74 staff members in the West Bank are female. A majority are in finance and administrative roles.

d. In a World Bank online survey carried out, 10 out of 11 business respondents reported to have between 0 and 25 percent of female staff in technical roles such as engineers and scientists.



ANNEX 3: Economic and Financial Analysis

COUNTRY: West Bank and Gaza

Advancing Sustainability in Performance, Infrastructure, and Reliability of the Energy Sector

1. The methodology of the economic and financial analysis involves identifying the problems being addressed by the different subcomponents of the project and quantifying the overall economic and financial value of the proposed investments. Subcomponents with similar outcomes will be bundled together into different 'parts' of this analysis even if they belong to different components. The project intends to address the following activities divided into four parts:

- **Part One - Network investments.** Reduce short-term supply constraints by improving T&D infrastructure to safely transfer electrons from existing solar PV installations to the areas experiencing supply shortages. This approach is relevant to Subcomponents 1.2, 1.3, 1.4, and 3.1.
- **Part Two - RPP.** Reduce technical and non-technical losses associated with high-value customers to increase DISCO revenue collection and reduce the cost of lost energy. This approach is relevant to Subcomponents 2.1 and 2.2.
- **Part Three - Solar rooftop program.** Reduce short-term supply constraints through solar rooftop installations. This approach is relevant to Subcomponent 3.2.
- **Part Four - Liquidity Support Account.** Reduce medium- to long-term supply constraints by competitively procuring solar PV plants to be built in the Palestinian Territories. This approach is relevant to Subcomponent 3.3

2. For Parts One and Three, DISCOs manage ongoing supply shortages through load shedding, thereby forcing their customers to seek expensive alternatives to meet their residential and commercial electricity needs. Short-term supply shortages are largely being met with small-scale diesel generation by the end consumers and in certain cases (for example, SELCO) by the DISCOs as well. Hence, the cost-benefit analysis will be focused on comparing the investment costs (of either network investments or solar rooftop systems) to the avoided costs of diesel generation.

3. For Part Two, the RPP will seek to install smart meters (which can be remotely monitored) at the locations of the customers that represent the largest revenue sources of their respective DISCOs. The RPP will reduce commercial (or non-technical) losses by reducing the proportion of electricity generation costs, which do not result in collected revenue for the DISCOs.

4. For Part Four, the ability to meet electricity demand in the medium to long term will focus on the expected value of the new competitively procured solar plants which will be supported by the Liquidity Support Account. Given the time horizon, the opportunity cost of the solar plants is additional power procured from IEC and hence the economic analysis will be conducted on this basis.

5. To calculate the NPV and EIRR, cash flows are used after removing the effect of applicable taxes and duties. A discount rate of 6 percent is used for the economic NPV. For all four parts of the economic analysis, GHG emissions will also be estimated and added to the economic value of the investment, where suitable.

Economic Analysis

Part One - Network investments

Table 3.1: Summary of network investments

Subcomponent	CAPEX (US\$, millions)	Additional Energy (GWh)
1.2	3.0	40
1.3	2.0	350
1.4	2.5	175
3.1	8.0	70
Total	15.5	675

6. The additional energy expected to be unconstrained by the proposed investments has been estimated by PENRA. The cost-benefit analysis is based on the difference between the 'proposed costs' and 'avoided costs'. The proposed costs of the investment include the CAPEX (funded by this project), the OPEX (benchmarked against actual costs observed in the West Bank DISCOs), and the cost of additional energy at the IEC price for high-voltage delivery. The avoided costs of the network investments are the capital (purchasing generators) and operating (fuel costs) expenditures involved in using diesel generation to provide an equivalent amount of energy to what has been proposed.

7. To establish the economic value of the network investments, the proposed costs (CAPEX, OPEX, and grid power) of the energy being accessed were compared to the avoided costs of diesel generation (CAPEX for captive generators and related fuel costs) and the annual savings were used to calculate the NPV.

8. For every year in the time horizon, the avoided costs of the diesel generation are greater than the expected costs of the network investments and the equivalent energy provided through the grid. The resulting NPV is US\$46.92 million. An EIRR calculation is not possible since all cash flows are positive.

9. Due to the offsetting of diesel power using solar, the level of GHG emissions that are avoided in this investment is 381,000 tCO₂e per year. The inclusion of GHG emissions in the economic analysis increases the NPV to US\$49.98 million.

Part Two - RPP

10. The RPP analysis builds on the methodology and experience of the RPP investments conducted under ESPIP. Smart meters will be installed for high-value commercial and industrial customers that represent the majority of electricity sales. The smart meters will enable increased revenues from these customers and also encourage more efficient electricity use resulting in energy savings. The net benefit of the RPP will be calculated based on the difference between the costs of the investment (CAPEX and OPEX) and the value of the recaptured non-technical losses (reduced generation). The analysis will also incorporate the benefits of avoided GHG emissions due to reduced generation.



Table 3.2. Summary for RPP

	West Bank (%)	Gaza (%)
Non-technical losses	8	13
Reduction attributed to project	3	3
Reduced generation resulting from reduced losses	40	40

11. Given the above assumptions, the results of the economic analysis provide an NPV of US\$60 million and an EIRR of 65 percent. The RPP appears to be economically viable with a high rate of return. Scenario analysis for NPV under different discount rates is provided in table 3.3. Initial avoided GHG emissions are 23,511 tCO₂e and this increases to 37,704 tCO₂e in the 20th year due to continued improvement in loss reduction.

Table 3.3. NPV with and without GHG

	6%	9%	12%
NPV without GHG (US\$, million)	60	43	31
NPV with GHG (US\$, million)	76	54	40

Part Three - Solar rooftop program

12. A financing mechanism has been created to fund rooftop solar PV systems for health institutions, MSMEs, and residential buildings. This fund will be scaled up to increase the number of systems that can be supported. The funding provided in Phase 1 of this project is assumed to be US\$7 million. Similar to the cost-benefit analysis of the network investments, the economic value of the rooftop installations is the difference between the 'proposed costs' of the installations and the 'avoided costs' of diesel self-generation. The approach will involve calculating the NPV for three types of individual installations and extrapolating the economic value of a combination of investments made using the funds available.

Table 3.4. Summary for solar rooftop system

	50 kWp	10 kWp	3 kWp
NPV (per system) (US\$)	414,228	82,846	24,858
EIRR (%)	143	143	143
Avoided GHG emissions (tCO ₂ e per year)	53	11	3
NPV (with GHG) (US\$)	443,774	88,755	26,631
EIRR (%)	159	159	159

13. The above results show that the economic value of replacing diesel self-generation is clearly justifiable at each different system size. The NPV of the entire subcomponent is US\$20,711,400 before including avoided GHG emission costs and US\$22,188,700. The impact of avoided GHG emissions from replacing diesel is also presented for each system size and it is observed that both NPV and EIRR are significantly enhanced.

*Part Four - Liquidity Support Account*

14. The Liquidity Support Account is being created to support the competitive procurement of new solar capacity during the pilot stage. PETL has indicated that the target price for this procurement is US\$0.09 per kWh. Given the risks of the operating environment, it is expected that private developers will expect payment guarantees of six months' worth of PPA payments. With an initial account of US\$20 million, it can support up to 205 MW of new solar capacity.

15. The approach for the economic analysis involves comparing the costs of the newly procured capacity (CAPEX and OPEX) to the counterfactual (or avoided costs) of increased supply from IEC. The result of this analysis is an NPV of US\$355,387,735 and an EIRR of 39 percent.

16. Annual GHG emissions that are avoided in this investment is 266,667 tCO₂e per year by replacing diesel with solar. The inclusion of GHG emissions in the economic analysis increases the NPV to US\$357,177,973 million.

Financial Analysis

17. The financial analysis uses a version of project cash flows, which does not exclude value added tax and custom duties. The NPVs are calculated with a range of discount rates to show possible scenarios.

18. **Part One - Network investments.** Similar to the economic analysis, the calculation of an internal rate of return (IRR) was not possible due to the lack of negative cash flows in the first year. NPV scenarios obtained are shown in table 3.5.

Table 3.5. Sensitivity Analysis for Network Investments

Discount rate	10%	12%	14%
NPV	35,599,275	29,712,320	25,496,780

19. **Part Two - RPP.** The IRR obtained is 55 percent and NPV scenarios are provided in table 3.6.

Table 3.6. Sensitivity Analysis for RPP

Discount rate	10%	12%	14%
NPV	37,147,176	30,077,426	24,599,732

20. **Part Three - Solar rooftop program.** The IRR obtained is 148 percent and NPV scenarios are provided in table 3.7.

**Table 3.7. Sensitivity Analysis for Solar Rooftop**

Discount Rate	10%	12%	14%
3 kWp	20,718	17,545	15,032
10 kWp	69,040	58,464	50,089
50 kWp	345,201	292,319	250,446
Subcomponent	17,260,050	14,615,950	12,522,300

21. **Part Four - Liquidity Support Account.** The IRR obtained is 40 percent and NPV scenarios are provided in table 3.8.

Table 3.8. Sensitivity Analysis for Liquidity support account

Discount rate	10%	12%	14%
NPV	267,948,538	215,865,146	174,895,343



ANNEX 4: Securing Energy for Development: Proposed Road Map

Phase 1: Improve sector creditworthiness	Phase 2: Advance parallel no regrets measures	Phase 3: Implement first wave of IPPs	Phase 4: Implement transformational projects
Substitute Israeli imports for diesel-fired generation in Gaza	Create infrastructure for import of natural gas	Convert GPP to CCGT gas-fired technology	Develop grid-scale solar PV/CSP farms in Area C
<p>P: Gradually ramp down GPP and use the savings to buy additional IEC supply until GPP can be converted to gas</p> <p>I: Provide additional power to Gaza through 161kV</p>	<p>P, I: Construct natural gas pipelines for West Bank and Gaza paving the way for construction of new/upgraded power plants</p>	<p>P: Complete conversion and upgrade of GPP ensuring flexible gas supply agreement to allow switch to Gaza Marine</p> <p>I: Enter into gas supply agreement for GPP</p>	<p>P: Begin development of renewables in Area C only after a successful track record of renewable development in Areas A and B</p> <p>I: Provide permits for construction in Area C</p>
Improve operational and commercial efficiency	Improve enabling environment for IPPs	Construct new CCGT plant at Jenin then Hebron	Develop transmission backbone in West Bank
<p>P: Continue improvement of DISCO performance by reducing losses, increasing collection rates and bringing down overhead costs. One mechanism can be through a Revenue Protection Program aiming to permanently measure and bill every KWh sold largest DISCO consumers</p>	<p>P: Update and improve legislation and licensing provisions that would help IPPs enter the market and also clarify roles and responsibilities of PERC and PETL in this environment</p>	<p>P: Complete JPP and HPP construction with flexible gas supply agreement to allow switch to Gaza Marine. Build additional substations to keep pace with increased domestic generation</p> <p>I: Enter into gas supply agreement for JPP and HPP</p>	<p>P: Begin development of a transmission backbone considering also the possibility of negotiating a swap mechanism which eliminates the need for wheeling or building of infrastructure</p> <p>I: Provide permits for construction in Area C and/or provide swap alternatives to building a backbone</p>
Securitize payments of wholesale electricity	Promote uptake of rooftop solar PV	Develop grid-scale solar PV farms in Areas A & B	Develop Gaza Marine Gas Field
<p>P: Strengthen sub-national public finance to avoid diversion of electricity bill collections to municipal budgets and set up escrow accounts both in Gaza and West Bank to ring fence collections</p>	<p>P: Set aggressive targets for 160MW of rooftop PV in Gaza and 530MW in West Bank</p>	<p>P: Increase renewable energy targets to 600MW in West Bank and 160MW in Gaza by 2030 (includes rooftop solar) but only after the right enabling environment has been established from Phase I</p>	<p>P: Develop Gaza Marine with least amount of infrastructure development to keep costs low</p> <p>I: Allow permission to use existing Israeli infrastructure for evacuation of Gaza Marine</p>
Adjust tariffs to better reflect cost recovery	Develop transmission backbone in Gaza	Establish wheeling arrangements with IEC	<p>P: Palestinian measures</p> <p>I: Israeli measures</p> <p>D: Donor community measures</p>
<p>P: Re-examine the retail tariffs and increase rates to allow better cost recovery by DISCOs</p>	<p>P: Upgrade T&D network to allow increase in power supply and reduction in losses</p>	<p>P, I: Negotiate lower wheeling tariffs and/or swap arrangements until a transmission backbone is built</p>	
Build the capacity of PETL to play its role	Design a risk mitigation mechanism for IPPs	Engage in dialogue over use of Area C	
<p>P: PETL to streamline billing to, and payments from DISCOs while in parallel pushing to energize the new substations and sign the PPA with IEC</p> <p>I: Sign bulk supply PPA and energize new substations</p>	<p>P, D: After creditworthiness issues from Phase I have been improved, develop financial risk mitigation instruments such as guarantee mechanisms</p>	<p>P, I: Coordinate on Area C access and permitting issues as well as grid stability and regional integration for supply expansion and transmission infrastructure</p>	