

# Environmental and Social Management Plan (ESMP)

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INTEGRATED ADOPTION OF ELECTRIC MOBILITY IN JORDAN

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# **1 INTRODUCTION**

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## **1.1 BACKGROUND OF THE PROJECT**

“Integrated adoption of electric mobility” is a child project of the Global Programme to Support Countries with the Shift to E-Mobility funded by the GEF. The objective of the project is to catalyze and accelerate the breakthrough of electric mobility in urban areas in Jordan through innovation and technology transfer.

Jordan’s transport sector contributes 38% of the total national greenhouse gas (GHG) emissions. The shift to e-mobility will reduce emissions of GHG from the transport sector, reduce fossil fuel dependency, lower total energy consumption, reduce noise pollution and improve urban air quality.

## **1.2 OBJECTIVE OF THE ESMP**

The purpose of the Environmental and Social Management Plan (ESMP) is to ensure that social and environmental impacts, risks and liabilities are identified and effectively managed during the design, operation and closure of the proposed project. The ESMP specifies the mitigation, adaptation, prevention and management measures to which the Proponent is committed and shows how the Project will mobilize organizational capacity and resources to account for the factors evaluated in order to implement the compiled measures. The ESMP also shows how mitigation and management measures will be scheduled.

The specific objectives of the ESMP are:

- To outline environmental and social risks, associated impacts and mitigation measures;
- To enhance positive aspects brought by the project;
- To identify roles and responsibilities;
- To propose mechanisms for monitoring and compliance;
- To provide adequate channels of input for the different stakeholders throughout the project activity; and
- To establish proven mechanisms to correct/adjust the findings resulting from the monitoring activities and to include the input received throughout the project activity.

## **1.3 ASSESSMENT SCOPE AND APPROACH**

According to UNIDO’s ESMP guidelines, this project has been categorized as Category B, meaning that the ESMP needs to be developed so that environmental and social sustainability issues are integrated into project design.

Based on the concept document for the project, the screening process has indicated that relevant environmental and social issues in this project are GHG emissions and labour and working conditions. The project document outlines the major components and activities that the project is proposed to realize in the next few years. On this ground, the level of details and complexity of this ESMP and the priority of the identified measures and actions were developed to mitigate potential risks and impacts. In addition, the action plan and monitoring measures contained within the ESMP are supposed to be completed prior to project completion. This ESMP also covers climate risk screening and relevant measures to increase its overall resilience.

The ESMP is a living document that will be updated when required particularly in an unforeseen event and occurring of new risks. The ESMP acts as a quick guide for project implementers and Contractors and eliminate

or minimize the negative impacts of the risks and to enhance positive impacts including socio economic co-benefits through proposed mitigations measures.

The PMU will continuously monitor the risks and follow-up the respective mitigation measures and report on an annual basis through Project Implementation Reports (PIRs). The overall success and progress of implementing the mitigation actions identified in the ESMP will be assessed during the MTE and the TE.

The ESMP is based on UNIDO's Operational Safeguard OS1 (Environmental and Social Assessment) that provides a general outline of how the Agency's environmental and social assessment procedure (E&S procedure) is supposed to work. UNIDO assists its Member States with technical assistance type projects, which largely provide capacity building, training and awareness raising, strategic planning, policy reform, institution strengthening, as well as pilot demonstration of specific technologies. Notwithstanding this fact, UNIDO has designed a procedure to screen all types of projects, and that enables environmental and social issues to be systematically mainstreamed into project design and project document development. The outcome is an approach that allows UNIDO to both analyse risk and maximize environmental and social opportunities.

The requirements of OS1 need to link directly to the four most important stages of UNIDO's project cycle. These are identification/screening, project formulation/preparation, quality assurance/conformity verification, and implementation/monitoring.

Within the context of the project, UNIDO commits to full compliance with the following safeguard standards:

*OS8 - Labour and Working Conditions Safeguard:* ensures that the pursuit of poverty reduction and economic growth through employment creation and income generation should be accompanied by protection of the fundamental rights of workers.

*OS9 - Resource Efficiency and Pollution Prevention Safeguard:* ensures that a project-level approach to resource efficiency, cleaner production processes and pollution management in line with internationally disseminated technologies and practices is adopted.

*OS10 - Community Health, Safety and Security Safeguard:* recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts, and ensures that the health, safety, and security risks and impacts on project-affected communities are avoided or minimized.

The ESMP relies on the following key principles:

### **1.3.1 Compliance with local, national, and international laws**

The project will fully comply with international agenda (e.g., SDG 7, SDG 11), national (e.g., Master Strategy for Energy (2030) of Jordan and the long-term strategies of Ministry of Transport), and local regulations (e.g., environmental protection regulations) during project design and implementation stages. Efforts will be made to make the project outputs sustainable in the long term in the context of new policy developments at all levels.

### **1.3.2 Transparency and inclusivity**

The project will empower individuals and groups through capacity building and awareness raising campaigns to ensure that they fully participate throughout the project.

The project development team will engage in meaningful and transparent consultation with affected communities, particularly with vulnerable groups, to ensure that they can participate in a free, prior and informed manner in decisions about avoiding or managing environmental or social impacts. The inclusivity will

be achieved inter alia via open consultation with stakeholders in the local communities, conduct trainings to local development agency on community engagement, door-to-door invitations through the local social networks etc.

The local community that has been operating the transport services within the touristic site is expected to take up the role to operate the electric bus service in the touristic area of Petra. Details are to be worked out as the pilot technology project and the business model are fine-tuned during the project implementation.

The project aims to promote electric HOVs. Women and youth in Jordan identify the need for public transportation as their top priority request, given the link between transportation and job accessibility. The current transportation systems and plans continue to ignore gender needs and gaps that lead to unequal access to transportation services. This inability to provide quality services is preventing shorter returns on investment and impacting the country's economy by hindering the effective participation of women to the labour market. The e-bus service will provide better accessibility to elderly and the people with disabilities.

### **1.3.3 Systematic assessment and tracking of environmental and social impacts and risks**

The project will aim at providing clear and constructive responses to individuals, groups, and communities potentially affected by projects on potential grievances related to the social and environmental performance of the projects, corrects non-compliance where it has occurred, and shares the results of its review and any actions taken.

During project implementation, any changes likely to have negative social and environmental impacts will be communicated to UNIDO prior to implementation. The key risks to be considered and tracked in a systematic way are described in Section 7 – with a monitoring plan described in Section 8 of this document.

Information will be collected on a real-time and quarterly basis by the Project team and will be treated as confidential within the project, to be kept in computerised form and backed-up by the central UNIDO office. It will be kept for a minimum of 10 years after project completion.

### **1.3.4 Harmonisation with other projects and programs**

The project will aim at maximizing efficiency and minimizing costs in complying with environmental and social safeguards. The project development team will lead discussions at country level to decide on the use of the most appropriate environmental and social safeguards procedures.

### **1.3.5 Gender equality**

The project will identify and integrate the different needs, constraints, contributions and priorities of women and men (other social groups) and where possible, it will aim at enhancing the positive gender impacts of projects by developing mitigation measures to reduce any potential gender specific and disproportionate adverse gender impact. The project's gender mainstreaming entry points are elaborated in detail in a separate document.

### **1.3.6 Climate resilience**

Even though the project's impact area is climate change mitigation, the project will ensure that supported activities takes into consideration climate resiliency and avoid unwarranted increases in greenhouse gas emissions.

## 2 PROJECT DESCRIPTION

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### 2.1 PROJECT SCOPE AND PROPOSED ACTIVITIES

The project's scope includes e-mobility technology investments, institutional capacity building to design, plan and implement e-mobility plans, and strengthening policies. The project interventions will reduce GHG emissions and urban air pollution, increase accessibility of touristic sites while generating significant social benefits- such as employment opportunities and income generation and enhance the access of vulnerable groups to transport services.

Jordan has a semi-arid/arid climate which is characterized by hot dry summers and relatively cool wet winters. More than 80% of Jordan is unpopulated due to desert conditions, where annual precipitation falls even under 50 millimeters. Jordan is generally a flat desert plateau, east and west, deserts stretch across the land. In the west, the Great Rift Valley (high hills and mountains) separates the East and West Banks of the Jordan River.

The project's technical assistance component targets Petra, UNESCO World Heritage site in southern Jordan, one of the world's top tourism destinations which received over one million foreign visitors by 2019. Petra is located 240 km south of the capital Amman. The project priority technology pilot project is to provide an e-mobility tourism transport solution in the 3 different routes in Petra region, given its continuous growth in tourism and planned developments. These 3 route options are given below:

- Option 1: from the basin (tourist assembly area) through Commercial/ Eco-Park through Little Petra to the Visitor Center
- Option 2: from the basin (tourist assembly area) to the Visitor Center
- Option 3: from the Wadi Mousa Gate to the Visitor Center

The maps and further details of the routes are given in detail in the main project document.

The project follows an inter-disciplinary approach involving ministries and national institutions, municipalities, academia, financing institutions (e.g., IFC), and the private sector in the country. The project will closely coordinate with other similar national and international efforts as it is critical to maximise synergies and share knowledge and best practices that can help in increasing efforts towards climate change mitigation, while increasing productivity and generating growth and wealth.

The four main components of the project are:

- Component 1: E-mobility policy coordination and integration through an inter-ministerial forum; integrating fiscal considerations and environmental goals.
- Component 2: Successful implementation of a scalable low-carbon demonstration; the "Petra E-bus" pilot project and scaling up e-mobility interventions through pipeline development and strategies.
- Component 3: Enhancing the capacity of ministerial and private sector partners and facilitate effective knowledge sharing to enable scaling-up.
- Component 4: Monitoring and Evaluation; establishing and implementing effective project monitoring and evaluation mechanisms as well as capturing progress and lessons learnt.

This ESMP focuses on the risks resulting from the activities under the Component 2.

### 2.2 POTENTIAL NEGATIVE AND POSITIVE IMPACT OF THE PROJECT

#### 2.2.1 Potential negative impact of the project

The potential negative environmental and social impacts identified in the ESMP (pre-construction, construction, operation, and decommissioning phases) are localized and temporary with the possibility of mitigation actions.

Environmental and social impact of the project during the construction and operation phase is expected to be minor and temporary. The mitigation measures for potential negative impacts are readily assessed. Any negative impacts would be related to inappropriate maintenance of established equipment/ facilities and the operation of the smart grid/EV stations themselves.

The projected environmental and social risks and proposed mitigation measures for the various stages of the project are presented in **Section 7**.

Impacts of the project on women are analysed in the **Gender Analysis and Action Plan** in detail.

**Future impact of battery production and disposal:** The EV industry is expanding fast, and the associated emerging issue would be discarded batteries. If there are no appropriate measures to collect and control those used batteries, they will cause secondary pollution and make the environmental issues worse, by potential risks of polluting water and underground water, increasing solid wastes in the urban environment, and causing health problems.

Batteries discarded from EVs should be centrally collected and reused as policy and regulations require. One solution would be to establish a monitoring and registering system to require battery manufactures, EV producers and dealers to register each battery produced or used by EVs, knowing where the battery goes and how it is disposed after its life cycle progressing. More detailed, each battery produced by manufactures is given a serial number that is registered with the system for tracking its lifecycle movement. EV batteries can hold up to 70% of their original capacity. The end-of-life batteries can have a secondary life in stationary battery stations. EV battery recycling sector is expected to grow considering the number of used EV batteries coming in the next decades. In the future, management of unrecyclable parts of batteries may include exporting them back to the manufacturer depending on the terms of the purchase agreement or treatment at the approved hazardous waste treatment plants in the countries. In Jordan there is only one hazardous landfill (Suwaqa Hazardous Waste Landfill) located between Amman and Karak. It is managed by the Ministry of Environment.

#### 2.2.2 **Potential positive impact of the project**

The project is geared towards reducing negative impacts of current transportation systems and improving the comfort and efficiency of the built environment. The project will provide technical assistance to procurement and installation of EV charging stations, potentially in combination with solar PV panels and any required electric auxiliary equipment. Renewable energy production through PV integrated into charging stations will further reduce the lifecycle GHG emissions of e-busses. The life cycle of PV panels is expected to be at 20 years. It is assumed that after 20 years it will not be cost-effective or practical to reuse the equipment as technology will have advanced. PV modules contain substances such as glass, aluminium, and semiconductor materials. The other materials may include array framework, electrical cabling, electrical connectors, ducts, inverters, transformers, etc. The environmental and social impacts of decommissioning would reflect its operational history, the projected use of the site and the social and environmental conditions within the program area. Inappropriate disposal of PV panels, stationary batteries, or other electronic equipment such as converters may cause soil contamination. However, several market studies suggest that in the future, the second use/recycling of such materials will have a significant economic value due to expected growth of the battery and e-waste recycling market.

**Environmental governance approach:** Conflicting priorities within and among ministries undermine the possibilities for the effective and long-term implementation of sustainable tourism and transport policies. Jordan lacks vehicular emissions standards for private and public vehicles and there are perverse policy incentives to avoid efficiency upgrades due to high import taxes on new vehicles and spare parts. The project will establish an



inter-ministerial committee on e-mobility to facilitate policy coordination and enhance capacities of policy makers.

**GHG emissions reduction:** Shifting to RE powered e-buses will have a significant emission reduction by avoiding burning fossil fuels in vehicles. The project is expected to mitigate direct and indirect GHG emissions and contribute Jordan's climate targets.

**Improving urban air quality:** When accounting the benefits of saving CO<sub>2</sub> emissions from using EVs, there will be co-benefit of reducing major air pollutants like NO<sub>x</sub>, SO<sub>2</sub>, PM<sub>2.5</sub>, and other pollutants. As expected, if EVs would use clean energy sources, it would have doubled environmental benefits than that of traditional EVs and vehicles fuelled by fossil fuels, benefiting local people of Petra Governorate (population of 38,500) and visiting tourists.

**Improved personal health from less air pollution:** With greater uptake of EVs in the cities, emissions and particular matters from transportation sector will be reduced leading to lesser health problems such as asthma and emphysema.

### **3 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK**

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This section describes relevant national policy, legal, and administrative framework which could define/help shape issues/risks that need to be included into the ESMP. The key national policies relevant for implementation of ESMP are listed in for CEO Endorsement. The project will comply with the strategic directions established by the relevant legislation and policies taking considerable attention to the social and environmental guidelines and recommendations.

#### **3.1 ENVIRONMENTAL LAWS AND REGULATIONS ON TRANSPORT AND LOW CARBON URBAN DEVELOPMENT**

The relevant laws and regulations have been identified and summarized in this section. The legal framework for the environment in Jordan is primarily described in laws, by-laws (or regulations), instructions, standards and specifications. Laws and by-laws are the most general, describing, for example, the overall authorities of a ministry or perhaps one sector within a ministry. Instructions, standards and specifications describe the details regarding how a law is implemented and enforced and the specific standards that must be met. Standards include for example, details such as permissible limits of specific chemicals that can be discharged into sewers or rivers.

The following summarizes the legal framework related to this ESMP:

- I. **The Environment Protection Law (Law No. 6 for the year 2017)**, is entrusted with the responsibility of the protection and monitoring of all environmental elements in coordination with concerned government bodies, national, regional and international organizations. In addition, the law mandates the MOE to draft necessary by-laws, instructions, standards, etc. for environmental elements, which includes water, wastewater, air, land, noise control, etc. The law also gives the ministry the right to environmentally supervise these projects, were any violation to the provisions of the regulations and instructions relating to the protection of environment or non-compliance with the approved mitigation measures makes the project subject to penalties. The regulation also describes to the EIA procedures and scope of work.
- II. **Environmental Classification and Licensing System (Regulation No. 69 of 2020)**. This regulation replaced the Environmental Impact Assessment Regulation No. (37) for the year 2005. It elaborates the classification of all development, economic and infrastructure projects based on its likely impact on the

environment noting development/project scale and other classification criteria, and defines the environmental licensing requirements for each category, including the need for EIA and the type of EIA required. The regulation defines the roles and responsibilities of all related stakeholders, and further explains the roles of the Environmental Classification and Licensing Directorate at the Ministry of Environment (MoEnv) and the EIA committee which is established by the Minister and include representatives of eight key stakeholders. The regulation explains the procedures for obtaining environmental licenses for each category as per of the classification system, and defines the site selection criteria and the EIA requirements and procedures for each. The classification system is provided as appendix to the regulation and it is subject to periodic review by the Directorate and the Committee. This regulation should be read along with the Amendment Regulation No. 97 for the year 2020 (Amendment of the Environmental Classification and licensing System – Regulation No. 69 for the year 2020).

- III. **Waste Management Framework Law no. 16 for the year 2020.** This law governs solid waste management in Jordan, explicit the responsibility of the waste generator (extended responsibility principal), explains the roles and responsibilities of all related management authorities, explains the overall governance of solid waste management at national, regional and local levels, stipulate waste management planning and implementation frameworks, stipulates the licenses needed to establish and operate waste management facilities, specifies pollution prevention measures which might occur by or due to waste management, and detail the inspection frameworks and penalties for non-compliance.
- IV. **The Management of Solid Waste Regulation No. 27/2005** is the main regulation specifically dedicated to municipal solid waste management in Jordan. This Regulation is composed of 7 articles which provides the basic definitions and requirements governing SWM, such as of “solid waste”, “solid waste management”, “solid waste dumps”, etc. Article 4 entrusts the Ministry of Environment with the management of solid wastes. Its competencies and duties are to: (a) prepare plans related to the management of solid waste and lay down necessary programs for their implementation; (b) define the requirements for equipment and instruments used for the management of solid waste; (c) define the methods for the re-qualification of solid waste dumps. Additionally, the Regulation refers to instructions issued to ensure the implementation of its provisions. The Instructions for the Management of Solid Waste (2006) was issued complementary to the Management of Solid Waste Regulation No. 27/2005. The Instruction elaborating on the technical specification related to SWM namely; SW collection, transport and final disposal. Through Article (4), the Instruction states that MoENV should encourage and provide incentives to the private sector in order to invest in SW treatment and recycling. Qualitative and quantitative requirements for the selection and establishment of MSW dumpsites are also provided through the provisions of these Instructions. The Instruction also addresses issues related to the establishment, closure and rehabilitation of SW dumpsites.
- V. **The Regulation for the Prevention of Health Nuisances No. 8/2014.** The main function of this regulation is to control and prohibits any person, entity, or activity from causing any nuisance to anybody or from damaging public health. Such nuisances may include bad odours, noise, waste (solid waste, effluents), or any other practice deemed harmful to public health or sanity.
- VI. **The Management, Transportation & Handling of Harmful and Hazardous Substances Regulation No. 24/2005.** It has 11 Articles covering requirements related to hazardous waste classification, establishment of a technical committee, licensing requirements. Hazardous substances and waste defined as “any substances that cannot be disposed of in the dumping sites designated for general waste, or into drainage networks, due to their hazardous characteristics and their harmful effects on the environment and life forms, and which require special means to treat and permanently dispose of”. According to this regulation, the preparation of technical and other specification related to the different

stages of the management of hazardous substances and waste are delegated to a Technical Committee chaired by Secretary General of the MoENV (members of this technical committee are listed within the Regulation). The responsibilities of this Technical Committee are also provided in the Regulation, which further provides the requirements to be granted authorization for dealing with hazardous substances and waste.

**VII. Instruction for Hazardous Waste Management and Handling (2003):** The Instruction lists general procedures to be carried out by the producer of hazardous waste, procedures related to the collection and storage of hazardous waste, emergency plans and procedures, record-keeping and reporting, and general precautionary measures to be taken into consideration during the packing of hazardous waste. The Instruction also draws special conditions for owners and operators of the site allocated for storage, treatment and final disposal of hazardous waste. Issues related to the safety and well-being of site staff is also discussed as well as conditions for waste storage. Furthermore, Article (10) of the Instruction states that anyone who violates the provisions of these Instructions shall be punished in accordance with the Environmental Protection Law.

The following table summarizes the other relevant Jordanian laws, regulations, instructions and standards for environmental protection, health and safety that are applicable to the project.

Category	Laws, regulations, Instructions, and standards
Water and wastewater	<ul style="list-style-type: none"> <li>• Water Authority Law and its amendments No. 18 for the year 1988.</li> <li>• Groundwater Control Regulation No. 85 of 2002, Issued pursuant to Articles 6 and 32 of Water Authority Law No. 18 or 1988.</li> <li>• Drinking Water Resources Protection Guidelines (2006)</li> <li>• Underground Water Monitoring By-Law (No. 85, 2002)</li> <li>• Instructions on the Protection of water Resources for the year 2011.</li> <li>• Instructions for Disposal of Industrial and Commercial wastewater into the sewage network, issued in accordance with Water Authority Law No. 18 for year 1998 and Article No. 23 of the Sewage System Law No. 66 for the 1994.</li> <li>• Jordanian Standard 202/1991 for industrial wastewater discharge</li> </ul>
Land resources and Ecology	<ul style="list-style-type: none"> <li>• Law of Agriculture NO. 44/2002</li> <li>• Forestry and Soil Protection Law No. 23 for the year 1972, issued in accordance with Article 31 of the Jordanian Constitution.</li> <li>• Soil Protection Regulation NO. 25/2005</li> <li>• Natural Reserves and National Parks Regulation No. (29) / Year 2005.</li> <li>• Regulations for Protection of Birds and Wildlife and rules covering their hunting (No. 113, 1973).</li> </ul>
Air quality	<ul style="list-style-type: none"> <li>• Ambient Air Quality Number JS 1140/2006</li> <li>• Air Protection By-law (No. 28, 2005)</li> <li>• Regulation of Development Zones NO. 2/2008</li> <li>• Instruction for controlling the use of substances that deplete the Ozone layer for the year 2003, issued in accordance with Law No. (1) 2003 Articles 9-15; 'Law for the Protection of the Environment'.</li> </ul>
Noise	<ul style="list-style-type: none"> <li>• Instructions for the Limitation and Control of Noise for the year 2003.</li> <li>• Jordanian Standards for the Prevention and Elimination of Noise (2003)</li> </ul>
Social and Occupational	<ul style="list-style-type: none"> <li>• Public Health Law No.47 for the year 2008.</li> <li>• Law Number (9) for the year 2009 for Preventing Trafficking in Human Beings Traffic Law No. 49 for the year 2008.</li> </ul>

<p>Health and Safety Regulations</p>	<ul style="list-style-type: none"> <li>• Law No. (50) for the year 2006, Ratification of the Children Rights Agreement (Appendix 9).</li> <li>• Trade, Industry and Occupation Safety Law No. 16 for the year 1953.</li> <li>• Labour Law No. 8 for the year 1996 and its amendments.</li> <li>• Civil Defence Law No. 18 for the year 1999.</li> <li>• Regulation No. (36) for the Year 1997. The Regulation of Employment Permits Fees for Non- Jordanian Workers. It was issued by virtue of Article (12) of the Labour Law No. (8) for the year 1996.</li> <li>• Regulation (No. 43, 1998) of Protection and Safety from Industrial Tools and Machines and Worksites – Issued by the virtue of the provisions of Paragraph (c) of Article (85) of the Labour Law No. (8) of 1996.</li> <li>• Regulation for the establishment of Occupational Health and Safety Committees No. (7) / year 1998, issued in accordance to Article (85) of the Jordanian Labour Law No. (8) / year 1996 and its amendments.</li> <li>• Instructions No. (1) For year 2006 or the prevention of occupational hazards related to health hazards resulting from labour housing units onsite, issued in accordance to article (51) of the temporary General Health Law No. (54) For the year 2002.</li> <li>• Instructions concerning the protection of employees and establishments from dangers in the work environment. Issued in accordance with the provisions of Art. 79 of the Labor Code, No. 8 of 1996.</li> </ul>
<p>Infrastructure, Businesses and Public Services Laws and Regulations</p>	<ul style="list-style-type: none"> <li>• Temporary Law No.64 for the year 2002 – General Electricity Law.</li> <li>• Transportation Law, amended (No. 37, 2008), simultaneously read with the Original Transportation Law No. 89 for the year 2003.</li> <li>• Land use planning Regulation No. 6 for the year 2007.</li> <li>• Regulation No. (21)/ year 1999. The Regulation of Private Employment Agencies. It was issued by virtue of the Provisions of Paragraph (B) of Article (10) of the Labor Law No. (8) for the year 1996.</li> <li>• Regulation for the licensing and permitting of excavation and infrastructure network projects (No. 112/2007).</li> <li>• Instructions for the Selection of locations for Development Activities for 2007 issued in accordance with paragraph (d) of Article (4) of the Environmental Protection Law No. 52 for 2006.</li> </ul>

Any additional national regulations relevant to the project interventions will be included in the ESMP during the project implementation.

### 3.2 POLICY ON ELECTRIC VEHICLES

The Ministry of Transport (MoT) identified increasing the total number of public transit users as one of the major objectives of the long-term transport strategy for Jordan. It aims to increase the percent of trips made by public transport from 14% to 25% by the year 2025 (10) through implementing projects that improve the level of service (LOS) of transit systems and increase their attractiveness. This goes in line with the Jordanian environment and sustainable transport strategies which are mainly focused on emissions, traffic volumes reduction and energy consumption.

While e-mobility is not systematically embedded in national strategies, section 2.6 of the Ministry of Energy and Mineral Resources (MEMR)'s Master Strategy for Energy (2030) mentions 4 key project/policy priorities in e-mobility, namely: EVs charging station establishment, incentives to encourage EVs, increasing EVs in public sector fleets, and increasing investment in electric public transport vehicles. The Ministry of Transport (MoT)'s Long-term National Transport Strategy merely mentions EVs or hybrid vehicles on p.105 stating "the promotion of alternative fuels and vehicles [...] should also be taken into consideration" with no specific policies or frameworks described. The Ministry of Environment (MoE)'s Green Growth National Action Plan (2021-2025) sets national and sectoral targets for 6 green growth sectors detailing seven e-mobility opportunities. Although the Green Growth National Action Plans is a step in the right direction, institutional coordination mechanisms remain weak. Sector ministries often lack the basic understanding of donor programs and demonstrate weak ownership of results.

## **4 BRIEF PROFILE OF THE CITIES**

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The project will support the implementation of electric bus development in Petra in close collaboration with Petra Development and Tourism Region Authority (PDTRA).

Petra is located 240 km south of the Jordanian capital Amman and 120 km north of the Red Sea coastal town of Aqaba and it is undoubtedly Jordan's most valuable treasure and greatest tourist attraction. The city of Petra was the capital city of the Nabataean Arabs, and it is one of the most famous archaeological sites in the world where it was described by the UNESCO as "one of the most precious cultural properties of man's cultural heritage". It was also recognized in 2007 as one of the new Seven Wonders of the World. The numbers of tourists visiting Petra has witnessed continuous growth up to the year 2020, when pandemic the started. Detailed cities baseline is included within the text of the Request for CEO Endorsement.

## **5 TECHNOLOGY INTERVENTIONS OF THE PROJECT**

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The project will provide technical assistance to the electric bus infrastructure investment project in Petra.

Initially, four potential e-mobility initiatives with catalytic potential were identified and investigated during the project's preparation stage in partnership with officials from ministries, municipalities, and other key stakeholders. The primary projects were public transport projects in Amman, Irbid/Zarqa, and Aqaba, as well as the tourism transport project in Petra. After multiple dialogues, meetings, and a multi-criteria evaluation of the possible initiatives' benefits, the "Petra E-bus project" was prioritized. Due to its major contribution to the national economy in Jordan the tourism sector is a sector with the potential to trigger a transformational change towards greening its operations, including transportation.

The GEF project will thus support the PDTRA's development project to green the transport route for tourists and locals. It will facilitate tourists transport from the archaeological park to the cultural village in the Little Petra area, and then to the hotels or the tourist bus station in the city of Petra. The "Petra E-bus project" will reduce GHG emissions urbanization pressures and generating social benefits such as boosting visitor accessibility, new employment opportunities and expanded access to transport services.

Further details on each of the pilots are highlighted in the project document.

## **5.1 DESCRIPTION OF THE PETRA E-BUS PROJECT**

The project will support the implementation e-bus transportation system including renewable energy and charging station implementation. The Project will support greening transport route for tourists visiting the Petra UNESCO World Heritage Site. It will provide affordable, reliable and convenient transportation for national and international tourists visiting the archaeological park and cultural village, and then to the hotels and/or the tourist bus station in the city of Petra. The “Petra E-bus project” will boost visitor accessibility while also alleviating urbanization pressures and generating some benefits such as employment opportunities and expanded access to transport services. The integration of RE-EV in energy & transport system will contribute the GHG emission reduction targets of Jordan.

Please refer to the project document attached.

## **5.2 ASSESSMENT OF THE E&S RISKS OF THE TECHNOLOGY DEMONSTRATION PROJECTS**

A rapid assessment of the key E&S issues in respect of the technology demonstration projects has been presented here. The purpose of the present summary assessment is to provide necessary direction to additional safeguards and mitigation measures for protection of the environment that may need to be considered in accordance to GEF Policy on Agency Minimum Standards on Environmental and Social Safeguards, UNIDO ESSPP Equator Principles and other international benchmarks in addition to the requirements under the national regulatory framework applicable to these projects.

The assessment recognizes the fact that initiating these clean energy projects as per international best practices in the selected cities will result in significant improvement in the prevailing baseline environmental and socio-economic scenario. The impact identification process has been done through detailing out the project activities to be undertaken as part of the technology demonstration projects in the selected cities and identifying their interactions with the environmental and social resources and receptors based on scientific understanding and professional judgement. Accordingly, the interactions between projects activities and E&S elements have been mapped and presented in form of interactions matrices separately for demonstration projects in the matrix below. The matrices is presented below in different parts, installation/construction of charging stations and other infrastructure, operation of e-bus transport route and after the long-term project life-time.

Environmental and Social Management Plan (ESMP)

Project Activities	Impact															
	Ambient Air Quality	Noise	Water Resources	Surface Water Quality	Ground Water Quality	Soil Quality	Surrounding Land use	Topography and Drainage	Climate Change	Terrestrial Ecology	Visual Amenity / Aesthetics	Physical Displacement	Economic Displacement, Employment	Vulnerable Groups	Public Health (including nuisance)	Occupational health & safety
<b>Construction Phase</b>																
Land development and site preparation, installation and commissioning of the technology			#	#	#					#						
Transportation of construction materials, machineries																
Operation of machinery and equipment																
Waste generation, treatment and disposal			#	#	#	#										
Workforce engagement													++	+++		
<b>Operational Phase</b>																
Operation of charging station, e-bus and PV panels		++							++		+++		++	++	++	
Workforce engagement													++	++		
<b>Abandonment (After productive life)</b>		++							++				+++		+++	



*an interaction is not reasonably expected*



*an interaction is reasonably possible but none of the resulting impacts are likely to lead to significant effects i.e. can be managed using industry standard mitigation measures*



*the interaction is reasonably possible and at least one of the resulting impacts is likely to lead to an effect that is significant i.e. requiring specific mitigation measures*



*positive impact, benefits*



*requires additional information / assessment*



*requires study - potential for positive benefits to be included in project*

## 6 CLIMATE RISKS SCREENING

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### 6.1 SENSITIVITY TO CLIMATE CHANGE, AND ITS IMPACTS

*Details of the historical (past to current) and the range of projected future climatic conditions in the project location.*

The National Adaptation Plan of Jordan indicates the climate change-related hazards in country (e.g.; droughts, floods, heat waves, cold waves, increasing temperature, and increasing aridity) through an analysis of past extreme events and trends, and through climate modelling and downscaling of future climate and environmental conditions, against various scenarios.

Based on long historical data obtained from Ministry of Water and Irrigation (MWI) and Jordanian Meteorology Department (JMD), climatic variables are changing significantly at both national and station level indicating that climate change is becoming more apparent. Both Mann-Kendall rank trend test and linear regression trends indicated that the annual precipitation tends to decrease significantly by time in a rate of 1.2 mm per year until 2100. On the contrary, the mean, maximum and minimum air temperature tends to increase significantly by 0.02, 0.01, and 0.03 °C/year, respectively. Dynamic downscaling was undertaken using Africa (Coordinated Regional Climate Downscaling Experiment (CORDEX) Domain, in which 43 grid points with 50 km resolution were crossed throughout the country.

Flooding has caused serious implications in the last years where lives have been lost, and several square kilometers of agricultural lands were destroyed in addition to severe damage to the infrastructure. Landslides and erosion problems have occurred as well, and they were concentrated on the steep slopes of mountains and wadis.

Although Petra is dry during most of the year, an average of 20-day rainfall period every year combined with the steep incline from the Al Shara Mountains down to the low plains of Wadi Araba presents a serious flood risk. The dry river beds with near-vertical sides increase the risk for visitors and to monuments. Furthermore, the most risky time for flooding between November and March is also a busy time for tourism. Historical evidence shows that there has been severe floods in 1963 and 1991. More recently, a flash flooding in April 2018 led to the emergency evacuation of thousands of visitors at short notice.<sup>1</sup>

There will be informative stickers in e-buses to warn passengers travelling to Petra give attention to flash flooding early warning system (sirens) especially between in November and March during their visit in the heritage site conditional to the acceptance and support of the local authorities.

*Information on the overall vulnerability (the product of exposure, sensitivity and adaptive capacity) of targeted natural resources in the project area to climate change.*

Jordan is characterized by dry to semi-dry climate conditions with an annual precipitation that falls under 50 millimeters in most areas. Jordan faces several challenges with the need to import of 98% of its energy; while severe aridity and water scarcity make it environmentally sensitive to climate change. Climate-related hazards are affecting Jordan, such as extreme temperatures, droughts, flash floods, storms, and landslides. These hazards are increasing in frequency and intensity due to climate change. Climate change affects various sectors including agricultural, coastal areas, biodiversity, urban systems, society, water, and health sectors, where adaptation options are required to mitigate its effects.

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<sup>1</sup> UNESCO [Petra World Heritage Site Integrated Management Plan](#)



The increase in the net irrigation requirements and the reduction in crop yield would result in reducing water use efficiency (WUE). The 1°C increase and the 10% decrease in precipitation would result in decreasing the WUE for all crops planted in Jordan. The decrease in WUE would range from 2% to 15%, with an average of 9%. An increase in temperature by 2°C and a decrease in precipitation by 20% in 2050 would worsen the situation and would reduce the average WUE by 17%.

In terms of drought, several studies had proven the increase incidence of drought events in Jordan. Literature indicates that the country will face frequent non-uniform drought periods in an irregular repetitive manner. Drought severity, magnitudes and lifespan will increase with time shifting from normal to extreme levels. The generated maps indicated the presence of two drought types, local drought acting on one or more geographical climatic parts and national drought, of less common but more severe, that extends over the whole country.

*Information on the vulnerability and exposure of the local communities in the project area to a changing climate.*

The impact of climate induced hazards in Jordan, particularly reduced precipitation, are unevenly distributed, where the rural poor will be disproportionately affected because of their greater dependence on agriculture, their relatively lower ability to adapt, and the high share of income they spend on food. Climate impacts could therefore undermine progress that has been made in poverty reduction and adversely impact the economic growth in vulnerable rural areas. In addition, it will affect food security and specifically quality, quantity and the accessibility to food resources leading to food insecure communities. The expected impacts of climate change, particularly reduced agricultural productivity and water availability threaten livelihoods options that depend on natural resource management and keep vulnerable people insecure. Poor families and households are the most vulnerable group to the impacts of climate change and deserve the priority the in design of appropriate adaptive measures.

*Details on how climate and non-climate stressors might interact to exacerbate climate risks.*

The main climate related hazards to the urban sector are represented by severe wind, increased urban temperature (Urban Heat Island effect - UHI), heavy rainfall and drought events. Vulnerabilities increase when infrastructure utilities and systems are subject to multiple stresses, beyond climate change alone; especially for those that are located in areas vulnerable to extreme weather events, as well as areas stressed by age and those near particularly climate-sensitive environmental features, such as coastlines, rivers, storm tracks and vegetation.

## **6.2 PROJECT'S OBJECTIVES AND OUTPUTS SENSITIVITY TO CLIMATE RISKS**

The high-risk climate hazards in Jordan include; river flood, landslide, water scarcity, extreme heat, and wildfire.

These hazards are increasing in frequency and intensity year by year due to climate change. The impact of climate change will certainly affects many sectors including agricultural, coastal, biodiversity, urban, society, water, and health sectors. (<sup>2</sup> NAP, 2021). Aridity and water scarcity render the country highly sensitive to climate change (WB).

All models predict a warmer climate with strong confidence e to increase in temperature. In 2070-2100, average temperature increase could reach +2.1°C [+1.7 to +3.1°C] under the RCP 4.5 scenario, and +4°C [3.8- 5.1°C] under RCP 8.5. Figures below present the results for the mean, minimum and maximum annual temperature, for the three -time horizons considered and under RCP 4.5 and 8.5 scenarios. In addition, the dynamic projections predict a drier climate with medium confidence. In 2070-2100, the cumulated precipitation could decrease by 15% [-6% to -25%] using RCP 4.5 scenario and by – 21% [-9% to -35%] under RCP 8.5. The decrease would be more marked in the western part of the country where the project activities will take place (NAP, 2021).

Climate change is expected to increase temperatures and change precipitation patterns, decreasing surface water availability and, acting on top of other stresses, increase water scarcity in the country (WHO). The country has already scarce water resources compared to the other countries in the Middle East since the water resources are depending mainly on precipitation

None of the proposed interventions of the project contribute to an increase of vulnerability and climate risk or lead to maladaptation, and measures for preventing this.

## **6.3 RESILIENCE PRACTICES AND MEASURES TO ADDRESS PROJECTED CLIMATE RISKS AND IMPACTS**

The climate induced risks will be mitigated particularly those related to the charging infrastructure by ensuring that this infrastructure meets current international standards (see Component 2) and – where applicable – contracting will also include a clause on resilience to climate impacts. Project planning decisions, project design, and construction methods will take into account of the on-site implications of these climate hazards. The risks associated with climate change include extreme weather conditions will be addressed by ensuring that any infrastructure investment supported by the project is climate-proofed.

The incorporation of new technologies and activities demands specialized skills and knowledge. Local and regional capacities must be created and/or improved to face the challenges posed by the modernization of transport and energy systems in view of increasing resilience to climate changes. Although the project focus area is been supported by some capacity building initiatives, important knowledge gaps and barriers to institutional effectiveness remain, including lack of coordination, which often hinder effectiveness.

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<sup>2</sup> The National Climate Change Adaptation Plan of Jordan, Final Draft, 2021

## 7 ENVIRONMENTAL AND SOCIAL RISKS AND MITIGATION MEASURES

This section describes relevant environmental and social risks identified during the project preparation period. Since ESMP should serve as an active tool, additional risks that are identified during the project implementation will be included as they are identified

	E&S risks	Mitigating measures	Location	Timeline, including frequency, start and end date	Responsibility	Cost of Mitigation (If Substantial; to be covered by project financing)
<b>Risks identified during the project screening and verified during the project preparation or inception</b>	<p>Health risks related to Covid-19 pandemic and its impact on:</p> <ul style="list-style-type: none"> <li>- Working arrangements</li> <li>- Restrictions on face-to-face meetings</li> <li>- National and international travel restrictions</li> <li>- Government priorities shift</li> </ul>	<p>The tourism sector will stay as one of most vulnerable sectors to COVID-19 travel restrictions and social distancing rules due its human dependence. The number of visitors to Petra in 2020 decreased to 252,728 from more than 1 million visitors in 2019 due to the restrictions imposed to contain the Covid-19 virus. The city was closed in March 2020. The pandemic hit the Jordanian tourism sector, which was contributing between 12% to 14% of the GDP, and tourism income decreased from 5.8 billion dollars in 2019 to one billion in 2020, according to official figures. Due to the pandemic lockdowns, all public transport services were</p>	Global	During project implementation	PEE/PMU	The cost of mitigation is not substantial. The costs are earmarked across the budget of all the project activities.

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		<p>stopped for about than 3 months. The Land Transport Regulatory Authority later resumed operations in July 2020 but dropped capacity to 50%; however, in April 2021 the capacity was increased to 75%. Starting from July 1<sup>st</sup> 2021, full capacity of operation returned as the second phase of the government's plan to reopen all sectors entered into force.</p> <p>The project will fully consider the negative implications of COVID-19 and identify the most appropriate ways to conduct implementation by using safety measures and preventive precautionary procedures. Such as organizing virtual meetings and trainings where face-to-face meetings bear health risks. The project team will be in continuous consultations with the governmental project stakeholders on how COVID-19 could impact the implementation of project activities and additional challenges that may subsequently arise due to the national pandemic restrictions. That would be pinned in the project schedule to accommodate to the prolongation of activities implementation and mobilization challenges during the pandemic period. The project team will follow national government's</p>				
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*Environmental and Social Management Plan (ESMP)*

	<p>and WHO’s recommendations on the use of social distancing and personal protective equipment, and vaccinations.</p> <p>See UNIDO’s <a href="#">COVID-19 Response</a> for further details.</p>				
<p>Climate change risks - Infrastructure developed is vulnerable to climate risks.</p>	<p>The climate induced risks will be mitigated especially those related to charging infrastructure by ensuring that this infrastructure meets current international standards (see Component 2) and – where applicable – contracting will also include a clause on resilience to climate impacts.</p> <p>Project planning decisions, project design, and construction methods will take into account on-site implications of these climate hazards. The risks associated with climate change include extreme weather conditions, which will be addressed by ensuring that any infrastructure investment supported by the project is climate-proofed. For instance, the location of technologies (e.g., charging stations) will take into consideration flood risks.</p>	<p>Jordan</p>	<p>During project implementation</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are earmarked in all the project activities.</p>
<p>Social risk related to loss of livelihood.</p> <p>The loss of jobs and income of local taxi and bus drivers due to deployment of e-bus routes</p>	<p>The project will promote local employment (e.g., e-bus drivers) however mainstreamed use of HOV could be risk of losing livelihood for taxi drivers. This risk will be</p>	<p>Petra, Jordan</p>	<p>Before the start of the implementation of Petra e-bus project</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are</p>

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	<p>investigated through stakeholder consultation with local associations, sector representatives, governmental partners before the implementation of Petra e-bus project (year 1). Detailed suitable mitigation measures will be assessed and reflected in this ESMP. These measures can include compensation for livelihood lose, (e.g., livelihood and income diversification training, re-skilling and access to new job opportunities, recommendations on monetary compensation (tbc) ).</p>				<p>earmarked in the project activities budget under the Component 2.</p>
<p>Environmental and social risks (incl. worker safety) during the construction and operational phase of Petra e-bus project.</p> <p>Identified adverse effects of the project during the construction phase may include:</p> <ul style="list-style-type: none"> <li>Disturbance to traffic: the proposed interventions may involve road cuttings, excavations of trenches, temporary road closures/lane closures, and vehicle and pedestrian traffic deviations. These could result in traffic congestion and may increase the potential risk of accidents particularly for local population.</li> </ul>	<ul style="list-style-type: none"> <li>The impacts of construction are expected to be temporarily. The potential impact of the operation will be minor.</li> <li>The project will comply with the requirements of the relevant national regulations such as the below but not limited to: <ul style="list-style-type: none"> <li>Regulation for the licensing and permitting of excavation and infrastructure network projects (No. 112/2007).</li> <li>The Regulation for the Prevention of Health Nuisances No. 8/2014</li> </ul> </li> </ul>	<p>Petra, Jordan</p>	<p>During the implementation of Petra e-bus project</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are earmarked in the project activities budget under the Component 2.</p>

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<ul style="list-style-type: none"> <li>• Local air quality problems: emissions and particular matter (PM) from the use of machines and dust production while grading excavating could result in annoyance to nearby residents and pedestrians and/or disturb nearby activities.</li> <li>• Noise generation: the use of excavation machines and construction equipment could potentially impact on workers and neighbourhood residents.</li> <li>• Impact on biodiversity: The impact of the construction to local biodiversity may be caused by:             <ul style="list-style-type: none"> <li>○ the noise impacting animals,</li> <li>○ accidental kill of wildlife,</li> <li>○ temporary clearance of vegetation of local landscape, accumulation of cut and fill materials,</li> <li>○ blocking the intermittent streams and 'wadi's during the rain/flood season.</li> </ul> </li> <li>• Worker Safety: Excavations and other construction site activities must be effectively managed to prevent injury to workers and disruption of the project</li> <li>• Electrical risks: Although EVs are generally safe if precautions and safety</li> </ul>	<ul style="list-style-type: none"> <li>- Jordanian Standards for the Prevention and Elimination of Noise (2003)</li> <li>- Traffic Law No. 49</li> <li>- Jordanian Labour Law No. (8)</li> <li>- Air Protection By-law</li> <li>- Soil Protection Regulation NO. 25/2005</li> </ul> <p>When the Petra e-bus project becomes operational busses without exhaust emissions will reduce air pollutants and particular matter thus improve public health.</p> <p>Even though the project will not directly procure equipment, technical assistance will be provided for the demonstration project (e.g., procurement plan, feasibility studies) and will consider equipment safety and quality certificates guided by UNIDO procurement policies and the best international experience on construction and operation as well as national regulations. The trainings on operating and maintenance of EVs will include health and safety measures (e.g., electrical safety).</p>				
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*Environmental and Social Management Plan (ESMP)*

<p>guidelines are followed, they do represent risks of electroshock, leakage of electrolyte chemicals from batteries, fire in certain situations such as accidents.</p>					
<p>Environmental impact from disposal of EV's batteries</p>	<p>Environmental laws and regulations can mitigate the environmental effects from EV's batteries. The project will incorporate dimensions on the end-use battery management into project interventions particularly in policy related activities under Component 2 and training activities under Component 3.</p> <p>The project components address the problem of sustainability considering local ecosystems, so the realization of the project should effectively decrease the risk of environmental degradation.</p>	<p>Jordan</p>	<p>After the project implementation when the batteries of EVs reach to their end-life</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are considered in the activities budget of the project activities under the Component 1 and Component 3.</p>
<p>Social Impact of High Occupancy Vehicles (HOVs) on vulnerable groups.</p> <p>Vulnerable groups (e.g., women and people with disabilities) may not equally benefit from HOVs. For instance HOVs may possess increased risk of sexual harassment for women and unequal access for people with disabilities (e.g., no barrier free access).</p>	<p>. Component 2 seeks to address these risks directly through the provision of recommendations on clarifying HOV licensing and requirements, in addition to addressing the need for viable bus routes. Consultations with vulnerable groups (women, refugees, the disabled, poor and elderly) will be sought when preparing policy recommendations under Component 2. Similar consultations will be held on the</p>	<p>Jordan</p>	<p>During the implementation of Petra e-bus project</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are considered in the activities budget of the project activities under the</p>



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	<p>placement of e-chargers, and findings from the consultations will be integrated into the Petra e-bus project (e.g., adequate lighting at the e-charging station, bus station, on-board, security cameras and barrier free access to the buses).</p>				<p>Component 2.</p>
<p>Project interventions' potential adverse impacts of the on women due to low representation/participation from women in positions of power and influence on the transport policy.</p> <p>See Project's Gender Plan for Electric Mobility.</p>	<p>This risk will be mitigated through ensuring that the women will equally benefit from project's interventions. These mitigation measures are given in the project's Gender Analysis and Action Plan. The project will specifically target women involved in the transport and tourism sector, local NGOs and associations working on women empowerment to include them in consultations on policy improvements under Component 1, and for safety and technical desing considerations under Component 2. Female transportation engineers and experts have been identified at the University of Jordan and other research institutions, and they will be actively requested to recommend additional colleagues as needed – thereby lessening the chances of invisibility amongst qualified female technicians. Disaggregated data on gender participation will be collected at all meetings and other events related to the project (e.g., Global Programme events), and targeted invitations will be made for enhanced female participation as</p>	<p>Jordan</p>	<p>During project implementation</p>	<p>PEE/PMU</p>	<p>The cost of mitigation is not substantial. The costs are considered in the activities budget of the project activities under the Component 1 and the Component 2.</p>

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		<p>needed. The project will follow thorough gender responsive communication and ensure stakeholder involvement at all levels, with special regard to involving women and men, as well as civil society and non-governmental organizations promoting gender equality. The project team will collect and compile qualitative and quantitative gender-disaggregated data from the industries and from authorities along project implementation in order to better inform the policy instruments and apply gender mainstreaming based on the findings as well as developing workshops to include NGOs as well as with business associations.</p>				
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## **8 ENVIRONMENTAL AND SOCIAL MANAGEMENT AND MONITORING**

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### **8.1 PLANNED MONITORING OF IDENTIFIED RISKS**

The monitoring of the identified risks will be organized through stakeholder consultations, meetings, site visits, and mitigation measures will be adopted accordingly.

## **9 ESMP ROLES**

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### **9.1.1 UNIDO Project Manager**

The Project Manager has overall responsibility for the compliance with ESMP related GEF/UNIDO policies.

### **9.1.2 Project Team (PMU/PEE)**

The project team is responsible for:

- Implementing the ESMP and relevant E&S risk mitigation activities.
- Identifying additional new risks during the project implementation, develop mitigation measures and update ESMP (please note that the ESMP is a living document)
- Conducting and providing evidence of effective consultation (i.e., consultation that is free, prior and informed) with communities likely to be affected by environmental and social impacts, and with local stakeholders, and also for ensuring broad community support.
- Overseeing environmental and social assessment studies that need to be undertaken prior to project appraisal. These studies will identify and assesses the potential opportunities for, risks to, and impacts on biological diversity and ecosystem services, including direct, indirect, cumulative and pre-mitigation impacts.
- Applying the mitigation hierarchy: to avoid potentially adverse impacts; if avoidance is not possible, to reduce and minimize potential adverse impacts; if reduction or minimization is not sufficient, to mitigate and/or restore; and as a last resort to compensate for and offset.
- Screening early for the possibility of involuntary resettlement, presence of indigenous people in the project area.

### **9.1.3 Gender Consultant (tbc)**

- Assist with integrating gender and other results frameworks, social safeguards, indicators and related monitoring and results tracking systems
- Develop guidelines for mainstreaming gender issues into strategy development to enable planning and policy formulation
- Facilitate the involvement of women in project activities
- Prepare surveys and reports addressing gender issues within the project
- Design and implement gender responsive communication for project implementation
- Contribute to creation of awareness raising materials that reflect gender issues
- Preferably a local expert

## **9.2 MONITORING AND EVALUATION PLAN**

The overall objective of environmental and social monitoring is to ensure that mitigation measures are implemented and that they are effective. Environmental and social monitoring will also enable response to new and developing issues of concern. The activities and indicators that have been recommended for monitoring are presented in the ESMP.

Environmental monitoring will be carried out to ensure that all project activities comply and adhere to environmental provisions and standard specifications, so that all mitigation measures are implemented.

Monitoring and evaluation will help keep track of the implementation of risk mitigation actions and assess their effectiveness and outcomes. Monitoring and evaluation is crucial to help project execution entity to adjust actions in case the activity being implemented is veering off course. It can support management under uncertainty, as well as learning

*Environmental and Social Management Plan (ESMP)*

and exchange about what risk mitigation actions works well and what does not. Further on the monitoring and evaluation offers accountability by transparently demonstrating and reporting on results

Monitoring should be undertaken at several levels.

- 1) **Monitoring by the Contractor** at work sites during construction under the direction and guidance of the Site Manager.
- 2) **Internal Monitoring:** It is the responsibility of the Project Team to conduct regular internal monitoring of the project to audit direct implementation of environmental mitigation measures contained in the ESMP. Their Project team should include an impact assessment specialist as well as a sociologist experienced with gender issues.
- 3) **Waste Management Monitoring:** The Contractor and Site-manager shall regularly monitor the management of wastes.
- 4) **External Monitoring and Evaluation:** A consultant may be hired to carry out Annual Environmental Audits in line with national and GEF/UNIDO requirements. At the minimum, a mid-term review and final evaluation should take place to evaluate the project – including its compliance with the ESMP. Annual reporting can be carried out directly by the Project Team. The Project Team will provide UNIDO with reports on environmental compliance during implementation as part of their annual progress reports and annual environmental auditing reports.

The project affected persons should be represented through public participation forums to be held during the project.

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	<b>E&amp;S risks</b>	<b>Parameters to be measured</b>	<b>Monitoring methods and procedures used (e.g. sampling)</b>	<b>Timing/Frequency of measurement</b>	<b>Detection limit</b>	<b>Sampling/monitoring location</b>	<b>Responsibility</b>
<b>Risks identified during the project screening and verified during the project preparation or inception</b>	Health risks related to Covid-19 pandemic	Health risk level (e.g., increase in COVID-19 cases, traffic light system) based on government, WHO, UNDESA regulations, guidance and recommendations	The project team will continuously monitor COVID-19 cases and assess the situation through consultation with the stakeholder Ministries (e.g., discuss the updates on the health risks in the first five minutes of each meeting)	Continuous during the project implementation	Based on national risk level	Petra and national level where relevant	PMU/PEE
	Climate change risks - Infrastructure developed is vulnerable to climate risks.	The risk level of location specific climate change induced hazards (e.g., flash floods)	Monitoring whether the climate change risk mitigation measures (e.g., location selection) are incorporated into the technology demonstration designs and procurement plan	Continuous during the project implementation	n/a	Petra and national level where relevant	PMU/PEE
	Social risk related to loss of livelihood.	Local population in Petra losing jobs, income	Stakeholder consultation with local representatives	The risks will be assessed before the implementation of Petra e-bus project, monitoring every 3 months	5% of local population (tbc) lost their jobs or income due to e-bus transport route	Petra and surrounding villages	PMU/PEE
	Environmental and social risks (incl. worker	The work safety risks with special	Review the work safety risk measures integrated into technical design of technology installations	Continuous during the project installation & construction (e.g.,	n/a	Petra	PMU/PEE

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	safety) during the construction and operational phase of Petra e-bus project.	attention to electroshock	(e.g., charging point installation), procurement plan (i.e., equipment with safety certification) as well as technical trainings to PDTRA	bi-weekly) and operation of Petra e-bus project			
	Environmental impact from disposal of EV's batteries	Assessment before MTR and TE since this is a future impact.	Stakeholder consultations with policy makers and EV experts	MTR and TE	n/a	Jordan	PMU/PEE
	Social Impact of High Occupancy Vehicles (HOVs) on vulnerable groups.	Gender and vulnerable group disaggregated data and level of contribution and attendance of women and youth project stakeholders in project activities and decision making	Collecting quantitative and qualitative (stakeholder consultations) disaggregated data	Continuous during the project implementation	n/a	Petra	PMU/PEE
	Project interventions' potential adverse impacts of the on women	Assess the impact on women through consultation with women association and gender experts	Stakeholder consultations and qualitative data, surveys	Continuous during the project implementation (e.g., every 4 months)	n/a	Petra	PMU/PEE

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<b>Additional risks identified during the project implementation</b>							

### **9.3 INSTITUTIONAL STRENGTHENING AND CAPACITY DEVELOPMENT**

Implementation of, and adherence to ESMP, is the responsibility of every member of the project team. All project personnel will be provided the requisite training and orientation/induction to enable their active and informed participation in the ESMP. Capacity building measures will be required to ensure that stakeholders involved in developing and implementing the various ESMP components have the technical, management and other skills to fulfil their roles.

HACT capacity assessment of the project execution entity (GGGI) conducted by UNIDO found that the entity has sufficient capacity and internal procedures to implement the ESMP throughout the project. Furthermore, the GGGI has a dedicated backstopping team based in their HQ who has expertise on the topic. The ESMP will be part of the terms of reference of the contractual agreement between UNIDO and GGGI.

### **9.4 COMMUNICATION**

UNIDO will annually communicate implementation progress on issues that involve ongoing risk to or impacts on the project stakeholders, and on issues that the consultation process or grievance mechanism has identified as of concern to those stakeholders. The ESMP will be disclosed on the UNIDO public website, under the following link: <https://open.unido.org/index.html>

The project team has consulted with the national stakeholders during the project preparation stage to ensure that the project and ESMP are in-line with national priorities and legal framework. Please see separate Stakeholder Engagement Plan (SEP) for further information.

All disclosures related inter alia to ESMP, mitigation plans, screening reports, results of all stakeholder consultations and other documents will be made available in a timely manner in a place accessible to key stakeholders.