THE WORLD BANK

سلطة الطاقة والموارد الطبيعية

Palestinian Energy & Natural Resources Authority

Environmental and Social Management Plan

Electricity Sector Performance Improvement Project (ESPIP & AF)

ESMP Report

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October 26, 2020






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Abbreviations and Acronyms

AMI	Advanced Metering Infrastructure
BP	Bank Procedure
CO2	Carbon Dioxide
DB	Decibels
DISCO	Electricity Distribution Companies
EA	Environmental Assessment
EHS	Environmental Health And Safety
EPRI	Environmental Protection And Research Institute
EQA	Environment Quality Authority
ESMF	Environmental and Social Management Framework
ESMP	Environmental and Social Management Plan
ESPIP	Electricity Sector Performance Improvement Project
GEDCo	Gaza Electricity Distribution Company
GPP	Gaza Power Plant
HH	Household
HWMP	Hazardous Waste Management Plan
IEE	Initial Environmental Evaluation
ISO	International Organization For Standardization
kWh	Kilowatt Hour
kWp	Kilowatt Peak
MIS	Management Information Systems
NO	Nitrogen Oxide
OP	Operational Policy
OSHA	Occupational Safety and Health Administration
PAP	Project Affected People
PCBS	Palestinian Central Bureau Of Statistics
PEAP	Palestinian Environmental Assessment Policy
PEL	Palestinian Environmental Law
PENRA	Palestinian Energy and Natural Resources Authority
PERC	Palestinian Electricity Regulatory Council
PETL	Palestinian Electricity Transmission Company
PM	Particulate Matter
PMU	Project Management Unit
PPE	Personal Protective Equipment
PSI	Palestinian Standards Institution
PV	Photovoltaic
RPP	Revenue Protection Program
SME	Small And Medium Enterprises
TA	Technical Assistance
UNRWA	United Nations Relief and Works Agency
WB	World Bank Group
WHO	World Health Organization

Executive Summary

For the past decade, the Gaza Strip has been affected by chronic electricity shortages that has undermined the provision of basic services in different sectors and at all levels. The Electricity Sector Performance Improvement Project (ESPIP) is designed to improve the efficiency of the Palestinian electricity sector and energy security in Palestine by applying a set of measures along the energy supply chain. The project comprises four main components as follows:

- Component 1: Strengthening the Capacity of Palestinian Electricity Sector Institutions;
- Component 2: Improving the Operational Performance of Palestinian Electricity Distribution Companies (DISCOs);
- Component 3: Improving Energy Security in Gaza with Solar Energy (revolving fund component for HHs and SMEs & Grant component for Health sector);
- Component 4: Technical Assistance, Capacity Building and Project Management.

Under this project, the Gaza Solar Revolving Fund is financed as part of component 3. This Fund is a pilot aiming to install rooftop solar energy in Gaza for residential consumers, businesses and hospitals. The pilot model allows consumers to apply to the revolving fund for solar PV systems, with the cost repaid in monthly installments into the revolving fund. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops.

This Fund covers the installation of PV systems for number of households (2.5 to 5 kWp) and small and medium-sized enterprises (5 to 10 kWp) thereby creating a model that can be easily replicated and rapidly scaled up. The beneficiaries will pay back the capital costs in monthly installments. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops.

Under this assignment, the Consultant has prepared a full site-specific ESMP for fifteen sub-projects that are distributed along different locations in the Gaza Strip. The proposed system to be installed is rooftop. The main components of these installations include Photovoltaic modules, hybrid inverter, lead acid batteries, cables, protections and other accessories, and steel structure.

Policy and legal framework

The project is guided by the World Bank safeguard policies along with the local laws and regulations set by the Palestinian Authority. Therefore, the applicable policies, laws, and guidelines include:

- World Bank OP/BP 4.01 on Environmental Assessment: According to this policy, the project is classified as (category B) given that the potential adverse impacts are neither unprecedented nor are they as critical as those of (category A). I.e. the potential negative impacts on human populations and environment are site specific; and the mitigation measures are easily designed and implemented. For such projects, the policy requires an ESMP to be prepared.
- Palestinian Environmental Assessment Policy: In accordance with this policy, an Initial Environmental Evaluation (IEE) is required for projects where significant environmental impacts are uncertain, or where compliance with environmental

regulations must be ensured. The IEE study should include the predicted impacts and benefits of the project, and the proposed mitigation and environmental monitoring and management measures.

- The Palestinian Environmental Law (PEL) No. 7 of 1999
- WHO Ambient Air Quality Guidelines.
- WHO Noise Level Guidelines
- Palestinian Ambient Air Quality Standards
- Palestinian Noise Level Guidelines
- World Bank Environmental, Health and Safety General Guidelines

Baseline Conditions

Location: Taking into consideration the type of the proposed systems for the different households (rooftop), the on-site objects found in the PV installations' sites in these sites are mainly solar water heaters, water tanks, and satellite dishes. As the sub-projects sites are commonly surrounded by residential areas, no specific significant faunistic species or habitats were recorded.

Given that the sub-project sites are located in residential areas except for HH7, HH 12 and HH13 that are located in an agricultural area, the surroundings of the proposed sites for PV installations are mainly residential buildings and/or agricultural lands.

Energy Supply: The existing power supply options in the fifteen sub-projects sites include mainly an external supply from the Gaza Electricity Distribution Corporation (GEDCo) grid and from private diesel generators, where the household/enterprise pays about 4 NIS per one kw it consumes from these generators, while some of them depend on on-site generation from small PV solar systems or diesel generators with different capacities. Most of these houses also use UPS batteries to store energy to be used during power cuts to cover the operation of lights and/or some other devices that consume little power.

Public Consultation

In order to ensure the proper engagement of the identified Project Affected Persons (PAPs) and other relevant stakeholders, and given the current conditions due to the curfew imposed as a result of the outbreak of Covid-19 in the Gaza Strip, the consultation activities during the course of the study were limited to individual meetings.

The beneficiaries were approached at their households through individual meetings that took place between October 17 and October 22, taking into consideration social distancing. During these meetings, the sub-project components, locations and baseline conditions of the proposed sites were reviewed. The payment mechanism was also addressed as well as the environmental and social requirements, during which the proposed ESMP and some of the anticipated environmental and social risks and impacts were discussed. The interviewees were informed about the grievance redress mechanism that is available to address the complaints, opinions and suggestions related to the project (Leaflets showing this information were also provided to them).

Moreover, neighbors of the sites who are expected to experience nuisance from heat and light reflection from the installed PV systems during operation or from noise generated during the implementation of the system, were also approached through interviews. These meetings

have also discussed the existing GRM (Leaflets showing GRM channels were provided to them) that is meant to address the complaints, opinions and suggestions related to the project. All opinions and concerns raised during the individual meetings were incorporated and addressed within this report.

Grievance Redress Mechanism

A grievance redress mechanism has been established by PENRA for this project, and it is being used in coordination with GEDCo. The existing GRM follows clear procedures for receiving and handling complaints, which take place upon six stages, namely:

- the pre-complaint stage
- receiving the complaint
- studying and following-up the complaint
- closing the complaint and preparing reports
- unsettled complaints
- appeals process

For each of these stages, mechanisms to deal with different cases are illustrated, and a clear time frame is provided. The GRM has already been activated that people who have any project-related complaints can submit their complaints through different channels including phone calls, where the complaint officer at GEDCo receives and registers the complaint, as well as GEDCo website (http://eservices.gedco.ps/Complaint/), where the complainant can fill a complaint form.

Potential Environmental and Social Impacts

While there are substantial anticipated overall improvements for communities and the environment from the proposed sub-projects, some negative impacts have been identified. These have been classified into impacts during construction activities and impacts during the operational and maintenance phases.

The affected environmental and social parameters were identified based on the Environmental and Social Framework (ESMF) and the generic ESMP prepared for the project, the public consultations, and the experience of the consultant with similar projects. Then, the significance of the identified impacts was assessed taking into consideration different factors including nature, magnitude, geographical extent, timing, duration and reversibility of the impact.

Responding to the impacts identification and assessment, detailed site-specific mitigation measures were identified and evaluated in order to avoid, reduce or remedy the impacts associated with the project implementation during different phases.

The main negative impacts during the construction phase are those related to public and occupational health and safety. Workers are particularly susceptible to impacts from working from height, given that the PV installations in the sub-projects sites will be rooftop installations. On the other hand, given that the construction activities will take place in residential areas, public are also susceptible to safety risks during construction activities. Moreover, given the timeframe of the construction activities, which are proposed to take place during the current COVID-19 pandemic, special concerns regarding the risk of infection

were also addressed. However, all impacts during construction phase, have been assessed to be short-term impacts that can be minimized, if appropriate mitigation measures are applied, as required by and based on the recommendations in this report.

During the operation and maintenance phase, overall positive impacts with high significance are expected concerning energy and air and noise quality. The project will increase energy independence and security in case of conflict, longer hours of available power supply, and cleaner and cheaper alternative to private stand-by generators. The proposed systems are designed with sufficient capacities that will cover the basic energy needs of the households/enterprises.

On the other hand, the end-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently could be a source of risk to the environment and public and occupational health. However, this risk will be minimized through the proposed mitigation measures and Hazardous Waste Management Plan (HWMP) that should be followed through appropriate coordination with EQA to ensure safe storage, collection, transportation, recycling/reuse and disposal of these materials.

Environmental and Social Management Plan

The ESMP is designed to monitor the effectiveness of the identified mitigation actions, during and after construction. The ESMP provided in this report is generated based on the ESMF and the generic ESMP prepared for this project, and adjusted/updated, where required, based on the findings of the data collection and impact assessment processes for this assignment.

The ESMP provides the required mitigation measures, institutional responsibilities and recommended monitoring activities and their frequency. In general, the responsible party for implementation of mitigation measures during construction is the construction contractor (Contractor) while the Supervision Engineers from PENRA as well as EQA are responsible for monitoring. On the other hand, the main responsible party for the implementation of mitigation measures during system operations will be the project owners, while PENRA will be the main monitoring party, along with other relevant institutions, such as EQA for PV panels and storage batteries disposal. Detailed ESMP for different project phases is provided in Chapter 7 of this report.

1. Introduction

1.1. Background

For the past decade, the Gaza Strip has been affected by chronic electricity shortages that has undermined the provision of different services at all levels. Electricity in the Gaza Strip depends on three main sources namely, electricity imports from Israel, electricity production at Gaza Power Plant (GPP), and electricity imports from Egypt. Combined, these three sources cover less than 40 % of the daily electricity demand in the Gaza Strip, causing rolling power cuts from 12 to 18 hours daily (UN, 2017). As a result, many households in the Gaza Strip, as well as all other sectors including health, industrial and commercial sectors, have to rely on backup diesel generators to sustain critical services during grid electricity outage, which is also an unreliable option considering obstacles and restrictions regarding fuel availability.

The Electricity Sector Performance Improvement Project (ESPIP), developed in cooperation with the World Bank, is designed to improve the efficiency of the Palestinian electricity sector and energy security in Palestine by applying a set of measures along the energy supply chain. The project comprises four main components that focus on capacity building, operational performance improvement, and technical assistance activities, as well as the implementation of PV solar systems for residential customers, small and medium-sized enterprises (SMEs) and critical health facilities.

Under this project, the Gaza Solar Revolving Fund is financed. This Fund is a pilot aiming to install rooftop solar energy in Gaza for residential consumers, businesses and hospitals. The pilot model allows consumers to apply to the revolving fund for solar PV systems, with the cost repaid in monthly installments into the revolving fund. All payments will be made towards a revolving fund, which will be used to install more solar systems on additional rooftops.

This Fund covers Component 3 of the four components of the project, which includes the installation of PV systems for number of households (2.5 to 5 kWp) and small and medium-sized enterprises (5 to 10 kWp) thereby creating a model that can be easily replicated and rapidly scaled up.

The project is guided by the World Bank safeguard policies along with the Palestinian laws and regulations in the energy and environment sectors.

1.2. ESMP Scope and Objectives

The Palestinian Energy and Natural Resources Authority (PENRA) has prepared an Environmental and Social Framework (ESMF) and a generic ESMP for the project, while Dr. Fahid Rabah has been assigned to provide a detailed and site-specific ESMP for each sub-project. The main objective of the site-specific ESMP is to define the potential impacts of each sub-project and document the mitigation measures to prevent or minimize predicted negative impacts during project implementation and operation. Specifically, this ESMP is designed to ensure the following:

- Potential impacts during the implementation of project activities are identified;

- Detailed specific mitigation measures are developed and conducted during and after sub-project implementation;
- Responsibilities and institutional arrangement for the implementation of the mitigation measures are specified;
- Environment is fully integrated into the various activities of the proposed project, inclusion of environmental requirements into tender documents is ensured, and management and evaluation of the environmental performance of the project is continued;
- Mitigation measures are periodically assessed and tracked to ensure their effectiveness; and
- Implementation and monitoring schedules and reporting mechanism are provided.

This ESMP covers fifteen sub-projects that will be implemented in different locations in the Gaza Strip.

2. Project Description

2.1. Project overview

The key objective of ESPIP is to improve the efficiency of the Palestinian electricity sector and energy security in Palestine through a set of measures along the energy supply chain. In order to achieve this objective, the project comprises four main components as follows:

- **Component 1: Strengthening the Capacity of Palestinian Electricity Sector Institutions**. This component focuses on the sustainability and performance of the Palestinian Electricity Transmission Company Ltd (PETL) and the Palestinian Electricity Regulatory Council (PERC).

- **Component 2: Improving the Operational Performance of Palestinian Electricity Distribution Companies (DISCOs).** This component focuses on the sustained improvement of operational performance of the five DISCOs in the West Bank. It includes a "Revenue Protection Program" (RPP) with improved metering and billing systems. The RPP will reduce commercial losses by installing smart meters in high-end costumers and advanced metering infrastructure (AMI). In addition, the component will finance new or upgraded Management Information Systems (MIS) in selected DISCOs to further improve their commercial operations.

- **Component 3: Improving Energy Security in Gaza with Solar Energy (revolving fund component for HHs and SMEs & Grant component for Health sector).** This component aims to reduce the barrier to entry for all income levels, including the poor, thereby creating a model that can be easily replicated and rapidly scaled up. Due to limited funding, the pilot funded under this component will not significantly change Gaza's energy crisis on its own. However, in the long terms, the benefits of scaling up rooftop solar will include: i) increased energy security in case of conflict, ii) longer hours of available power supply, and iii) cleaner and cheaper alternative to stand-by generators.

- **Component 4: Technical Assistance, Capacity Building and Project Management.** This component will be used to strengthen the capacity of PENRA and support staffing the Project Management Unit (PMU) for two years. The PMU is located at PENRA's offices in Ramallah. The PMU staff will be integrated in PENRA's payroll after two years to ensure the Project's sustainability.

2.2. Sub-projects Components

The systems are rooftop and will be installed on the available space of the houses' roofs using fixed structures with optimum orientation at azimuth 0° – i.e. modules facing true south – and using the optimum tilt angle of 30°.

The main components of the proposed systems will be provided in the form of a kit that has a specific capacity, in general the kit includes: Photovoltaic modules (PV Generator), hybrid inverter, lead acid batteries, cables, protections and other accessories, and steel structure. The general layout and specifications of the proposed systems, including specifications of PV

generator, wiring diagrams, and specifications of equipment cabinet and battery are provided in Annex 1.

The PV kits are intended to be installed in residential (households) and commercial (Small and Medium Enterprises, SME) buildings. A total of 6 PV kits have been defined for this project as detailed in Table 2-1. For this package of sub-projects, ~~thirteen~~ twelve ~~-~~(12) K1 kits, one (1) K2 kit, one (1) K3 kit, and one (1) K4 kit, with the specifications shown in the table will be installed.

Table 2-1: Specifications of the PV kits defined for the project

Item	Unit	Households			SMEs		
		K1	K2	K3	K4	K5	K6
PV Capacity	kWp	2.5	3	5	5	7	10
Daily solar production	kWh/day	8.5	10.1	16.9	16.9	23.7	33.8
Inverter Rated capacity at 25°C	kW_{AC}	3,000	3,000	5,000	5,000	7,000	10,000
Battery (useful)	kWh/day	3.2	4.8	8	8	16.5	23.5
Battery (nominal)	kWh	6.4	10	16	16	31	47

Given the specified modules dimensions, capacities and tilt angle, eight PV modules are proposed to be installed for each household with K1 kit; 10 modules for households with K2 kit and 16 modules for sub-projects with K3 and K4 kits. For the K1 kit, the modules will be installed in single sheds where the area required for the shed is about 13 square meter; the modules will also be installed in single sheds for the K2 kit, where the area required for the shed is about 17 square meter, for the K3 and the K4 kits, however, the installation of the modules will be in two sheds, where the total area required for the system will be 27 to 31 meters, given that an inter-row spacing of at least 4 meters should be considered between the sheds that are placed in two different rows (More details are provided in Annex 1).

3. Applicable Environmental, Health, and Social Policies and Laws

Environmental legislation and regulations are vital tools to protect public health and the environment and give consideration to sustainable development. The project is guided by the World Bank safeguard policies along with the local laws and regulations set by the Palestinian Authority. Therefore, this chapter of the report discusses the related World Bank safeguard policies as well as the existing Palestinian legal and policy framework for the environmental sector.

3.1. World Bank OP/BP 4.01 on Environmental Assessment

Under the World Bank's operational policies, there are ten environmental and social policies referred to as the Bank's "safeguard policies". The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process.

The screening of applicable World Bank social and environmental safeguards policies indicated that, among these policies, OP/BP 4.01 on Environmental Assessment is triggered by this project. The overall objective of the OP/BP 4.01 is to help ensuring the environmental and social soundness and sustainability of investment projects. As per this policy, environmental assessment is required by the World Bank for projects proposed for WB financing to help ensure that they are environmentally sound and sustainable, and thus to improve decision making.

According to this policy, the WB undertakes environmental screening of each proposed project to determine the appropriate extent and type of EA. The WB classifies the proposed project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts. Based on the screening of this project, the project is classified as category B given that the potential adverse impacts are neither unprecedented nor are they as critical as those of Category A. I.e. the potential negative impacts on human populations and environment are site specific; and the mitigation measures are easily designed and implemented. For such projects, the policy requires an ESMP to be prepared.

3.2. Palestinian Environmental Assessment Policy

The Palestinian Environmental Assessment Policy (PEAP) was approved by decree No: 27-23/4/2000. The PEAP supports the sustainable economic and social development of the Palestinian people. Specifically, the PEAP promulgates the following:

- Ensure an adequate quality of life in all aspects, and ensure that the basic needs and social, cultural, and historical values of the people are not negatively impacted as a result of development activities.
- Preserve the capacity of the natural environment.
- Conserve biodiversity and landscape, and promote the sustainable use of natural resources.
- Avoid irreversible environmental damage, and minimize reversible environmental damage from development activities.

Under the PEAP, proponents of public and private projects are required to submit an Application for Environmental Approval that informs the EQA and relevant approving

authorities of the intended project activities. Subsequently, a determination is made whether an Initial Environmental Evaluation (IEE) or a detailed EA is required. If neither an IEE nor EA report is required, the EQA, in coordination with the EA Committee, will determine if an Environmental Approval will be granted and, if so, under what conditions. An IEE is required for projects where significant environmental impacts are uncertain, or where compliance with environmental regulations must be ensured

In accordance with this policy, an IEE study should include the predicted impacts and benefits of the project, and the proposed mitigation and environmental monitoring and management measures.

3.3. Palestinian Environmental Law

The Palestinian Environmental Law (PEL) No. 7 of 1999 was developed by the Environment Quality Authority (EQA), to protect environmental resources, including land environment; air environment; water resources and aquatic environment; and natural, archaeological and historical heritage. According to the PEL, the protection of these resources shall be addressed in all social and economic development plans in view of sustainable development and protection of the rights of future generations.

The core issues of concern in the PEL are the protection of public health and social welfare, as well as the conservation of ecologically sensitive areas, biodiversity and rehabilitation of environmentally damaged areas. The PEL also sets penalties for violating any article presented under this law. The main objectives of the PEL include the following:

- Protecting the environment from pollution.
- Protecting public health and social welfare.
- Incorporating environmental resources protection in all social and economic development plans and promoting sustainable development to protect the rights of future generations.
- Conserving ecologically sensitive areas, protecting biodiversity, and rehabilitating environmentally damaged areas.
- Establishing inter-ministerial cooperation.
- Promoting environmental information collection and publication.
- Promoting public awareness, education and training.

Article 8 of this law reads, "*The competent authorities, consistent with their respective specialization, shall encourage undertaking appropriate measures to reduce the generations of solid waste or any other hazardous waste to the lowest level possible, and to the best extent possible, shall encourage solid waste treatment, recycling or processing*".

Articles 12 and 13 of the PEL provide for the disposal of hazardous materials, such as solar panels and storage batteries, only under the umbrella of the Environmental Quality Authority (EQA) approval, in coordination with the specialized agencies. Furthermore, a special license is required from EQA to import hazardous materials, such as could be contained in solar panels and batteries. Article 45 empowers the EQA to set standards for environmental impact assessment studies and to prepare the relevant rules and procedures for such studies.

In accordance to Article 49, the PEL further requires EQA to cooperate with the competent authorities to follow up on the implementation of decisions that are issued concerning the environmental impact. EQA is also required, according to Article 50, to monitor compliance with approved specifications, standards and instructions for the protection of environment and vital resources. The law further empowers EQA inspectors and other appointed inspectors to record the environmental violations and crimes that may take place and violate this law, as per Article 51. EQA inspectors shall also have, in cooperation with the competent departments and authorities, right of entry into the installations for the purpose of: inspecting them, taking samples, carrying out measurements, and ascertaining the application of the standards and conditions of the environment protection and prevention of pollution, according to Article 52.

The EQA is also empowered, as per Article 57, to stop, for a period not exceeding two weeks, any project works that could constitute a serious hazard to the environment. The stoppage can only be extended by a judicial order from the competent court.

3.4. WHO Ambient Air Guidelines

The WHO Air Quality Guidelines (2005) are recommended by the WB Environmental, Health and Safety Guidelines to be applied in the absence of national legislated standards, in order to prevent or minimize significant to ambient air, by ensuring that emissions do not result in pollutant concentrations that reach or exceed these guidelines and standards. Interim targets are provided in recognition of the need for a staged approach to achieving the recommended guidelines. Table 3-1 sets a comparison between the WHO and Palestinian ambient air quality standards.

Table 3-1: WHO and Palestinian Ambient Air Quality Guidelines

Parameter	Averaging Period	WHO Guideline value* ($\mu g/m^3$)	Palestinian Guideline value ($\mu g/m^3$)
PM_{10}	24-hour	150 (Interim target-1) 100 (Interim target-2) 75 (Interim target-3) 50 (guideline)	150
	1-year	70 (Interim target-1) 50 (Interim target-2) 30 (Interim target-3) 20 (guideline)	70
NO_2	1-hour	200 (guideline)	400
	24-hour	--	200
	1-year	40 (guideline)	100
O3	1-hour	--	200
	8-hour	160 (Interim target-1) 100 (guideline)	120
SO_2	1-hour	--	350
	24-hour	125 (Interim target-1) 50 (Interim target-2) 20 (guideline)	250

Parameter	Averaging Period	WHO Guideline value* ($\mu g/m^3$)	Palestinian Guideline value ($\mu g/m^3$)
	1-year	--	60
	10-minute	500 (guideline)	--

* PM 24-hour value is the 99th percentile.

3.5. Palestinian Ambient Air Quality Standards

The Palestinian Ambient Air Quality Standards (PS 801- 2010) were developed by the Palestinian Standards Institution (PSI) through the Environment Committee. The result is health based standards and objectives for a number of pollutants in air, including particulate matter, nitrogen oxides, ozone and sulfur oxides as shown in Table 3-1 for the comparison between the Palestinian and the WHO ambient air standards.

3.6. WHO Noise Level Guidelines

Guidelines for Community Noise, World Health Organization (WHO), 1999, provided guidelines values for noise levels measured out of doors. These levels, presented in Table 3-2, should not be exceeded by any noise source.

Table 3-2: WHO Outdoor Noise Level Guidelines

Receptor	One Hour LAeq (dBA)	
	Daytime (07 am – 10 pm)	Nighttime (07 am – 10 pm)
Residential, institutional, educational	55	45
Industrial, Commercial	70	70

3.7. Palestinian Noise Level Guidelines

The Palestinian Standards Institution have established the Outdoor Noise Standards (PS 840-2005), through the Environment Committee, to Provide information for the protection of public health against the outdoor noise level. These guidelines are shown in Table 3-3. The Palestinian and the WHO guidelines have almost the same levels, with the Palestinian guidelines having more detailed types of receptors.

Table 3-3: Palestinian Outdoor Noise Level Guidelines

Receptor	One Hour LAeq (dBA)	
	Daytime (07 am – 08 pm)	Nighttime (07 am – 08 pm)
Rural residential areas, hospitals, schools	40	30
Residential	50	40
Residential with some commercial activities, or along main roads	55	45
Commercial	65	60
Industrial	75	65

3.8. World Bank Environmental, Health and Safety General Guidelines

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents which are applied when one or more members of the World Bank Group are involved in a

project. These Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs.

The General EHS Guidelines are designed to be used together with the relevant Industry Sector EHS Guidelines, which provide guidance to users on environmental, community health and safety and occupational health and safety issues in specific industry sectors. These guidelines were used during the identification of mitigation measures and monitoring activities

4. Baseline Conditions

This chapter presents and identifies relevant site-specific baseline data on the characteristics of the sites for different sub-projects based on the field visits conducted by the consultant, the interviews with stakeholders and the review of relevant documents. It provides baseline information for each site on the locations and land use, biological resources, air quality and noise levels, current energy sources, and historical and cultural heritage. It also provides general information regarding employment and livelihood in the Gaza Strip.

4.1. Location of the Sub-Projects Sites

The Gaza Strip is a narrow area of land bordering the eastern coast of the Mediterranean Sea located in the south-west area of Palestine. The Gaza Strip is about 42 km long and between 6 to 13 km wide, and its total area is 365 km^2. The project sites are distributed across different areas in the Gaza Strip as follows:

- Seven sites in Gaza Governorate (HH1, HH2, HH3, HH4, HH5, HH6 and SME1),
- Four sites in the Northern Governorate (HH7, HH8, HH9 and HH10),
- Two sites in the Middle Governorate (HH11 and HH12), and
- Two site in Khanyounis Governorate (HH13 and HH14).

The exact location and coordinates for each site are illustrated in Table 4-1.

Table 4-1: Location of the sub-project sites

Site	Exact Location	Coordinates (Palestinian Grid 1923)	
		X	Y
HH1	Gaza City-Tel El Hawa neighborhood	96191.58	101669
HH2	Gaza City-Al Rasheed Street	95331.23	102509
HH3	Gaza City-Tel El Hawa neighborhood	96380.31	102190.3
HH4	Gaza City-Al Nasr Street	97744.98	103915.7
HH5	Gaza City-Al Sabra neighborhood	97000.63	102034.1
HH6	Gaza City-Al Tuffah neighborhood	100850.3	102088.9
HH7	Beit Lahia-Salateen neighborhood	101163.9	107007.7
HH8	Beit Lahia-Al Twam neighborhood	99841.54	106171.1
HH9	Beit Lahia- Sudaneya neighborhood	99721.98	107561.6
HH10	Jabalia-Beir Al Na'ja Area	101294.1	105715.9
HH11	Al Mughraqa	94314	96542.8

Table 4-1: Location of the sub-project sites

Site	Exact Location	Coordinates (Palestinian Grid 1923)	
		X	Y
HH12	Deir Al Balah-North to Abu Miri crossing	90577.8	90708.6
HH13	Khanyounis-Gizan Al Najar Area	82871.7	81536.7
HH14	Bani Suhaila-Al Fajm Street	85673.5	84129.4
SME1	Gaza City-Sheja'ya neighborhood	99968.51	100992.6

As discussed earlier in Chapter 2, the PV will be rooftop installations. The main information regarding the available area, on-site utilities and services, electrical safety concerns, and surroundings of each of the fifteen sites is discussed in the following sections.

4.1.1. Location of HH1

The site of HH1 is located in Tel Al Hawa neighborhood in Gaza City, which is considered a main residential area (See Figure 4-1 for the site location map). Therefore, the surroundings of the proposed site for PV installations are mainly residential buildings with some commercial activities.

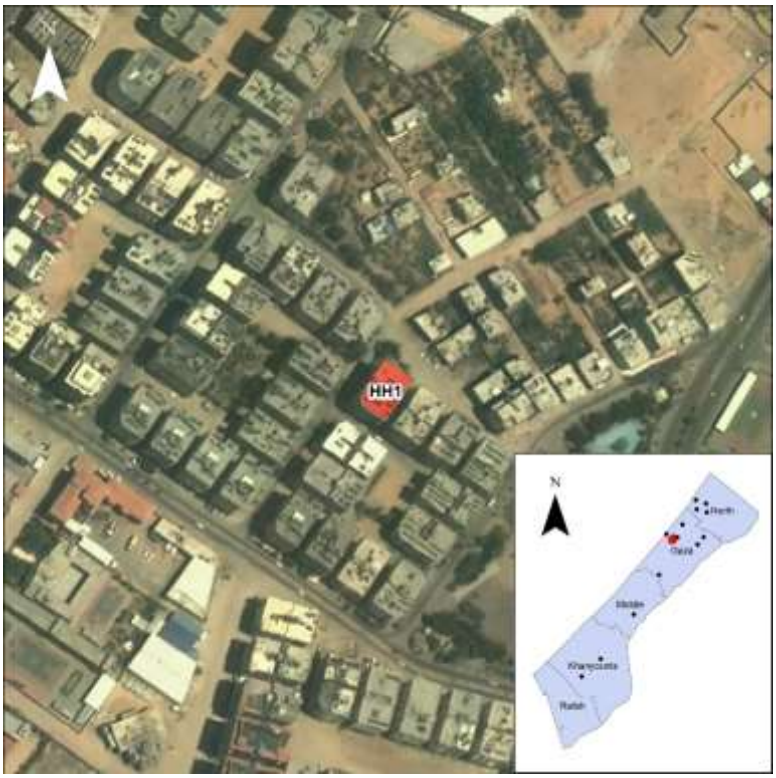

Figure 4-1: HH1 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of a rooftop room; site visits confirmed that the proposed site is stable and can be easily & safely assess. accessed through a fixed safe ladder.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH1 are a small scale PV system and two small satellite dishes. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is a roof of a shared building, thus the project beneficiary has obtained a written approval from the Residents Association, on behalf of the residents, who are the owners of the building, to install the PV system in the specified location (See Annex 3 for a copy of this approval).

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.2. Location of HH2

The site of HH2 is located along Al Rasheed Street in Gaza city, about 150 m from the sea, which is mainly a mixed residential recreational area (See Figure 4-2 for the site location map). Therefore, the surroundings of the proposed site for PV installations are a main public road followed by the sea to the west, residential buildings to the north, empty land followed by residential buildings to the south, and residential buildings to the east.

Figure 4-2: HH2 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the proposed PV installations' site at HH2. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is a roof of a shared building, thus the project beneficiary has obtained a written approval from the Residents Association, on behalf of the residents, who are the owners of the building, to install the PV system in the specified location (See Annex 3 for a copy of this approval).

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.3. Location of HH3

The site of HH3 is located in a residential area in Tel Al Hawa neighborhood in Gaza City (See Figure 4-3 for the site location map). Therefore, the surroundings of the proposed site for PV installations are a residential building to the east, residential buildings to the north, a wide paved road to the south, and residential buildings to the west.

Figure 4-3: HH3 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No major on-site services and utilities are found in the PV installations' site at HH3. The system will be installed on an empty area in the south western part of the roof that no utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.4. Location of HH4

The site of HH4 is located in a residential area along Al Nasr Street Gaza City (See Figure 4-4 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the east and north and paved roads followed by residential buildings to the west and south.

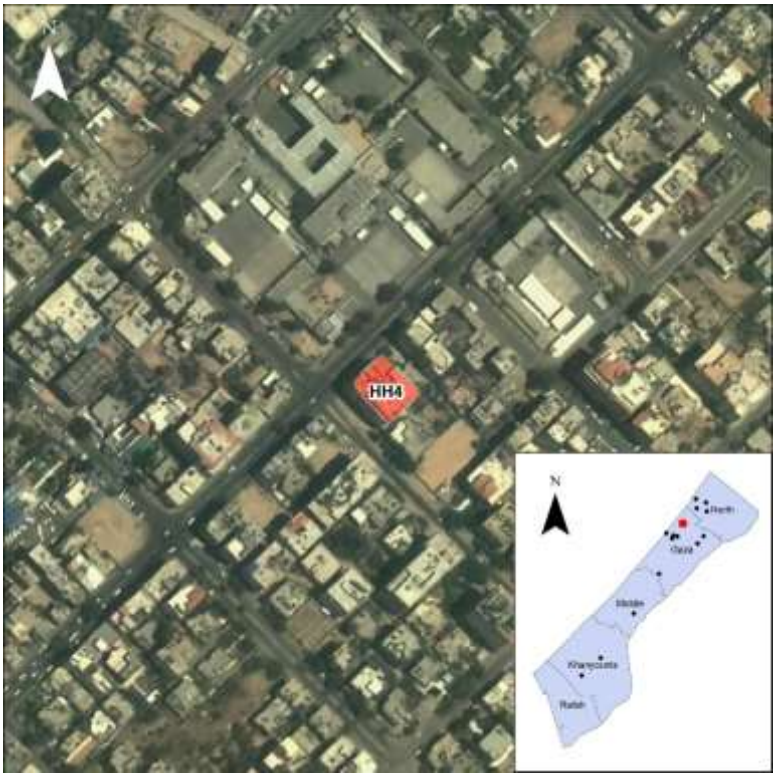

Figure 4-4: HH4 Site Location Map

Access road: The site access road is a paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area at the roof of the building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH4. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.5. Location of HH5

The site of HH5 is located in Al Sabra neighborhood in Gaza City, which is a residential area (See Figure 4-5 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the east, west and north, and an empty land to the south.

Figure 4-5: HH5 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the building; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH5. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site and the surrounding area do not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.6. Location of HH6

The site of HH6 is located in a residential area in Al Tuffah neighborhood Gaza City (See Figure 4-6 for the site location map). Therefore, the site is surrounded by residential buildings from all directions.

Figure 4-6: HH6 Site Location Map

Access road: The site access road is an unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH6. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.7. Location of HH7

The site of HH7 is located in Al Salateen Area in Beit Lahia, which is characterized by having open agricultural lands with small number of buildings (See Figure 4-7 for the site location map). Therefore, the site is surrounded by agricultural lands, a mosque to the east and one residential building to the north far from the site.

Figure 4-7: HH7 Site Location Map

Access road: The site access road is a wide unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH7 except for some plants in movable containers and a fabric cover that is installed to provide shade and privacy. The cover and the plants need to be relocated to allow for a shade-free area on the roof; ~~T~~the available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.8. Location of HH8

The site of HH8 is located in a residential area with medium density in Al Twam area in Beit Lahia City (See Figure 4-8 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the west and to the south and empty lands to the east and to the north.

Figure 4-8: HH8 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH8 are a small scale PV system and two water tanks. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.9. Location of HH9

The site of HH9 is located in a residential area with medium density in Al Sudaneya area in Beit Lahia City (See Figure 4-9 for the site location map). Therefore, the surroundings of the proposed site for PV installations are empty lands and some scattered residential buildings.

Figure 4-9: HH9 Site Location Map

Access road: The site access road is a wide unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH9 are water tanks and a solar water heater. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.10. Location of HH10

The site of HH10 is located in a residential area in Beir Al Na'ja area in Jabalia City (See Figure 4-10 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings from all directions.

Figure 4-10: HH10 Site Location Map

Access road: The site access road is an unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH10. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.11. Location of HH11

The site of HH11 is located in a residential area with low density in Al Mughraqa town in the Middle Governorate (See Figure 4-11 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings and some agricultural lands.

Figure 4-11: HH11 Site Location Map

Access road: The site access road is a wide unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of a rooftop room; site visits confirmed that the proposed site is stable and can be easily & safely assessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH11 are water tanks. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.12. Location of HH12

The site of HH12 is located in an agricultural area in Deir Al Balah City (See Figure 4-12 for the site location map). Therefore, the surroundings of the proposed site for PV installations are agricultural lands from all directions.

Figure 4-12: HH12 Site Location Map

Access road: The site access road is an unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH12 are a solar water heater and water tanks. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.13. Location of HH13

The site of HH13 is located in an agricultural area in Gizan Al Najar area in Khanyounis City (See Figure 4-13 for the site location map). Therefore, the surroundings of the proposed site for PV installations are agricultural lands and some scattered residential buildings that are located far from the site.

Figure 4-13: HH13 Site Location Map

Access road: The site access road is a wide unpaved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at HH13 are water tanks. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.14. Location of HH14

The site of HH14 is located in a residential area in Al Fajim Street in Bani Suhaila town (See Figure 4-14 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the west and to the south and empty lands to the east and to the north.

Figure 4-14: HH14 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the house; site visits showed that the proposed site is stable and can be easily and safely accessed.

On-site services and utilities: No services and/or utilities are found in the PV installations' site at HH14. The available area at the proposed roof is enough comparing to the required area for the installation of the system. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.1.15. Location of SME1

This small enterprise (SME1), which is a petrol filling station, is located in a residential area in Al Shejaeya neighborhood in Gaza City (See Figure 4-15 for the site location map). Therefore, the surroundings of the proposed site for PV installations are residential buildings to the west and to the north, an unpaved road followed by residential buildings to the east and a graveyard and a main road to the south.

Figure 4-15: SME1 Site Location Map

Access road: The site access road is a wide paved road.

Roof stability and accessibility: The PV installations will be placed in a shade-free area on the roof of the administration building; site visits showed that the proposed site is stable and can be easily and safely accessed. On the other hand, a steel roof is adjacent to the western border of the site; this roof should not be accessed by the workers during installation works.

On-site services and utilities: The on-site services and utilities found in the PV installations' site at SME1 are two water tanks and two small satellite dishes. The available area at the proposed roof is enough comparing to the required area for the installation of the system that none of these utilities/services will be relocated or removed. Photos for the site are shown in Annex 2.

Shared amenities: The site is owned by the registered project beneficiary, thus no shared are found within the site.

Electrical safety concerns: The site does not include any uncovered or unprotected cable or connections (aerial, on rooftop or in the house).

4.2. Biological Resources

In spite of its very small area and crowded population, the Gaza Strip has interesting biodiversity elements in terms of species, habitats and ecosystems (Abd Rabou, 2009). Vertebrate wildlife species, including wild mammals, birds, reptiles and amphibians, are common in the Gaza Strip. The project sites are located commonly surrounded by residential areas that have no specific significant faunistic species or habitats.

Moreover, according to the conducted site visits and the reviewed literature, which includes scientific publications and reports, it was confirmed that no specific significant floristic species are witnessed in the sub-project areas, other than some regular common species such as shrubs and herbaceous plants that can be found in surrounding areas.

4.3. Air Quality and Noise level

Available data on ambient air quality in Gaza are very limited. Some site specific monitoring campaigns were carried out during the past five years. The only integrated study that covers different areas in the Gaza Strip was carried out in 2005 by the Environmental Protection and Research Institute. The pollutants of concern included sulfur dioxide (SO2), nitrogen oxides (NOx), and Lead (Pb) (EPRI, 2006).

According to this study (EPRI, 2006); the average annual SO_2 concentration, in Gaza, North Gaza, Middle Area, and Khanyounis governorates, is about 180, 70, 100, and 60 µg/m^3, respectively. While the average annual NOx concentration is about 42, 19, 27, and 17 µg/m^3 in Gaza, North Gaza, Middle Area, and Khanyounis governorates, respectively. Moreover, the average annual lead concentration according to the same study is about 0.15 µg/m^3.

Another study conducted in 2016 (Al Madhoun et al., 2016) revealed that the mean CO2 concentrations at different locations in the Gaza Strip, which included main crowded streets as well as minor streets, range between 341-518 ppm, which is very close to or higher than the agreeable international level of CO2 (350 ppm).

With regards to noise levels, all of the fifteen sub-projects sites are located in urban areas, with medium to high traffic activities identified in the vicinity of the sites. A recent study (Al Madhoun et al., 2013), measured the traffic noise level at various development sites of different traffic volumes in Gaza City (urban, rural and camps). The results obtained show that the average noise level during weekdays in the urban areas ranged from 69.57 dB to 87.88 dB.

4.4. Energy

As mentioned earlier in Chapter 1 of this report, rolling power cuts in the Gaza Strip, which occur from 12 to 18 hours daily, have led to a very unpredictable and discontinuous supply. Accordingly, the current power supply in the households targeted in this pilot has been designed to cope with the constraints of the power supply in Gaza.

The existing power supply options in the fifteen sub-projects sites include mainly an external supply from the Gaza Electricity Distribution Corporation (GEDCo) grid and from private diesel generators, where they pay about 4 NIS per one kw they consume from these generators, and on-site generation from diesel generators with different capacities. Some of these houses also use UPS batteries to store energy to be used during power cuts to cover the operation of lights and/or some other devices that consume little power.

4.5. Employment and Livelihood

Unemployment in the Gaza strip has been persistently high. According to percentage distribution of labor force participants, the general unemployment rate was 48.2% among labor force participants. The working youth in the Gaza Strip engages is somewhat different

economic activities. Most employed young persons in the Gaza Strip work in trading, followed by services and industry (PCBS, 2018).

Temporary employment is dominant in the Gaza Strip. Many jobs are characterized by daily wages and short-term contracts. In 2018, the average daily wage recorded for wage employees in the Gaza Strip was 62.6 NIS. Although this might be a relatively higher rate compared to other developing countries, it is still too low to allow families to meet daily basic needs, given relatively high prices for basic commodities as a result of blockade and several economic restrictions. The poverty rate is considered to be growing amongst Palestinians in the Gaza Strip that the poverty rate in Gaza reached 53.6% by 2017, while the deep poverty rate reached 33.8%.

In addition, the public sector employees in the Gaza Strip are sometimes facing severe financial situations due to delay or non-payment of salaries as a result of the instability of the political situation.

4.6. Historical and Cultural Heritage

The archaeological sites and historical buildings in the Gaza Strip vary between monuments, mosaic sites, mosques, churches and others. Based on desk study review and observations from the conducted site visits, it is confirmed that no traces of archaeological and cultural heritage have been found at the proposed project sites.

5. Public Consultation and Grievance Redress Mechanism

The following sections will discuss the stakeholders' identification, engagement and consultation, including the main concerns that were raised during the different consultation activities. The sections also discuss the grievance redress mechanism for this project.

5.1. Public Consultation

As part of the ESMP, many activities were carried out to ensure the adequate engagement of stakeholders. The first step of this process was the identification of project Stakeholders. Stakeholders may include locally affected community groups or individuals and their formal and informal representatives, national or local public authorities, civil society and community-based organizations and groups with special interests. Then, the identified stakeholders were approached and engaged as discussed hereafter.

Stakeholders Identification

In order to capture stakeholders, who are directly or indirectly affected by the project (project-affected people) along with other relevant stakeholders, two approaches were adopted as follows:

- Identification of stakeholders based on geographical location: these include the neighbors of the sub-projects sites who might be affected by the project during different phases.
- Identification of stakeholders based on their interest and influence: these include the project beneficiaries (14 households and one small enterprise), as well as national public institutions concerned with the project, e.g. PENRA and GEDCo.

Stakeholders Engagement and Consultation

In order to ensure the proper engagement of the identified Project Affected Persons (PAPs) and other relevant stakeholders, and given the current conditions due to the curfew imposed as a result of the outbreak of Covid-19 in the Gaza Strip, the consultation activities during the course of the study were limited to individual meetings.

The beneficiaries were approached at their households through individual meetings that took place between October 17 and October 22, taking into consideration social distancing. During these meetings, the sub-project components, locations and baseline conditions of the proposed sites were reviewed. The payment mechanism was also addressed as well as the environmental and social requirements, during which the proposed ESMP and some of the anticipated environmental and social risks and impacts were discussed. The interviewees were informed about the grievance redress mechanism that is available to address the complaints, opinions and suggestions related to the project (Leaflets showing this information were also provided to them). The general opinions and concerns from the interviewed personnel were incorporated and addressed within this report. The feedback, comments, and concerns of each interviewee are summarized in Table 5-1.

Moreover, neighbors of the sites who are expected to experience nuisance from heat and light reflection from the installed PV systems during operation or from noise generated during the implementation of the system, were also approached through interviews. These meetings have also discussed the existing GRM (Leaflets showing GRM channels were provided to them) that is meant to address the complaints, opinions and suggestions related to the project (See Table 5-1). Photos during different meetings are attached in Annex 4.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Project beneficiaries					
Awad Abdelhadi- Owner of HH1	HH1	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with rolling power cuts that can reach 12 hours per day. A UPS battery is used to store energy to be used during power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof needs to be relocated or removed. - As the owner of HH1 lives in a shared multi-story building he has obtained a written approval from the Residents Association, on behalf of the residents, who are the owners of the building, to install the system on the roof of the building (See Annex 3)
Salam Hamouda- owner of HH2	HH2	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with rolling power cuts that can reach 12 hours per day. A UPS battery is used to store energy to be used during power cuts for lights and devices that consume little power. - The household is very close to the sea and thus, special concern should be given to the durability of the system components especially in terms of corrosion resistance, given the high levels of salinity and humidity of the seaside.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
					- The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof needs to be relocated or removed. - As the owner of HH2 lives in a shared multi-story building he has obtained a written approval from the Residents Association, on behalf of the residents, who are the owners of the building, to install the system on the roof of the building (See Annex 3)
Mohammed Al Bora'i-owner of HH3	HH3	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with rolling cuts of at least 12 hours/day, as well as electricity from an external private diesel generator for about 4 NIS/kw. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include satellite dishes and water tanks, needs to be relocated or removed.
Sami Abu Kmail-owner of HH4	HH4	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day, as well as electricity from an external private diesel generator that is operated for limited number of hours during power cuts, for which the household may pay about 300-400 NIS per month. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				utilities, and biological resources. - Available GRM for the project	- No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.
Ramadan Ayesh-owner of HH5	HH5	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The available sources of energy include, along with the electricity from the grid, an external private diesel generator that provides the household with electricity during power cuts for about 4 NIS/kw. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.
Nabeeh Bassam Kuhail-owner of HH6	HH6	Gaza	October 18, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The available sources of energy include, along with the electricity from the grid, an external private diesel generator that provides the household with electricity during power cuts for about 4 NIS/kw. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Ayoub AlAttar- owner of HH7	HH7	Beit Lahia	October 18, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends only on electricity from the public grid (GEDCo) with rolling cuts of about 12 hours/day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - The site is located in an agricultural area, where seasonal crops are mainly cultivated, that no neighbors or trees are found to be affected during different project phases. - The customer was concerned about the installment of his monthly payments in case of salaries' payments delay, yet he was informed about the specific procedures PENRA will adopt to deal with such cases; PENRA will coordinate with the bank to postpone accumulative monthly payments once salaries installed in the customer account; the postponed payments will be paid as a once. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof. Only some small plants are found in movable containers that they can be easily relocated. A fabric cover that is installed to provide shade and privacy is also found; this cover should be removed to provide a shade-free area for the PV installations.
Ghassan Ayman Ftaiha- Owner of HH8	HH8	Beit Lahia	October 20, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household.	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The available sources of energy include, along with the electricity from the grid, a small scale PV solar system. - No biological resources are found to be affected by the project activities.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include a small scale PV system and water tanks, needs to be relocated or removed.
Amjad Shaqoura- owner of HH9	HH9	Beit Lahia	October 20, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include a solar water heater, needs to be relocated or removed.
Mahmoud Shaqoura- Owner of HH10	HH10	Jabalia	October 20, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources.	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				- Available GRM for the project	
Hassan Al Banna-owner of HH11	HH11	Al Mughraqa	October 22, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities. - The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.
Akram Al Tarhouny-owner of HH12	HH12	Deir Al Balah	October 22, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day, as well as an onsite diesel generator. - The site is located in an agricultural area, where no crops of biological concern are found to be cultivated, therefore, no

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				utilities, and biological resources. - Available GRM for the project	neighbors or trees are found to be affected during different project phases. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include a solar water heater and water tanks, needs to be relocated or removed.
Salah Al Sha'er- owner of HH13	HH13	Khanyounis	October 22, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. - The site is located in an agricultural area, where no crops of biological concern are found to be cultivated, therefore, no neighbors or trees are found to be affected during different project phases. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include water tanks, needs to be relocated or removed.
Shaker Abu Hammad- owner of HH14	HH14	Bani Suhaila	October 22, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day. A UPS battery is used to store energy to be used during longer power cuts for lights and devices that consume little power. - No biological resources are found to be affected by the project activities.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
				utilities, and biological resources. - Available GRM for the project	- The available area for the proposed PV installations is sufficient that no utilities/objects are found on the roof.
Zeyad Abu Jeba-owner of SME1	SME1	Gaza	October 17, 2020	- Project components, activities and specifications - Project environmental and social requirements - The existing energy sources at the household. - The site conditions in terms of available area, existing utilities, and biological resources. - Available GRM for the project	- The customer is aware of the system components, capacity, price, specifications, payment mechanisms, and the GRM. - The household depends on electricity from the public grid (GEDCo) with power cuts of more than 12 hours per day, as well as an onsite diesel generator. - The available area for the proposed PV installations is sufficient and none of the utilities/objects found on the roof, which include two satellite dishes and two water tanks, needs to be relocated or removed.
Neighbors of the sub-projects sites*					
Neighbors of HH1	HH1	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH1 have any problem with regards to the project construction or operation. - Omar Nasser, one of the site neighbors, believe that such projects are recommended due to their positive environmental impact.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Neighbors of HH2	HH2	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- The neighbors of HH2 believe that the benefits of such project are much more important and significant than any expected local and short term nuisance. - Ahmed AlQudwa, member of the building's council, stated that the council would study the installation of a PV system for the building's main services as part in the project, given the high specifications of the provided system components.
Neighbors of HH3	HH3	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH3 have any problem with regards to the project construction or operation. - Iyad Al Zayigh, one of the site neighbors, is thinking of taking part in the project to install a PV system for his house, given the easy payment mechanism.
Neighbors of HH4	HH4	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH4 have any problem with regards to the project construction or operation. - Adel Abu Kmail, one of the site neighbors, is waiting for the results of the implementation of the system at HH4 to install a PV system for his house, given the high specifications of the provided system components and the easy payment mechanism.
Neighbors of HH5	HH5	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- The area is familiar with such projects; some households in the vicinity of HH5, already have installed PV systems; and no problems or impacts were encountered. - Abu Saleem Badawi, one of the site neighbors, believe that the provided specifications and payment mechanism would encourage more people to take part in the project.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Neighbors of HH6	HH6	Gaza	October 18, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH6 have any problem with regards to the project construction or operation. - Wael Al Hirbawi and Essam Hijazi, neighbors of the site, agree that such project is safe, clean and economic.
Neighbors of HH8	HH8	Beit Lahia	October 18, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH8 have any problem with regards to the project construction or operation. - Mohammed Alashqar, owner of a grocery store in the vicinity of the site, indicated his willingness to install a PV system through this project given the proposed specifications and payment mechanism.
Neighbors of HH9	HH9	Beit Lahia	October 20, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH9 have any problem with regards to the project construction or operation. - Aysar Nasrallah, one of the neighbors, indicated his willingness to install a PV system through this project given the positive environmental and social impacts of such projects as well as the proposed specifications and payment mechanism.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Neighbors of HH10	HH10	Jabalia	October 20, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH10 have any problem with regards to the project construction or operation. - The area is familiar with such projects; some households in the vicinity of HH10, have already installed PV systems; and no problems or impacts were encountered. - Bassam Jabr, one of the neighbors, believe that the benefits of such project are much more important and significant than any expected local and short term nuisance.
Neighbors of HH11	HH11	Al Mughraqa	October 22, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH11 have any problem with regards to the project construction or operation. - Mohammed Abu Dahrouj, one of the neighbors, indicated his willingness to install a PV system for his house through this project given the proposed specifications and payment mechanism.
Neighbors of HH14	HH14	Bani Suhaila	October 22, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of HH14 have any problem with regards to the project construction or operation. They believe that the benefits of such project are much more important and significant than any expected local and short term nuisance. - Mohammed Redwan, neighbor of the site and owner of an Internet café, has already installed a PV solar system for his enterprise and believe that more people should consider the implementation of such projects for the many benefits they could gain through such systems, from social and economic perspectives.

Table 5-1: Summary of the Key Stakeholders Meetings and Outcomes

Person	Site	Location	Date	Issue Discussed	Main Outcomes/Concerns
Neighbors of SME1	SME1	Gaza	October 17, 2020	-The impact of the sub-project on the neighbors of the project site during operation and the impacts during construction. - GRM process and available complaints channels.	- None of the neighbors of the filling station (SME1), who live to the north and the west of the site, have any problem with regards to the project construction or operation. - Rami Al Jabri, Ismael Abed and Lo'ai Hrarara, neighbors of SME1, believe that the benefits of such project are much more important and significant than any expected local and short term nuisance. The project will replace the recent noisy diesel generators in the filling station site.
***** No neighbors were interviewed in the vicinity of HH7, HH12 and HH13 given that these sites are located in open agricultural areas.					

5.2. Grievance Redress Mechanism

The grievances related to the proposed activities for the PV installations for the different sub-projects (Households & SMEs) are limited to complaints from the surrounding communities during the different project phases. A grievance redress or complaints handling mechanism was created to ensure that PAPs have the access to a viable system to air grievances and to seek resolution with no intimidation or coerciveness. The grievance system is also important for PENRA and GEDCo to ensure they are accountable to complaints and that these complaints are handled transparently and efficiently.

A grievance redress mechanism has been established by PENRA for this project, and it is being used in coordination with GEDCo. The established GRM follows clear and smooth administrative procedures, in order to provide sufficient time and effort, and to optimize the complaints from the reception to completion or closure. The following is a description of the Grievance Redress Mechanism (GRM) in use.

Definitions:

- **Complaint**: is an expression of written or verbal dissatisfaction by the complainant to the complaints officer in the headquarter of the electricity distribution company in the Gaza Strip expressing his dissatisfaction with service or damage caused to him as a result of the implementation of the project.
- **Complainant**: A person or company who has suffered damage due to the implementation of one of the components of the project or its implementation mechanisms or results.
- **Complaints Officer**: The customer service employee in GEDCo.

Procedures for receiving and handling complaints:

The following procedures aim to regulate and facilitate the process of receiving and handling complaints in order to develop and provide better service to the local community and rectify any harm suffered by the affected party as a result of the implementation of the fifteen sub-projects within the various procedures and regulations.

First: Pre-complaint stage

The complainant should take into consideration when submitting the complaint the following things as they contribute to saving time and effort on the parties, which are as follows:

- The subject matter of the complaint is related to the components of the project and its implementation mechanisms or results.
- The complainant has suffered direct or indirect damage resulting from the implementation of the project.

Second: Receiving the complaint

Complaint Procedure:

- The complainant shall submit a complaint to the competent authority to receive complaints in one of the following ways:
  1. Personal attendance of the complainant at GEDCo headquarter.
  2. Through the website of GEDCo, by completing the complaint form attached in the project dedicated page: http://eservices.gedco.ps/Complaint/.
  3. Telephone number of the GRM officer at GEDCo: 08 28 470 88.

- The complainant to attend and submit a complaint to the competent staff in the complaints offices in GEDCo.
- If the complainant chooses to submit the complaint electronically via the website of GEDCo, the computerized system will transfer the complaint electronically to the competent employee in the company.
- In case of telephone call, the complaint officer will receive and register the complaint.
- The complainant shall fill in the form approved in writing and signed or electronically approved including all his data.
- The complainant shall attach any documents supporting the complaint if any.
- The employee responsible for verifying the data submitted in the form and handing over the complainant a follow-up ticket. In the event of filing a complaint through the system, the complainant receives a number that can follow up the complaint by telephone.
- The competent employee to enter the data of the complainant and the content of the complaint on the computerized system in the event that it was submitted in writing or through the phone.

Accept or reject the complaint and refer it to the competent authority:

- The concerned employee shall inform the complainant of accepting the complaint or rejecting it within *three working days* from the date of submission of it as a maximum.
- The competent officer shall refer the complaint to the competent authority to consider the complaint.
- The competent authority to which the complaint has been referred shall submit the response within *ten working days* from the date of receipt.
- The relevant Complaints Officer shall inform the Complainant of the readiness of the response and the necessity of attending to receive the reply in person.

Third: Studying the complaint and following-up

In the event of acceptance of the complaint, the competent complaints officer shall study the nature of the complaint and refer it to the competent authority as follows:

- Validating the information and documents attached to the complaint.
- Ask the complainant about any additional information about the complaint if necessary.
- Transfer the complaint to the competent authority.
- The competent authority to respond to the complaint and provide support if necessary.
- The complaints officer of GEDCo shall inform the complainant of the response.

Fourth: Closing the complaint and preparing reports

The complaint shall be closed in one of the following cases:

- If the subject of the complaint is not related to the components of the project and the mechanisms of its implementation or its results.
- After informing the complainant of the response and resolving the complaint.
- If the complainant asks to close the complaint or stop following it.
- If an amicable resolution of the complaint is reached.
- If the complaint is deemed to be malicious.

Complaints shall be submitted as follows:

- *Monthly reports* to the Director General of the Project Monitoring Unit of the Energy and Natural Resources Authority.
- *Quarterly reports* to the World Bank's competent authority.

Fifth: unsettled complaints:

- In case the complaint officer does not receive the response after exhausting the period mentioned above, the complaint is considered to be defective.
- The faulty complaint shall be forwarded by the responsible officer to the Director General of the Project monitoring Unit of PENRA Authority for processing and follow up, accompanied by recommendations and suggestions, provided that the response shall be within a maximum period of *ten working days*.
- If the Director General of the PMU does not receive any response regarding the complaint after addressing the competent authority within a period of *seven working days*, the Director General shall refer it to the Head of the Energy and Natural Resources Authority for appropriate action.

Sixth: appeals process:

Where the complainants are not satisfied with the internal procedures for handling complaints, the outcomes of the complaints or for any unhandled complaints, the complainants have right to refer their complaint to the Cabinet's Unit for grievances.

Once all possible redress has been proposed and if the complainant is still not satisfied then they should be advised of their right to legal recourse.

6. Potential Environmental and Social Impacts and Mitigation

The main potential impacts that could arise from the different phases of the Project were identified and their significance was assessed so that any potentially significant impacts can be properly mitigated and monitored.

The identification and analysis of impacts consist of reviewing the design information submitted by the Project Proponent (PENRA in this case), in conjunction with the baseline information of the project sites. Impacts from similar projects are also examined so as to identify potentially significant impacts on the environment and surrounding communities.

The key activities during the construction phase include the site clearance, mobilization of equipment, installation of mounting structures and PV panels, and the electrical connections; while the main activities after the implementation of the system will include the normal operation activities and the maintenance activities.

The affected environmental and social parameters were identified based on the Environmental and Social Framework (ESMF) and the generic ESMP prepared for the project, the public consultations, the sites visits, and the experience of the consultant with similar projects. Then, the significance of the identified impacts was assessed taking into consideration different factors including nature, magnitude, geographical extent, timing, duration and reversibility of the impact. Identification of potential environmental and social impacts was facilitated by the use of the screening checklist provided in the project ESMF. The checklist was filled for each sub-project (See Annex 5); accordingly, the project environmental and social category and the site-specific impacts are determined, where all of the fifteen sub-projects were found to fall under category B with manageable adverse environmental and social impacts.

Based on the screening process, the environmental and social elements of concern during the construction and operation and maintenance phases for the fifteen sub-projects were defined are summarized in Table 6-1. Detailed discussion of the expected impacts on these elements is provided under sections 6.1 and 6.2.

Table 6-1: Summary of the Environmental and Social Screening Results

	Environmental/Social element	Relevant questions/ESMF checklist	HH1		HH2		HH3		HH4		HH5		HH6		HH7		HH8		HH9		HH 10		HH 11		HH 12		HH 13		HH 14		SME 1	
			C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O	C	O
Environmental	Biological Resources	Q3, Q8, Q9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Air quality	Q11	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Noise Quality	Q19	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Land Use	Q5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Water Resources	Q4, Q7, Q10, Q12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Hazardous materials and waste	Q6, Q13	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Social	Public Health	Q13, Q16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Occupational Health and Safety	Q13, Q16	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Employment	Q15	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Livelihood	Q17, Q18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Energy Supply	-	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
	Existing services and utilities	Q14	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-	x	-
	Protected areas and Cultural Heritage	Q2, Q3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	Nuisance to neighbors/neighboring properties	Q19	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

Responding to the impacts identification and assessment, detailed site-specific mitigation measures were identified and evaluated in order to avoid, reduce or remedy the impacts associated with the project implementation during different phases.

The following environmental and social impacts and mitigation measures are specific for the fifteen sub-projects sites, with more discussion made for site-specific issues at each of these fifteen sites.

6.1. Environmental Impacts

6.1.1. Impacts on Air Quality

Based on the assessment of the baseline conditions of air quality as provided in section 4.3 in relation to the proposed project activities at all sub-projects sites, the following Impacts have been recognized.

During Construction

The main sources of impact on air quality during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Taking into consideration the extent and nature of project activities, where transporting vehicles movement is limited and no excavation and backfilling works will take place, in addition to the baseline characteristics of air quality in different sub-projects sites, where vehicles movement on roads around the sites is taking place; it can be concluded that the construction activities will not have significant impact on the air quality parameters in all fifteen sites.

Mitigation measures

The following mitigation measures are recommended for controlling impacts on air quality during construction phase:

- Plan vehicle movements and do not overload vehicles to minimize exhaust emissions.
- Control the speed of transporting vehicles, especially for the sites with unpaved access roads, namely HH6, HH7, HH9, HH10, HH11, HH12 and HH13, and select transportation routes to minimize dust impact on sensitive receivers.
- Assure the use of well-maintained mechanical construction equipment.
- Comply with relevant local emission standards from vehicles and heavy equipment where available and applicable.
- Use water tanks to control the dust for the sites with unpaved roads

Residual Impact

The impacts on air quality from dust and construction vehicles emissions are restricted spatially to the areas directly close to generation and decreasing significance with distance. After the implementation of the mitigation measures, the impacts on air quality during construction in all sub-projects sites are considered *negative short-term and with low significance*.

During Operation and Maintenance

The main sources of impact on air quality during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The operation of the project will not produce any pollutants or greenhouse gases. Rather, it will have a positive indirect impact on the air quality as the solar energy will replace and/or reduce the use of other energy sources that have larger impacts on the air quality, i.e. the use of PV solar systems in some of the sub-projects sites will reduce the effective load of the recently used emergency diesel generators and thus will reduce fuel consumption and greenhouse gas emissions as a result.

Mitigation Measures

No mitigation measures are required.

Residual Impact

The impact on air quality during the operation and maintenance phase is assed as *positive long-term impact with medium significance*, given the small scale of the sub-projects.

6.1.2. Impacts on Noise Quality

The relevant baseline information for this section is presented in Section 4.3. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on noise quality during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Mostly, the construction phase for all sub-projects will include noise generating activities associated with operation of machinery, transport of materials in trucks, and installation of mounting structures and PV modules specially when working on the roofs. In general, the impact of construction noise depends on the proximity of the construction activities to noise sensitive receptors (NSRs), including residential areas, schools, worship places, clinics and hospitals.

The assessment of the baseline noise conditions in each site revealed that the current noise levels at the majority of the project sites are relatively high (70-75 dB) due to their proximity to heavy traffic roads. It is expected that the construction activities will add up more noise to the existing levels to reach about 85 dB during some activities. Such levels of noise exceed the Palestinian Outdoor Noise standards (PS 480-2005) and WBG/IFC guidelines (55 dB day time-45 dB night time for residential areas). These impacts, however, are anticipated to cause temporary and local nuisance.

Mitigation Measures

The following mitigation measures are recommended for controlling noise impacts during construction phase:

- Comply with Palestinian Labor Law regarding provision of protective hearing devices and appropriate safety equipment to workers on construction sites, where construction works are expected to produce noise over an appropriate level.
- Apply OSHA 1910.95 (a) and OSHA 1910.95 (b) regarding exposure periods to different noise levels.
- Provide well-maintained construction vehicles and machinery, in order to minimize noise.
- Prohibit operating heavy or noisy machinery between the hours of 6:00 pm (18.00) and 6:00 am during working days and all day during Fridays or designated local holidays (unless the public will be best served during these hours and approval has been provided by local government, beneficiaries and surrounding residents).

Residual Impact

The residual impacts from noise during construction in all sub-projects sites are considered *negative short-term and with low significance*, given that the impacts are reduced with the application of the mitigation measures stated above and that the existing noise levels are already high.

During Operation and Maintenance

Positive long-term impacts with low significance on noise quality are anticipated during the operation and maintenance of the project.

6.1.3. Hazardous Materials and Waste

The following impacts of hazardous materials and waste have been identified during different project phases.

During Construction

The main sources of hazardous materials and waste during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

No major hazardous materials and waste are expected to be generated during the construction of different sub-projects. The hazardous materials during construction are limited to chemicals from accidental damage or spillage of PV cells and/or batteries, such as lead, cadmium, and acids.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts of hazardous materials and waste during construction phase:

- Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard-compliant products,
- Provide all necessary PPEs for handling hazardous material depending on type and status of material.
- All workers should be familiar with hazardous waste warning signs.
- Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.

Residual Impact

The residual impacts from hazardous material and waste during construction of all project sites are considered *short-term, negative and of low significance*.

During Operation and Maintenance

The main sources of hazardous materials and waste during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The only hazardous materials of concern during operation and maintenance of the PV solar systems are heavy metals, such as lead, cadmium, and acids present in PV panels manufacture and storage batteries, as well as waste of electrical appliances, and scrap metals. Therefore, the end-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently could be a source of risk to the environment.

Any waste generated from the sub-projects, before, during and after installation must be disposed of at the EQA-designated disposal site. The storage batteries are estimated for replacement every three years. Currently, there are no legislations in the Gaza Strip to guide the disposal/ recycling of these hazardous materials, the private sector, however, works on collecting the wasted batteries for recycling. Many small private workshops collect the batteries for 10-15 NIS for each battery and then recycle them. If the battery waste is not collected by the private sector, then it should be disposed in the hazardous waste-designated area in authorized landfills, which is currently available in Juhr Al Deek Landfill in Gaza City.

Decommissioned solar panels have a very high negative impact on the environment due to the presence of some heavy metals used in their manufacture. They thus constitute hazardous waste and must also be disposed of under guidance from the EQA in the hazardous waste-designated area in Juhr Al Deek Landfill.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts of hazardous materials and waste during operation and maintenance phase:

- Dispose packaging and construction waste at approved waste management sites using registered transport services.

- Provide a temporary storage facility to contain disposed storage batteries and solar panels ahead of final disposal to EQA approved facility.
- Contract with recycling workshops/facilities capable of handling battery waste.
- Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.

Residual Impact

The residual impacts from hazardous material and waste during operation and maintenance of all project sites are considered *long-term, negative and of medium significance*.

6.2. Socio-economic Impacts

6.2.1. Impacts on Energy Supply

The relevant baseline information for this section is presented in Section 4.4. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on energy supply during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on electricity supply during construction are almost limited to temporary interruptions in electricity services during reallocation of electrical connections to accommodate the new system.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on electricity and energy during construction phase:

- Work efficiently and within an expedited schedule for implementation of connections reallocation.
- Provide emergency services in a timely manner in coordination with the household owner.

Residual Impact

The residual impact on energy and electricity supply during construction is considered as a *negative insignificant short- term impact*.

During Operation and Maintenance

The main sources of impact on energy during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

The anticipated long-term impacts of the project during operation include increased energy independence and security in case of conflict, longer hours of available power supply, and cleaner and cheaper alternative to private stand-by generators. The proposed systems are designed with sufficient capacities that will cover the basic energy needs of the households.

The impact on energy and electricity during the operation phase, taking into consideration periodic and adequate maintenance and cleaning of the new PV systems, is assed as *positive long-term impact with high significance*.

6.2.2. Impacts on Existing Utilities and Services

The relevant baseline information for this section is presented in Section 4.1. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on existing utilities and services during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on existing service utilities during construction include the interruption of services due to relocation or damage of some utilities that are found on the roofs of the houses including solar water heaters, satellite dishes and water tanks (See section 4.1.). However, given the available space on the target roofs and the method of implementation, i.e. the installations will be placed on the roof surface, no utilities or services are found to be affected as none of them will be relocated or removed. However, some small plants in movable containers are found on the roof of HH7, these plants can be easily relocated. A fabric cover that is installed to provide shade and privacy is also found on this roof; this cover should be removed to provide a shade-free area for the PV installations.

Mitigation Measures

If any utilities and/or service are accidently affected during construction works, urgent repair the damage done to existing facilities should be considered, if repair is not possible the damaged items should be replaced.

Moreover, the plants found on the roof of HH7 should be relocated carefully and the cover should be removed to provide enough shade-free area for the installations.

Residual Impact

The impacts on existing services and utilities during construction of PV installations in the fifteen sites can be completely avoided if the construction activities are properly implemented. Therefore, the residual impact following the implementation of the proposed mitigation measures is considered as a *negative insignificant short-term impact with low significance*.

During Operation and Maintenance

No impacts on existing utilities and services in any of the fifteen sub-projects sites are anticipated during the operation and maintenance of the project.

6.2.3. Impacts on Public and Occupational Health and Safety

In relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on public and occupational health and safety during construction activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on public and occupational health and safety during construction of PV systems could include physical hazards from falling and injuries, risks from movement of heavy machinery, and physical hazards from contact with hazardous material.

Impact on health and safety of workers and the public is of high priority during construction period. Workers are particularly susceptible to impacts from working from height, given that the PV installations in the fifteen sub-projects sites will be roof-top installations.

On the other hand, as construction activities will take place in residential areas, public are also susceptible to safety risks during construction activities.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on workers and public occupational health and safety during construction phase:

- The contractor shall Prepare, submit and implement health and safety plan (OHS) for PENRA approval prior to starting any project activities.
- The contractor shall prepare an Emergency Response Plan (ERP) in coordination with the relevant local authorities. The ERP should include clear procedures for evacuation, severe weather, lockdown, medical emergency, fire emergency, hazardous materials management, and working-during-pandemic; the ERP should also include information about the public emergency services.
- Comply with the Secondary Legislations associated with the Palestinian Labor Law, particularly the Ministerial Cabinet Order No.49, Year 2004 about protection measures from work risks and illnesses and Guidelines No.1, year 2005 on provision of precautionary measures to protect workers at construction sites.
- All workers shall be insured by the contractor for any potential work accidents and injuries according to the Palestinian Labor Law.
- Provide adequate personal protective equipment (PPE) including hard hats, safety goggles, and other appropriate safety equipment to protect workers from injury.
- Provide first aid kits on construction sites and ensure the presence of personnel with the minimum first aid skills at construction site all times.

- Respect all safety measures required for working on rooftops. Apply the OSHA roofing works measures (OSHA 29 CFR 1926.502 (j) (7)) during the installation of roof-top PV systems.
- Take appropriate measures to prevent unauthorized persons from entering the work area and construction sites, particularly children. Provide guards when and where it is found necessary to provide adequate security of the work and protection of the public.
- When working near the roof edge is required, a roofer's kit should be used. The kit is to be installed and maintained consistent with the manufacturer's instructions.
- For SME1, Additional safety measures should be considered to enhance workers safety and to avoid their entrance to the steel roof by providing a safety fence or concrete barriers between the site and the steel roof.

The above mentioned impacts and mitigation measures cover the potential impacts and mitigation measures for the fifteen specific sites during normal conditions. However, some specific measure should be considered during the current Covid-19 pandemic. The virus that causes COVID-19 is mainly transmitted through droplets generated when an infected person coughs, sneezes, or exhales. One can be infected by breathing in the virus when within close proximity of someone who has COVID-19, or by touching a contaminated surface and then his/her eyes, nose or mouth. Therefore, in order to ensure the safety of the public and the workers during the construction activities, the following specific measures should be considered:

- Ensure frequent, sustained hand washing and use of hand sanitizers. All of the installations crews should refrain from shaking hands or other close-proximity interactions.
- Disinfect frequently touched surfaces on the work site after installation such as the electrical panel, ladders, and solar equipment.
- The number of installers should be reduced in order to practice social distancing.

Residual Impact

The impacts on public and occupational health and safety during construction cannot be completely avoided but their chances and magnitude can be minimized with the application of mitigation measures, given that accidents may still potentially occur. Therefore, the residual impact is considered as a *negative short-term impact with low significance.*

During Operation and Maintenance

The main sources of impact on public and occupational health and safety during operation and maintenance activities along with the proposed mitigation measures are discussed hereafter.

Impacts

Potential impacts on occupational health and safety during operation and maintenance of PV systems include the risk on engineer/technician health during the maintenance of PV modules and related inverters and other electrical devices (i.e. electric shocks), and the maintenance of batteries. In addition to physical hazards from falling and injuries due to mechanical reconstruction works.

Mitigation Measures

The following mitigation measures are recommended for controlling impacts on occupational health and safety during operation and maintenance phase:

- Training of the systems owners at each household on the basic instructions for the operation of the system and related inverters and other electrical devices.
- All maintenance activities should be done through qualified engineer and technician/s.
- Power supply connections and breakers should be kept secure against unexpected restart and a warning label must be attached against restarting.
- Protective devices must be serviced regularly according to the manufacturer's instructions.
- Loose connections and scorched cables must be removed immediately.
- The system control room/cabinet must contain all safety measures such as firefighters, free of flammable materials, ventilation, and under the eyes of safety guards.
- A drawing on the control room/cabinet shall provide warning about safety hazards, e.g. smoking, acid handling, etc. as well as emergency shutdown procedures (in Arabic).

Residual Impact

The residual impact on occupational health and safety during operation and maintenance of the project is considered as a *negative short-term impact with low significance*.

6.2.4. Impacts on Employment & Livelihood

The relevant baseline information for this section is presented in Section 4.5. Based on the assessment of baseline findings in relation to the proposed project activities, the following impacts have been identified during different project phases.

During Construction

The main sources of impact on employment during construction activities are discussed hereafter.

Impacts

It is anticipated that the construction activities will create job opportunities for the local community and will provide a temporary source of income over the construction period. Installation crews will mainly be local skilled and semi-skilled labors from the Gaza Strip.

The impacts on employment during construction from all sub-projects components are considered of a *temporary low significant positive impact* due to the limited number of workers who will be involved.

During Operation and Maintenance

The main sources of impact on employment during operation and maintenance activities are discussed hereafter.

Impacts

On the longer term during the operation phase, the solar installations will help to stabilize electricity supply to beneficiary households, while making use of an abundant raw material-sunlight. This could result in cost savings, improved standard of living, and increased household income.

However, some of the project beneficiaries, who are public sector workers, might be affected by salaries disruptions; i.e. delay, cut off or non-payment of their salaries. In such case, if no specific procedures are in place, the project will indirectly be a source of additional fiscal burdens as these employees have to pay their monthly installments for the project. This issue was one of the main concerns raised during the consultation workshop.

Mitigation measures

In order to mitigate the impact of such disruptions on the project beneficiaries, PENRA will coordinate with the WB to provide specific procedures to be followed to ensure that neither the beneficiaries nor the project will be negatively affected, namely PENRA will apply the following actions:

- System capital cost will be paid back in interest-free monthly installments through local banks.
- The monthly installment will not be automatically deducted by the bank, rather PENRA will control the amount to be paid month-by-month for all beneficiaries. Therefore, in case of salaries delay or cut-off, PENRA will contact the local bank to delay payments or deduct smaller amounts.
- Installments payment could be rescheduled case by case to correspond with the specific situation for each case.

Residual Impact

The impact of the project on public sector employees during operation is considered to be a *short-term, negative, low significant impact*.

Table 6-2 summarizes the environmental and social impacts of the project. It provides the duration and time scale of each impact as well as the residual impact after the implementation of the proposed mitigation measures.

Table 6-2: Potential Impacts Significance

	Issue	Phase	Time scale	Residual Impact
Environmental	**Air Quality**	Construction	Short-term	Negative with low significance
		O&M	Long-term	Positive with medium significance
	Noise Quality	Construction	Short-term	Negative with low significance

Table 6-2: Potential Impacts Significance

	Issue	Phase	Time scale	Residual Impact
		O&M	Long-term	Positive with low significance
	Hazardous Materials and Waste	Construction	Short-term	Negative with low significance
		O&M	Long-term	Negative with medium significance
Socio-economic Issues	**Energy Supply**	Construction	Short-term	Negative and insignificant
		O&M	Long-term	Positive with high significance
	Existing Utilities and Services	Construction	Short-term	Negative with low significance
		O&M	---	---
	Public and Occupational Health and Safety	Construction	Short-term	Negative with low significance
		O&M	Short-term	Negative with low significance
	Employment and Livelihood	Construction	Short-term	Positive with low significance
		O&M	Short-term	Negative with low significance

7. Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) is a combination of the proposed mitigation measures for the anticipated impacts and the monitoring plan, which is designed to: 1) ensure that the prediction for the impacts is accurate and 2) assure that the mitigation measures are implemented and they are effective in performing the objectives. The monitoring plan includes the monitoring activities (How?), the responsible party for monitoring (Who?), and the frequency of monitoring (How many?). The ESMP is designed to cover the different phases of the project.

The generated ESMP is mainly built upon the ESMF and the generic ESMP prepared for this project, and adjusted/updated, where required, based on the findings of the data collection and impact assessment processes for this assignment.

The ESMP provided in Table 7-1 lists the main expected impacts in all sub-projects sites. Mitigation measures to be implemented during the construction and operational and maintenance phases are also listed. Environmental and social mitigation and monitoring actions are presented in a matrix format. The matrix includes an identification of the issues, mitigation measures, and responsibility for executing the mitigation measures and monitoring actions.

7.1. Contractual commitments of the ESMP

The ESMP is designed to monitor the effectiveness of the identified mitigation actions, during and after construction. This ESMP should be incorporated in the bidding documents to be issued to contractors, and should also be part of the awarded contracts to these contractors. Moreover, the environmental and social clauses in this ESMP to be included in the ToRs and tender documents including codes of conduct, coordination, monitoring, and reporting.

7.2. Responsible Parties

Mobilization and Construction Phases

A Supervision Engineer from PENRA, will be responsible for managing this plan and for periodic monitoring of the environmental and social aspects and overall compliance with the mitigation measures of this plan during the construction phase.

It is the construction contractor (CONTRACTOR)'s responsibility to take into account all the construction-related mitigation measures listed in this report; when planning and during the construction phase. And it is the Supervision Engineer's responsibility to monitor and document any changes in scope of the proposed project from any of the terms and conditions stated in this report. Both the CONTRACTOR and the Supervision Engineer from PENRA are the primary responsible parties for the mitigation and monitoring tasks during construction; and both shall adhere to informing and coordinating with all applicable stakeholders with relevance to their corresponding mandates.

The CONTRACTOR shall read, consider, and comply with the ESMP for this project. The CONTRACTOR shall act responsibly to provide notification of CONTRACTOR'S schedule to enable the Supervision Engineer to carry out his responsibilities.

The CONTRACTOR shall designate an environmental and social coordinator. This individual(s) shall have good general knowledge of environmental and social issues that are included in Table 7-1. This individual(s) shall be responsible for:

- Coordinating the CONTRACTOR'S work related to compliance with environmental and social mitigation measures.
- Working closely with the Supervision Engineer to ensure that the CONTRACTOR adequately understands the potential impacts, mitigation and monitoring requirements for implementation.
- Working closely with the Supervision Engineer to ensure that the CONTRACTOR modifies or incorporates necessary mitigation actions and monitoring plans to reflect on-site field conditions.
- The cost of mitigation measures and monitoring activities will be part of the contract of the project and it will be paid by the contractor.

Operational and Maintenance Phase

Mitigations measures in the ESMP that are beyond the construction phase are not within the scope of the CONTRACTOR's work; it is solely the responsibility of the responsible person at

each household. In addition, the monitoring activities will be taken by PENRA/EQA. The operational phase includes all O&M activities, which begin as soon as the project is handed to the project owner. The cost of mitigation measures and monitoring activities will be part of the yearly O&M budget for hospital and clinics.

7.3. Reporting

Compliance monitoring will be conducted, using the specific measures relevant to, and prescribed for the activities. The monitoring will also assess the general environmental and social performance. Monitoring report should contain information with regard to environmental and social compliance as well as any difficulty or outstanding works need to be prepared using an environmental and social compliance checklist (See Annex 7).

During construction phase, the contractor will be responsible for submitting a daily report to the supervision engineers at PENRA, the report should include number and type of complaints and how they were resolved, any accidents resulting chemical leakage and how they have been resolved, how and when the households are informed of any electricity interruptions?, when the public were informed of work schedules and management plans?, and health and safety accidents, if any, and their resolution. The supervision engineers at PENRA in turn will be responsible for submitting a weekly monitoring report to the Project Monitoring Unit of PENRA, who will report to the Bank to notify it of the main findings. While during operation, PENRA-PMU in coordination with EQA will be responsible for the preparation of monthly reports for their records; to be shared with the WB.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
Construction Phase					
Environmental Impacts					
Air Quality • Minor impact due to vehicle movements.	• Plan vehicle movements and do not overload vehicles to minimize exhaust emissions. • Control the speed of transporting vehicles, especially for the sites with unpaved access roads, namely HH6, HH7, HH9, HH10, HH11, HH12 and HH13, and select transportation routes to minimize dust impact on sensitive receivers. • Assure the use of well-maintained mechanical construction equipment. • Comply with relevant local emission standards from vehicles and heavy equipment where available and applicable.	• Contractor	• Document air quality concerns • Document complaints and how they were resolved.	• Monitoring – CONTRACTOR Oversight – SUPERVISION ENGINEER, PENRA and EQA	Daily – Work activities.
Noise Quality • Nuisance on workers and local residents due to noise generating activities associated with operation of machinery, transport of materials in trucks, and installation of mounting	• Comply with Palestinian Labor Law regarding provision of protective hearing devices and appropriate safety equipment to workers on construction sites, where construction works are expected to produce noise over an appropriate level. • Apply OSHA 1910.95 (a) and OSHA 1910.95 (b) regarding exposure periods to different noise levels. • Provide well-maintained construction vehicles and	• Contractor	• Document noise concerns • Document complaints and how they were resolved.	• Monitoring – CONTRACTOR • Oversight – ENGINEER, PENRA and EQA	Daily – Work activities.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
structures and PV modules	machinery, in order to minimize noise. • Prohibit operating heavy or noisy machinery between the hours of 6:00 pm (18.00) and 6:00 am during working days and all day during Fridays or designated local holidays (unless the public will be best served during these hours and approval has been provided by local government, beneficiaries and surrounding residents).				
Hazardous Materials and Waste • The hazardous materials during construction are limited to chemicals from accidental damage or spillage of PV cells and/or batteries, such as lead, cadmium, and acids.	• Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard-compliant products, • Provide all necessary PPEs for handling hazardous material depending on type and status of material. • Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous Waste Management Plan attached in Annex 6.	• Contractor	• Record and document any accidents resulting chemical leakage and how they have been resolved	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA and EQA	Daily – Work activities.
Socio-economic Impacts					
Energy Supply • Limited to temporary	• Work efficiently and within an expedited schedule for	• Contractor	• Document how, and when the households are	• Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
interruptions in electricity services during reallocation of electrical connections to accommodate the new system.	implementation of connections reallocation. • Provide emergency services in a timely manner in coordination with the household owner.		informed of any electricity interruptions.		
Existing Utilities and Services • Interruption of services due to relocation or damage of some utilities that are found on the roofs of the houses including solar water heaters, satellite dishes and water tanks.	• Repair the damage done to existing facilities during construction or replace the damaged items if repair is not possible. • The plants found on the roof of HH7 should be relocated carefully and the cover should be removed to provide enough shade-free area for the installations	• Contractor	• Periodically consult site survey results and design layout for existing utilities • Document how, and when the households are informed of any services interruptions.	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities.
Public and Occupational Health and Safety • Physical hazards from falling and injuries, risks from movement of heavy machinery, and physical hazards	• The contractor shall Prepare, submit and implement health and safety plan (OHS) for PENRA approval prior to starting any project activities. • The contractor shall prepare an Emergency Response Plan (ERP) in coordination with the relevant local authorities. The ERP should include clear procedures for evacuation, severe weather, lockdown, medical	• Contractor	• Record when the public was informed of work schedules and management plans • Conduct periodical site inspections	• Monitoring – CONTRACTOR • Oversight – SUPERVISION ENGINEER, PENRA	Daily – Work activities. e

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
from contact with hazardous material. • COVID-19 infection given that the construction works will take place during this pandemic	emergency, fire emergency, hazardous materials management, and working-during-pandemic plan; the ERP should also include information about the public emergency services. • Comply with the Secondary Legislations associated with the Palestinian Labor Law, particularly the Ministerial Cabinet Order No.49, Year 2004 about protection measures from work risks and illnesses and Guidelines No.1, year 2005 on provision of precautionary measures to protect workers at construction sites. • All workers shall be insured by the contractor for any potential work accidents and injuries according to the Palestinian Labor Law. • Provide adequate personal protective equipment (PPE) including hard hats, safety goggles, and other appropriate safety equipment to protect workers from injury. • Provide first aid kits on construction sites and ensure the presence of personnel with the minimum first aid skills at construction site all times.		• Document and report potential health and safety concerns and their resolution • Record and document any accidents and how they have been resolved • Conduct site visits and document that workers are properly wearing their PPE		

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	• Respect all safety measures required for working on rooftops. Apply the OSHA roofing works measures (OSHA 29 CFR 1926.502 (j) (7)) during the installation of roof-top PV systems. • Take appropriate measures to prevent unauthorized persons from entering the work area and construction sites, particularly children. Provide guards when and where it is found necessary to provide adequate security of the work and protection of the public. • When working near the roof edge is required, a roofer's kit should be used. The kit is to be installed and maintained consistent with the manufacturer's instructions • For SME1, Additional safety measures should be considered to enhance workers safety and to avoid their entrance to the steel roof by providing a safety fence or concrete barriers between the site and the steel roof. Specific measure for COVID-19 infection control: • Ensure frequent, sustained hand washing and use of hand sanitizers. All of the installations crews should				

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	refrain from shaking hands or other close-proximity interactions. • Disinfect frequently touched surfaces on the work site after installation such as the electrical panel, ladders, and solar equipment. • The number of installers should be reduced in order to practice social distancing.				
Element and Impact	**Mitigation Measures**	**Execution Responsibility**	**Monitoring Activity**	**Monitoring Responsibility**	**Monitoring Frequency**
Operation and Maintenance Phase					
Environmental Impacts					
Hazardous Materials and Waste • Hazardous materials resulted from the end-of-life disposal of PV panels and storage batteries, such as lead, cadmium, and acids present in PV panels manufacture and storage batteries. • Waste of electrical appliances, and scrap metals	• Dispose packaging and construction waste (used during maintenance activities) at approved waste management sites using registered transport services. • Provide a temporary storage facility to contain disposed solar panels ahead of final disposal to EQA approved facility. • Contract with recycling workshops/facilities capable of handling battery waste. • Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully according to the Hazardous	• Responsible person at each household	• Conduct periodic inspections of waste storage areas and document the status of stored materials, • Create and periodically check a hazardous waste record keeping	• PENRA/EQA •	As needed– During operation/dismantling

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	Waste Management Plan attached in Annex 6.				
Socio-economic Impacts					
Public and Occupational Health and Safety • Risk on health during the maintenance of PV modules and related inverters and other electrical devices (i.e. electric shocks). • Physical hazards from falling and injuries due to mechanical reconstruction works.	• Training of the systems owners at each household on the basic instructions for the operation of the system and related inverters and other electrical devices. • All maintenance activities should be done through qualified engineer and technician/s. • Power supply connections and breakers should be kept secure against unexpected restart and a warning label must be attached against restarting. • Protective devices must be serviced regularly according to the manufacturer's instructions. • Loose connections and scorched cables must be removed immediately. • The system control room/cabinet must contain all safety measures such as fire fighters, free of flammable materials, ventilation, and under the eyes of safety guards. • A drawing on the control room/cabinet shall provide warning about safety hazards, e.g. smoking, acid handling, etc. as well as	• PENRA • Households owners/responsible person at each household	• Inspect and test all safety features and measures focusing on personal protective features and tools used. (The inspection should verify that issued PPE continues to provide adequate protection and is being worn as required). • document any accidents and how they have been resolved • Conduct site visits and document that workers are properly	• PENRA	Monthly – During operation/dismantling.

Table 7-1: Environmental and Social Management Plan for all sub-projects sites

Element and Impact	Mitigation Measures	Execution Responsibility	Monitoring Activity	Monitoring Responsibility	Monitoring Frequency
	emergency shutdown procedures (in Arabic).		wearing their PPE.		

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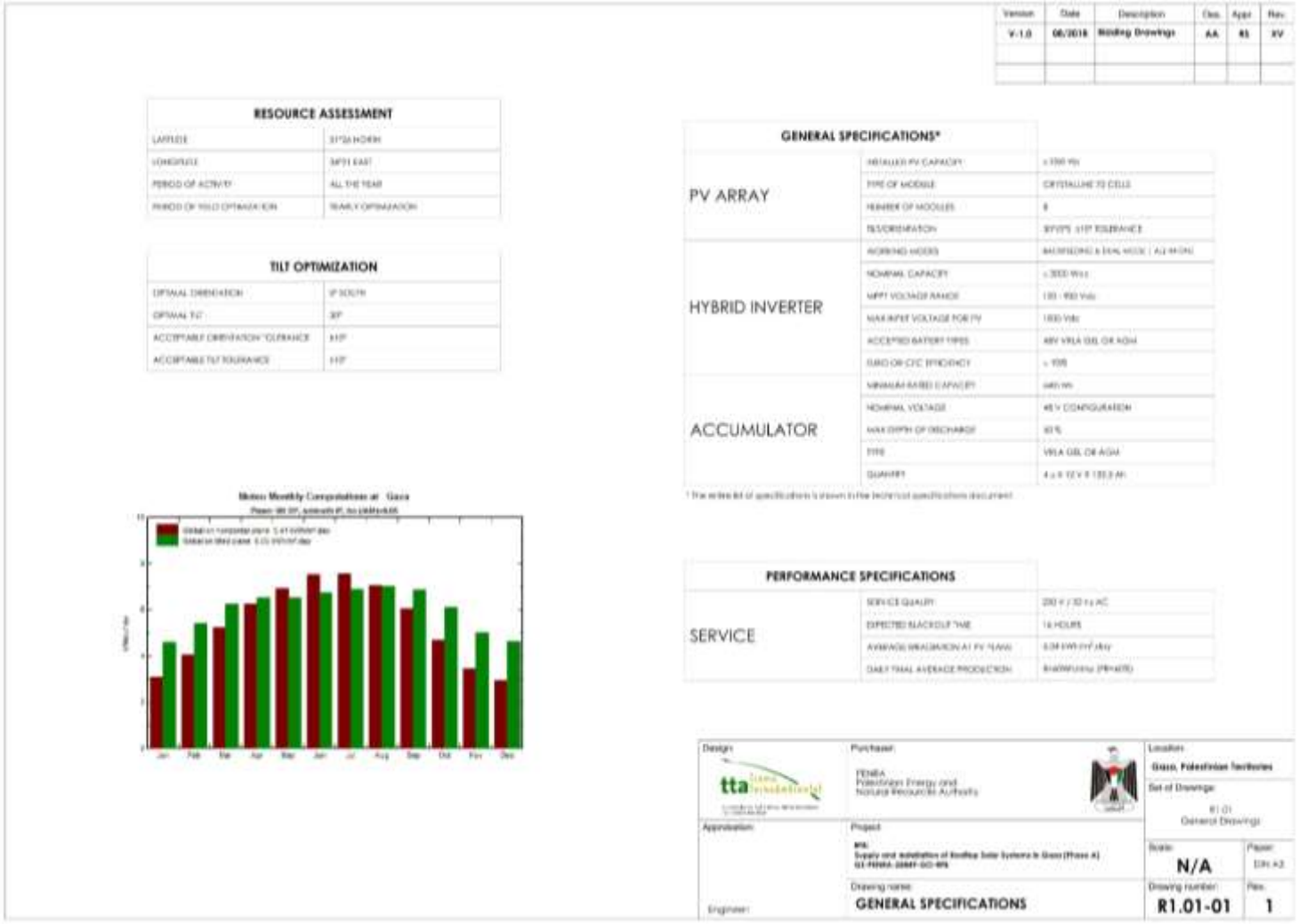
Annex 1: Initial Design of the PV kits



Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2018	Bidding Drawings	AA	KS	XV

RESOURCE ASSESSMENT

LATITUDE	31°26 NORTH
LONGITUDE	34°21 EAST
PERIOD OF ACTIVITY	ALL THE YEAR
PERIOD OF YIELD OPTIMIZATION	YEARLY OPTIMIZATION

TILT OPTIMIZATION

OPTIMAL ORIENTATION	0° SOUTH
OPTIMAL TILT	30°
ACCEPTABLE ORIENTATION TOLERANCE	±15°
ACCEPTABLE TILT TOLERANCE	±15°

GENERAL SPECIFICATIONS*

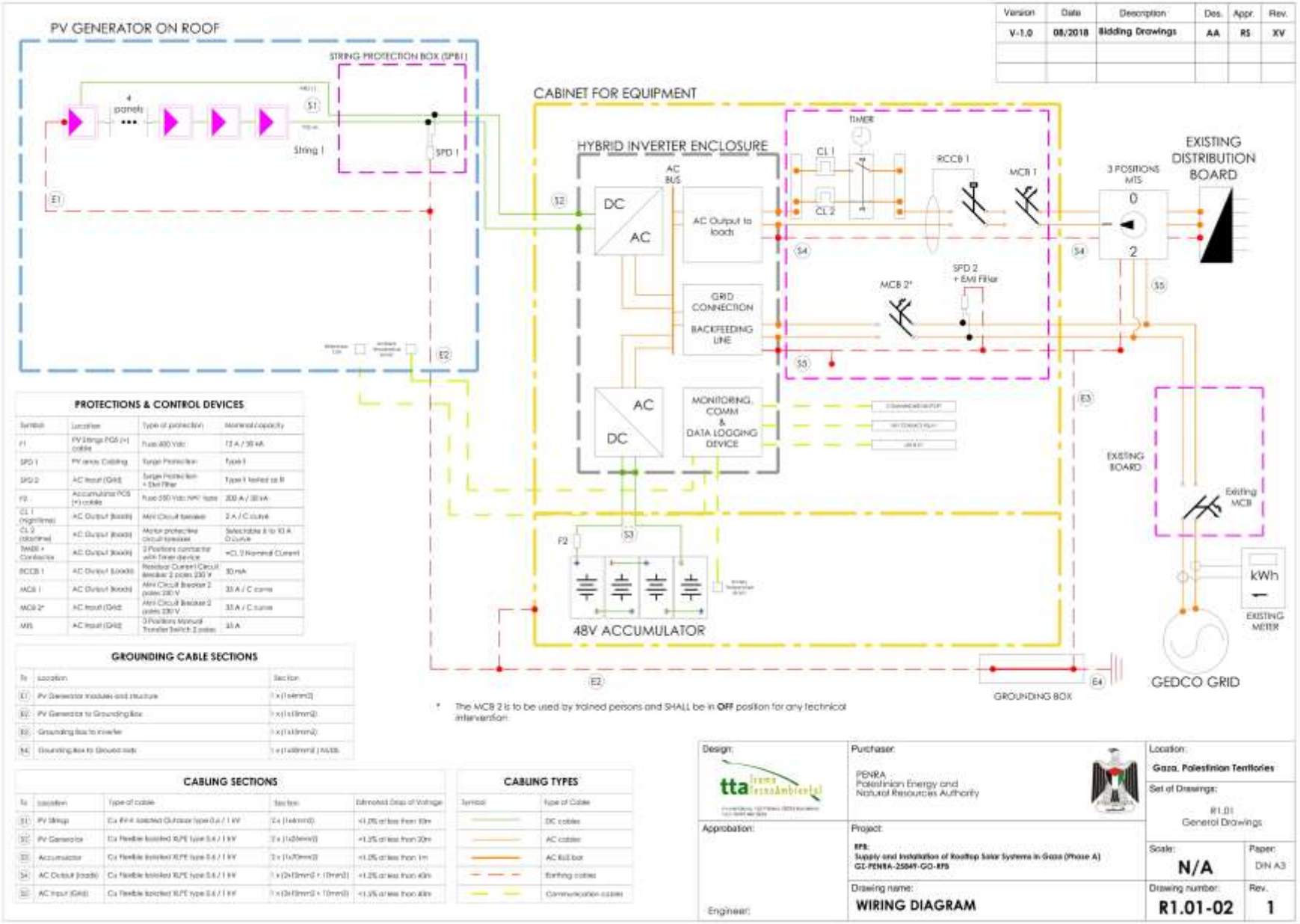
PV ARRAY	INSTALLED PV CAPACITY	≥ 3300 Wp
	TYPE OF MODULE	CRYSTALLINE 72 CELLS
	NUMBER OF MODULES	8
	TILT/ORIENTATION	30°/0°S ±15° TOLERANCE
HYBRID INVERTER	WORKING MODES	BACKFEEDING & ISLAND MODE / ALL-IN-ONE
	NOMINAL CAPACITY	≥ 3000 Watt
	MPPT VOLTAGE RANGE	120 - 450 Volts
	MAX INPUT VOLTAGE FOR PV	1000 Volts
	ACCEPTED BATTERY TYPES	48V VRLA GEL OR AGM
	EURO OR CEC EFFICIENCY	≥ 95%
ACCUMULATOR	MINIMUM RATED CAPACITY	6400 Wh
	NOMINAL VOLTAGE	48 V CONFIGURATION
	MAX DEPTH OF DISCHARGE	50 %
	TYPE	VRLA GEL OR AGM
	QUANTITY	4 x 6 V/ 8 V 130 Ah

* The entire list of specifications is shown in the technical specifications document

PERFORMANCE SPECIFICATIONS

SERVICE	SERVICE QUALITY	230 V / 50 Hz AC
	EXPECTED BLACKOUT TIME	16 HOURS
	AVERAGE IRRADIATION AT PV YEARS	5.04 kWh/m²/day
	DAILY FINAL AVERAGE PRODUCTION	8 kWh/cons. (PR=0.80)

Design: tta	Purchaser: PENRA Palestinian Energy and Natural Resources Authority		Location: Gaza, Palestinian Territories
Approbation:	Project: [redacted]		Set of Drawings: R1.01 General Drawings
		Scale: N/A	Paper: DIN A3
Engineer:	Drawing name: GENERAL SPECIFICATIONS	Drawing number: R1.01-01	Rev.: 1



Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2018	Bidding Drawings	AA	RS	XV

PROTECTIONS & CONTROL DEVICES

Symbol	Location	Type of protection	Nominal capacity
F1	PV Strings POS (+) cable	Fuse 600 Vdc	12 A / 30 kA
SPD 1	PV array Cabling	Surge Protection	Type II
SPD 2	AC Input (Grid)	Surge Protection + Emi Filter	Type II tested as II
F2	Accumulator POS (+) cable	Fuse 500 Vdc HRC type	200 A / 30 kA
CL 1 (nighttime)	AC Output (loads)	Mini Circuit breaker	2 A / C curve
CL 2 (daytime)	AC Output (loads)	Motor protective circuit breaker	Selectable 6 to 10 A D curve
TIMER + Contactor	AC Output (loads)	3 Positions contactor with Timer device	>CL 2 Nominal Current
RCCB 1	AC Output (Loads)	Residual Current Circuit Breaker 2 poles 230 V	30 mA
MCB 1	AC Output (loads)	Mini Circuit Breaker 2 poles 230 V	32 A / C curve
MCB 2*	AC Input (Grid)	Mini Circuit Breaker 2 poles 230 V	32 A / C curve
MTS	AC Input (Grid)	3 Positions Manual Transfer Switch 2 poles	32 A

GROUNDING CABLE SECTIONS

To	Location	Section
E1	PV Generator modules and structure	1 x (1x4mm2)
E2	PV Generator to Grounding Box	1 x (1x10mm2)
E3	Grounding Box to inverter	1 x (1x10mm2)
E4	Grounding Box to Ground rods	1 x (1x50mm2 / rod)

CABLING SECTIONS

To	Location	Type of cable	Section	Estimated Drop of Voltage
S1	PV Strings	Cu 6kV-K Isolated Outdoor type 0.6 / 1 kV	2 x (1x4mm2)	<1.0% or less than 10m
S2	PV Generator	Cu Flexible Isolated XLPE type 0.6 / 1 kV	2 x (1x25mm2)	<1.0% or less than 30m
S3	Accumulator	Cu Flexible Isolated XLPE type 0.6 / 1 kV	2 x (1x70mm2)	<1.0% or less than 1m
S4	AC Output (loads)	Cu Flexible Isolated XLPE type 0.6 / 1 kV	3 x (3x10mm2 + 10mm2)	<1.0% or less than 40m
S5	AC Input (Grid)	Cu Flexible Isolated XLPE type 0.6 / 1 kV	3 x (3x10mm2 + 10mm2)	<1.0% or less than 40m

CABLING TYPES

Symbol	Type of Cable
	DC cables
	AC cables
	AC BUS bar
	Earthing cables
	Communication cables

Design: tta Ingeniería Ambiental

Purchaser: PENRA Palestinian Energy and Natural Resources Authority

Location: Gaza, Palestinian Territories

Set of Drawings: R1.01 General Drawings

Approbation:

Project: RPS: Supply and Installation of Rooftop Solar Systems in Gaza (Phase A) GI-PENRA-25049-GO-RPS

Engineer:

Scale: N/A

Paper: DIN A3

Drawing name: WIRING DIAGRAM

Drawing number: R1.01-02

Rev.: 1

Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2018	Bidding Drawings	AA	RS	XV

Cabling diagram for PV Arrays Including the Combiner Box

String Protection Box (SPB1)
One PV String with eight PV modules in series

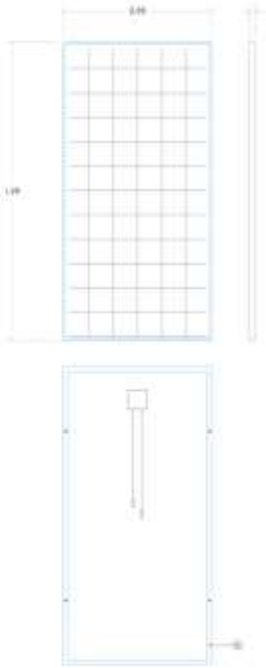
CONFIGURATION	
PV GENERATOR VOLTAGE	LOW VOLTAGE
NUMBER OF STRINGS	1
MODULES PER STRING	8
ARRAYS	1
PV GENERATOR CLASS	GROUNDED

MODULES AT STC*	
N° OF CELLS	72
NOMINAL CAPACITY	320 Wp
Vmpp	8.3 A
Impp	38 V
Isc	9 A
Voc	46 V

*Average specifications under Standard Testing Conditions of: 1000 W/m2, cell temperature: 25ºC and air mass of 1.5 (in accordance with 61215-2)

PV GENERATOR AT STC	
Isc OF GENERATOR	9 A
Voc OF GENERATOR	368 Vdc
CAPACITY OF GENERATOR	2560 Wp

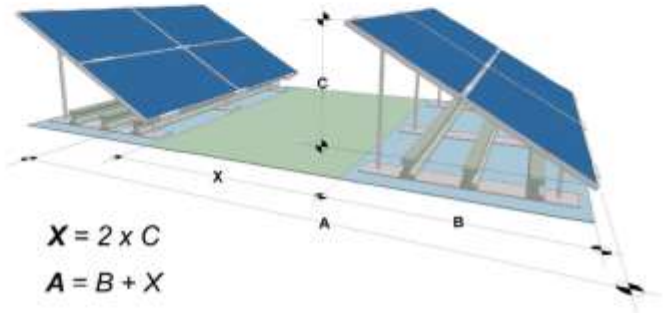
Average PV Module Dimensions



Mounting Structure

If the PV generator needs to be installed in multiple sheds due to characteristics of the roof, it is necessary to keep enough distance between sheds to keep the modules free of shade. This distance, called Pitch, must be at least two times the height of the tilted collector plane plus the horizontal dimension of it:

- **A:** Pitch (Nominal distance between sheds)
- **B:** Horizontal length of a PV Shed
- **C:** Height of a tilted shed
- **X:** Horizontal distance between sheds.



$$X = 2 \times C$$

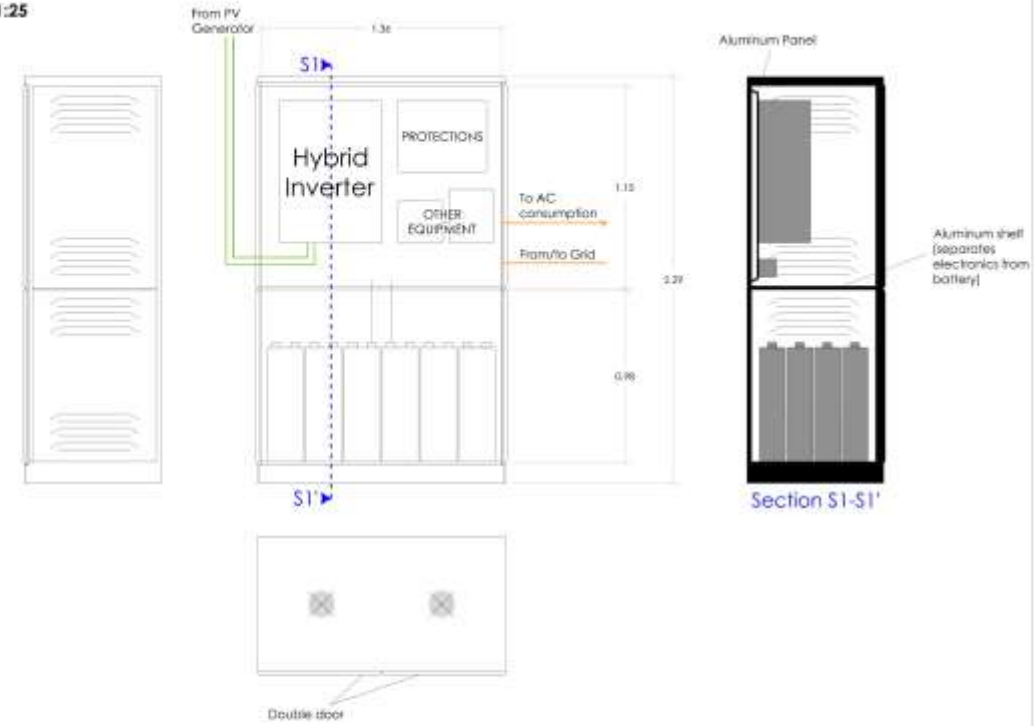
$$A = B + X$$

SUPPORT STRUCTURES	
MATERIAL OF MAIN PIECES	Anodized structural grade aluminum alloy (6063 or 6061 alloy) or Hot dip 85gm galvanized high grade steel painted with a rustproof coating
MATERIAL OF BOLTS, NUTS AND SMALL PIECES	316 grade stainless steel
RESISTANCE TO WINDS	up to 120 km/h
TYPE OF CONNECTION WITH ROOF STRUCTURE	Superposed with ballast, no drilling or penetration of structure
TYPE OF BALLAST	Concrete ballasts made as per International Building Code and ACI318 specifications

Design: tta Ingeniería Ambiental	Purchaser: PENRA Palestinian Energy and Natural Resources Authority	Location: Gaza, Palestinian Territories	
Approbation:	Project: RFS: Supply and Installation of Rooftop Solar Systems in Gaza (Phase A) GI-PENRA-25049-GO-RFS	Set of Drawings: R1.01 General Drawings	
Engineer:	Drawing name: SPECIFICATIONS OF PV GENERATOR	Scale: N/A	Paper: DIN A3
		Drawing number: R1.01-03	Rev. 1

Cabinet for equipment

1:25



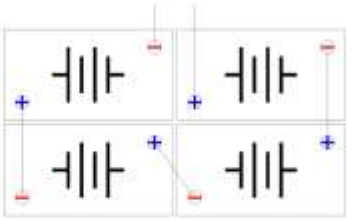
Version	Date	Description	Des.	Appr.	Rev.
V-1.0	08/2018	Bidding Drawings	AA	RS	XV

Battery Specifications
1:10

ACCUMULATOR

- High Quality Valve Regulated Lead Acid (VLRA) deep cycle for solar applications
- 6 or 12V elements (Never a combination of both). GEL or AGM type.
- Ampere-Hour capacity (Ah) at C20 @ 25°C: discharge rate conditions tested below IEC 60896 or IEC 61427
- 1250 cycles or higher at 50% DOD tested under IEC 61427
- Battery Fuse shall be as near as possible to the battery, in all cases at the upper part of the cabinet.

BATTERY VOLTAGE	48 V
NUMBER OF ELEMENTS IN SERIES	8 (6V elements) or 4 (12 V elements)
MINIMUM NOMINAL CAPACITY	133,3 Ah (6.4 kWh) at C20 @ 25°C
USEFUL CAPACITY (50% DOD)	3,0 kWh at C20 @ 25°C
Standards and Certifications of the battery elements	Compliant with IEC 61427, IEC 60896-21, IEC 60896-22, CE, OHSAS 18001:2007, ISO 14001:2014 and ISO 9001:2008



Example of configuration for the Accumulator

GENERAL REMARKS

The cabinet shall be installed in an accessible area near the main distribution board of the building.

The cabinet shall be:

- Protected by a lock
- Installed inside a building protected from water and dust.
- Located in a place without condensation.

The cabinet shall have two compartments with separated ventilation to hold:

- The battery and the temperature sensor in the lower compartment
- The hybrid inverter, the protections and communication devices in the upper compartment.

- All the dimensions given are orientative and shall be adjusted by the bidder according to manufacturer installation requirements.

- Ventilation openings

Design: tta	Purchaser: PENRA Palestinian Energy and Natural Resources Authority	Location: Gaza, Palestinian Territories	
Approbation:	Project: RFS: Supply and Installation of Rooftop Solar Systems in Gaza (Phase A) GIZ-PENRA-25049-GO-RFS	Set of Drawings: R1.01 General Drawings	
Engineer:	Drawing name: SPECIFICATIONS OF CABINET AND BATTERY	Scale: 1:25 & 1:10	Paper: DIN A3
		Drawing number: R1.01-04	Rev. 1

Annex 2: Photos for sub-projects Sites

Proposed site for PV installations at HH1

Southern border of the proposed site for PV installations at HH1

Proposed site for PV installations at HH2 and its northern border

Western border of the proposed site for PV installations at HH2

Southern border of the proposed site for PV installations at HH2

Proposed site for PV installations at HH3 and its western border

Eastern border of the proposed site for PV installations at HH3

Southern border of the proposed site for PV installations at HH3

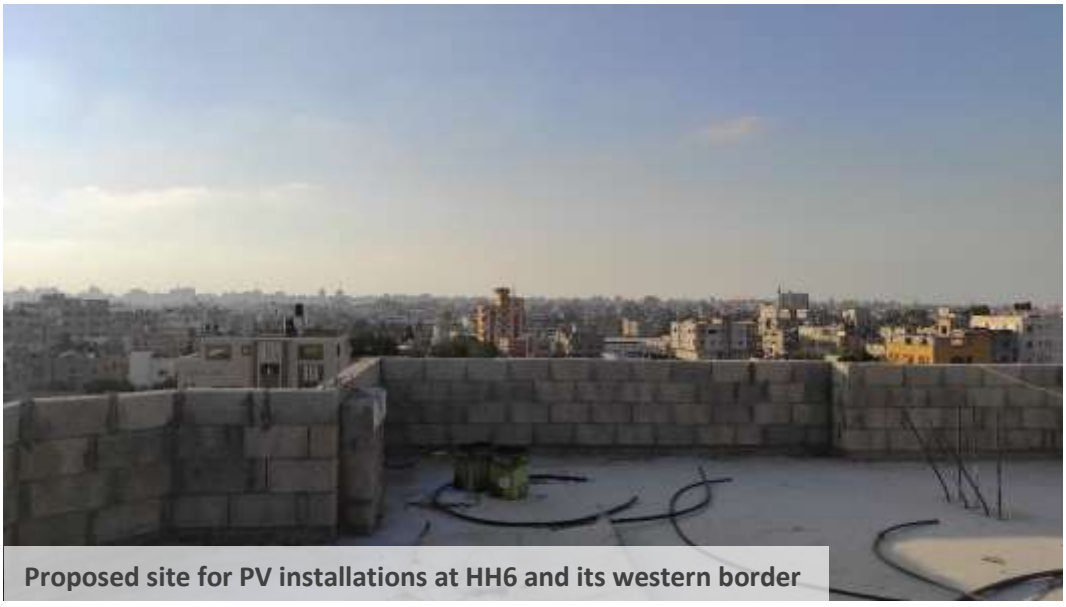
Proposed site for PV installations at HH4 and its eastern border

Proposed site for PV installations at HH5 and its southern border

Southern and eastern borders of the proposed site for PV installations at HH5

Proposed site for PV installations at SME1

Southern border of the proposed site for PV installations at SME1



Proposed site for PV installations at HH6 and its western border

Southern border of the proposed site for PV installations at HH6

Eastern border of the proposed site for PV installations at HH6

Proposed site for PV installations at HH7

Southern border of the proposed site for PV installations at HH7

Proposed site for PV installations at HH8 and its southern border

Western border of the proposed site for PV installations at HH8

Northern and eastern borders of the proposed site for PV installations at HH8

Proposed site for PV installations at HH9 and its western border

Eastern border of the proposed site for PV installations at HH9

Southern border of the proposed site for PV installations at HH9

Proposed site for PV installations at HH10 and its western border

Southern border of the proposed site for PV installations at HH10

Proposed site for PV installations at HH11 and its northern border

Western border of the proposed site for PV installations at HH11

Proposed site for PV installations at HH12

Southern border of the proposed site for PV installations at HH12

Eastern border of the proposed site for PV installations at HH12

Western border of the proposed site for PV installations at HH12

Proposed site for PV installations at HH13

Western border of the proposed site for PV installations at HH12

Southern border of the proposed site for PV installations at HH12

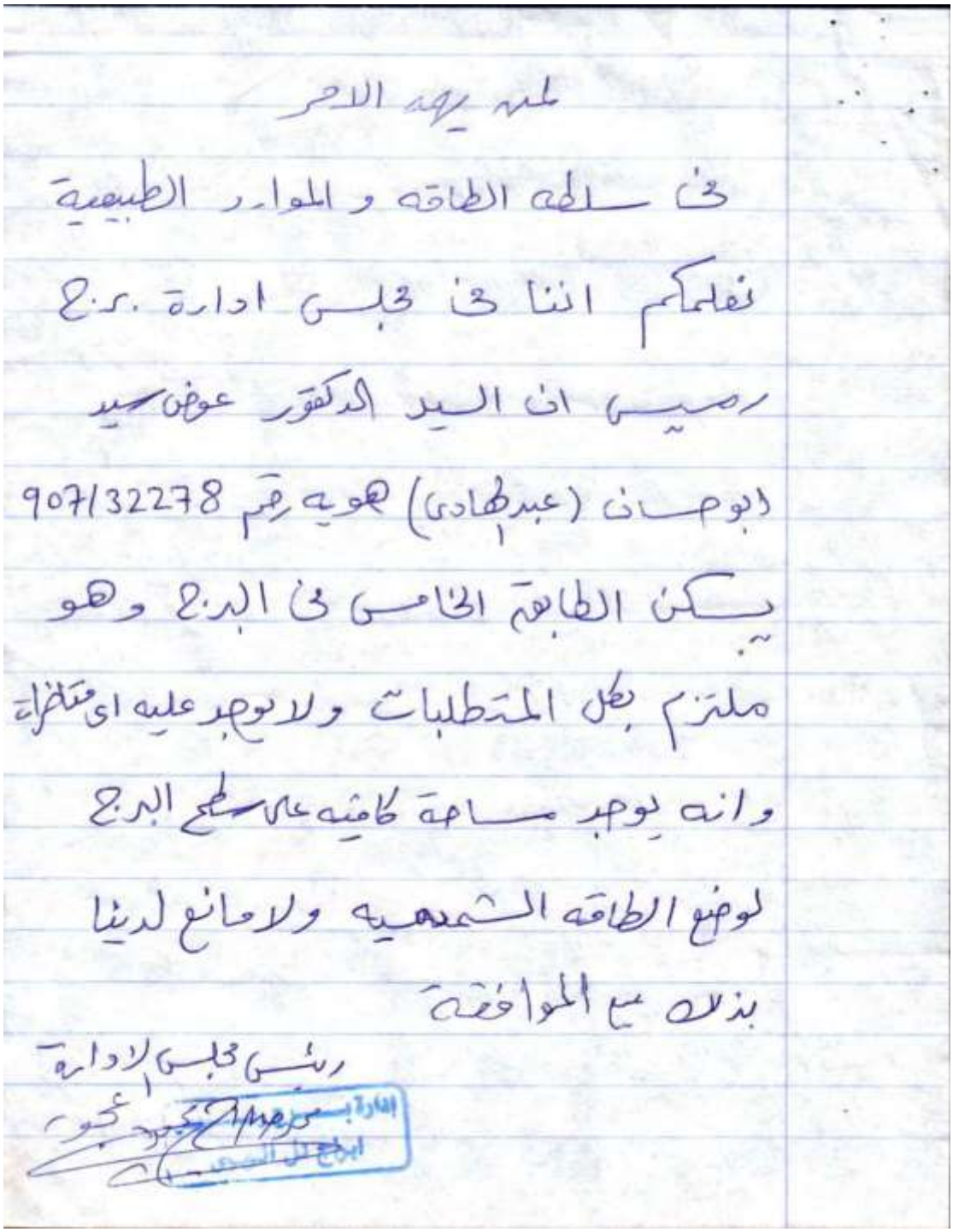
Proposed site for PV installations at HH14 and is western border

Southern border of the proposed site for PV installations at HH14

Northern border of the proposed site for PV installations at HH14

Annex 3: Approvals for using shared roofs for HH1 and HH2

Approval for HH1



الى من يهمه الامر

شركة الطاقة والموارد الطبيعية

نفيدكم اننا في مجلس ادارة ع.ر.ع

رصيص ان السيد الدكتور عوض سعيد

ابو حسان (عبدالهادي) هويه رقم 907132278

يسكن الطابق الخامس في البرج وهو

ملتزم بكل المتطلبات ولا يوجد عليه اي متأخرات

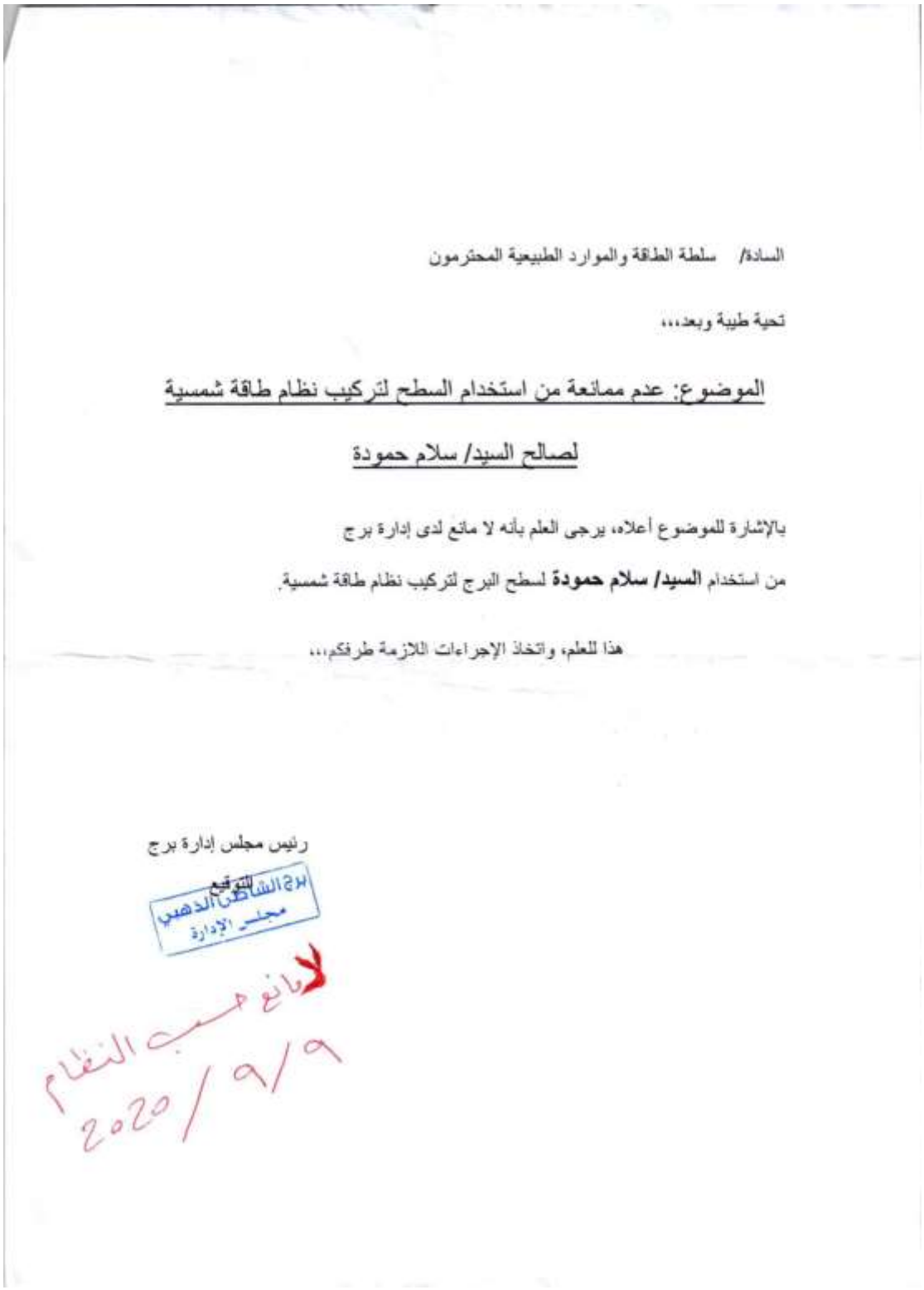
وانه يوجد مساحة كافيه على سطح البرج

لوضع الطاقه الشمسيه ولا مانع لدينا

بذلك مع الموافقة

رئيس مجلس الادارة

Approval for HH2



السادة/ سلطة الطاقة والموارد الطبيعية المحترمون

تحية طيبة وبعد،،،

الموضوع: عدم ممانعة من استخدام السطح لتركيب نظام طاقة شمسية

لصالح السيد/ سلام حمودة

بالإشارة للموضوع أعلاه، يرجى العلم بأنه لا مانع لدى إدارة برج

من استخدام **السيد/ سلام حمودة** لسطح البرج لتركيب نظام طاقة شمسية.

هذا للعلم، واتخاذ الإجراءات اللازمة طرفكم،،،

رئيس مجلس إدارة برج

التوقيع

برج الشاطئ الذهبي
مجلس الإدارة

لا مانع من النظام
2020/9/9

Annex 4: Photos during Individual Meetings

Meeting at HH1

Meeting at HH2

Meeting at HH3

Meeting at HH4

Meeting at HH5

Meeting at HH6

Meeting at HH7

Meeting at HH8

Meeting at HH9

Meeting at HH10

Meeting at HH11

Meeting at HH12

Meeting at HH13

Meeting at HH14

Meeting at SME1

Meeting with one of the neighbors of HH1

Meeting with one of the neighbors of HH2

Meeting with one of the neighbors of HH4

Meetings with neighbors of HH5

Meeting with neighbors of HH6

Meeting with one of the neighbors of HH8

Meeting with one of the neighbors of HH10

Meetings with another neighbor of HH11

Meetings with one of the neighbors of HH14

Meeting with neighbors of SME1

Annex 5: Environmental and Social Screening of the sub-projects

Subproject Name: HH1
Homeowner: Awad Abdelhadi
Name of neighborhood: Tel Al Hawa, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	x	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH2
Homeowner: Salam Hamouda
Name of neighborhood: Southern Rimal, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	x	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH3
Homeowner: Ryad AlBora'i
Name of neighborhood: Tel al Hawa, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	x	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH4
Homeowner: Sami Abu Kmail
Name of neighborhood: Al Nasr, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	x	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH5
Homeowner: Ramadan Ayesh
Name of neighborhood: Al Sabra, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		x
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH6
Homeowner: Bassam Kuhail
Name of neighborhood: Al Tuffah, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH7
Homeowner: Ayyoub Al Attar
Name of neighborhood: Al Salateen, Beit Lahia

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH8
Homeowner: Ayman Ftaiha
Name of neighborhood: Al Twam, Beit Lahia

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH9
Homeowner: Amjad Shaqoura
Name of neighborhood: Al Sudaneya, Beit Lahia

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH10
Homeowner: Mahmoud Shaqoura
Name of neighborhood: Beir Al Na'ja, Jabalia

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH11
Homeowner: Hassan Al Banna
Name of neighborhood: Al Mughraqa

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH12
Homeowner: Akra Al Tarhouni
Name of neighborhood: Abu Miri, Beir Al Balah

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH13
Homeowner: Salah Al Sha'er
Name of neighborhood: Gizan Al Najjar, Khanyounis

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: HH14
Homeowner: Shaker Abu Hammad
Name of neighborhood: Al Fajm/Al Awda, Bani Suhaila

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Subproject Name: SME1
Homeowner: Zeyad Abu Jeba
Name of neighborhood: Al Shejaeya, Gaza City

		Yes	No
A. Will the subproject or subproject site:			
1	Build or rehabilitate any structures or buildings?	X	
2	Be located in or near an area where there is an important historical, archaeological or cultural heritage site?		X
3	Be located within or adjacent to any areas (e.g. protected tree, heritage site, protected area) that are or maybe protected by government?		X
4	Be located on a water-harvesting roof?		X
5	Be located in an area where plans for future land use may affect the project?		X
6	Produce solid wastes during construction, operation or decommissioning?	X	
If the answer to any of the questions 1-6 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks. If the answer to Q2 or Q3 is "yes", follow the EIA procedure.			
B. Environment- will the subproject or any subproject site:			
7	Risk causing contamination of drinking water?		X
8	Need to cut down any trees?		X
9	Be located within or adjacent to environmentally sensitive areas, threatened species or a protected tree?		X
10	Require freshwater during operations?		X
11	Release any pollutants or any hazardous, toxic or noxious substances to the air during construction or operation?		X
12	Will there be any liquid discharge to surface or ground water during construction or operations?		X
13	Involve use, transport, handling or production of substances or materials that can be harmful to human health or raise concerns about the actual or perceived risks to human health?	X	
If the answer to any of Q7-Q11 is "yes ", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks			
C. Social			
14	Will the proposed beneficiary house roof require additional improvement works before the solar panels are installed?		X
15	Will the installation create new and additional jobs?	X	
16	Will there be health impacts during the construction and operational phases?	X	
17	Will the project have adverse impacts on livelihoods? (if the answer is "yes" and livelihoods will be adversely affected, please attach details of how it will be impacted and the type, magnitude and severity of impact)		x
18	If livelihoods will be impacted, are adequate alternatives or compensations considered? (if yes, please provide details)		
19	Are there any disputes/complaints from neighbors/neighboring properties?		X
If the answer to any of Q16, Q17 or Q18 is "yes", please use the indicated section(s) of the ESMF for guidance on how to avoid or minimize risks.			

Based on the screening, the project falls under the following environmental category:

○ A ● B ○ C

Annex 6: Hazardous Waste Management Plan

During the construction and operation phase, hazardous wastes might be produced. Table A4-1 presents the hazardous waste management plan that should be considered as a part of this ESMP. The plan consists of the potential source of hazardous waste, waste type, waste stream and the appropriate management actions of the waste. Moreover, the following sections discuss the required measures to be followed to ensure safe storage, collection, transportation, reuse/recycling and disposal.

Table A4-1: Hazardous Material Management Plan

Potential Source of waste	Waste Type	Waste Stream	Management Actions
Pre-construction Phase			
Potential accidental damage or spillage of PV cells and/or batteries.	Hazardous chemicals	Broken batteries/panels Lead, cadmium, and acids.	- Identify suppliers for different components of the PV system (PV panels, inverters and batteries) of ISO-or best industry standard- compliant products.
Construction Phase			
Accidental damage or spillage of PV cells and/or batteries.	Hazardous chemicals	Broken batteries/panels Lead, cadmium, and acids.	- Provide all necessary PPEs for handling hazardous material depending on type and status of material. - All workers should be familiar with hazardous waste warning signs. - Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully as discussed in the following sections.
Operation and Maintenance Phase			
End-of-life disposal of storage batteries and the solar panels when they fail to perform efficiently	Hazardous chemicals Waste of electrical appliances, and scrap metals	Broken batteries/panels Lead, cadmium, and acids.	- Dispose packaging and construction waste (used during maintenance activities) at approved waste management sites using registered transport services. - Provide a temporary storage facility to contain disposed solar panels ahead of final disposal to EQA approved facility. - Contract with recycling workshops/facilities capable of handling battery waste. - Storage, collection, transportation, recycling/reuse, and disposal of the product waste should be done carefully

Potential Source of waste	Waste Type	Waste Stream	Management Actions
			as discussed in the following sections. - A hazardous waste record keeping should be created and checked by PENRA from time to time to make sure that hazardous waste is well managed.

Storage:

- Broken batteries/panels should be stored in separate containers. The containers should be labelled as “Hazardous waste”.
- Labelling system should be clear and well known to the public and workers to ensue general safety.

Collection and Transferring:

- Hazardous waste should be separated from hazardous waste. Collection of the hazardous waste container should be with special vehicle.
- A form should be filled by the generator and transporter, ahead of transportation, indicating the amount and type of hazardous waste.
- A written permission for transporting the hazardous waste to registered treatment/disposal facility should be issued by EQA.

Reuse/recycling:

- Some small workshops are currently repair old and broken batteries whenever possible; however, no improved battery recycling facilities are currently available in the Gaza Strip.
- Reuse and recycling facilities should be approved by EQA.
- During the recycling process, all safety measures should be applied for chemicals used during extraction and safe storage for the extracted heavy metals should be created.
- All waste generated from the battery recycling facility must be disposed of at the EQA-designated disposal site.
- All liquid waste must be stored in suitable containers for reuse or final disposal according to EQA regulation.
- The separated battery case should be washed, stored and can be used for manufacturing new battery casings.

Disposal:

- Existing technical facilities for treating and disposing of hazardous waste should be assigned before the start of the project.
- If the battery waste is not collected by the private sector, then it should be disposed in the hazardous waste-designated area in authorized landfills, which is currently available in Juhr Al Deek Landfill in Gaza City. Dismantled/broken PV panels should also be disposed of under guidance from the EQA in the hazardous waste-designated area in Juhr Al Deek Landfill.

Annex 7: Environmental and Social Compliance Checklist

Environmental and Social Compliance Checklist (Construction Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
1	Dust and emissions generation					
2	Noise generation					
3	Traffic problems (hindering, detours, closure …etc.)					
4	Timely coordination with schools, health facilities, shops and surrounding communities					
5	Trees removal/replantation/trimming					
6	Landscape/aesthetic element/s deteriorated					
7	Electricity services problems					
8	Interruption of water services					
9	Occupational Health and Safety plan in place					
10	Emergency response plan in place					
11	Accidents in the project site and the surrounding area					
12	Safety nets are used on roofs					
13	Appropriate warning signs are in place					
14	Adequate PPE is used by workers					
15	Working activities take place during schools break					
16	Accidents resulting chemical leakage					
17	Heritage and archaeological sites affected					
18	Other Impacts (Identify)					
Comments:						

Environmental and Social Compliance Checklist (Construction Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
Recommendations:						

Supervision Engineer **Signature:**

Date:

Environmental and Social Compliance Checklist (Operation and Maintenance Phase)

	Project Name:					
	Sub-project site:					
	Location:					
	Date:					
#	**Impact to check**	**Yes**	**No**	**Remarks**	**Action taken**	**Action required**
1	PPE continues to provide adequate protection and is being worn as required					
2	Accidents related to the project O&M activities					
3	Presence of loose connections and scorched cables					
4	The system control room/cabinet contains all safety measures					
5	Changes in the characteristics of the hazardous waste storage containers					
6	Changes in the quantity of materials in storage					
7	Breakages of panels or spills from storage batteries?					
8	Obstructions to easy access to the installed equipment?					
9	Storage batteries are adequately transferred to the recycling facilities/disposal sites					
10	Other Impacts (Identify)					
Comments:						
Recommendations:						

Environmental and Social Officer Signature:

Date: