

Energy Valley

ESIA for the Energy Valley Project Abu Qir Battery Energy Storage System

(Non-Technical Executive Summary)

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Executive Summary

1. Introduction

Energy Valley is an integrated renewable-energy and electricity-storage development comprising four geographically separate but financially and operationally linked components in Minya, Qena and Alexandria Governorates. The overall development includes: (i) the Minya Hybrid Facility, comprising a 1.95 GWp solar PV plant, a nameplate capacity of 1,500 MWh BESS, the on-site generation substation and associated grid-connection infrastructure; (ii) the Naseeg Saririya (Consumer) Substation and associated 500 kV grid connections in Minya Governorate; (iii) a nameplate capacity 1,000 MWh BESS at Nagaa Hammadi, together with a shared 33/220 kV substation and associated 220 kV loop-in/loop-out connection; and (iv) a nameplate capacity of 1,435 MWh BESS and 33/220 kV step-up substation at Abu Qir, with the external 220 kV grid connection which is an Associated Facility, as it will be under the responsibility of the Egyptian Electricity Transmission Company (EETC).

The four components form part of the same Energy Valley development and financing package but are assessed through separate site-specific ESIA's because of their different locations, receptors and risk profiles.

This ESIA addresses only Abu Qir BESS site. The remaining components are addressed in the corresponding Energy Valley ESIA's.

Energy Valley intends to develop a Battery Energy Storage System (BESS) with an installed nameplate storage capacity of approximately 1,435 MWh and a dispatchable AC capacity of 300 MW for 4 hours, together with a dedicated 33/500 kV step-up substation. The Project is located within the Abu Qir Power Plant premises in Alexandria Governorate on a land area of approximately 50,410 m².

The Project is designed to store electrical energy and discharge it to the national electricity grid, thereby supporting grid stability, load balancing, and the integration of renewable energy into the Egyptian electricity network. The Project forms part of the wider Energy Valley development portfolio, which includes renewable energy and energy storage facilities in several governorates across Egypt.

The Battery Energy Storage System will comprise approximately 201 containerized lithium-ion battery units, utilizing Lithium Iron Phosphate (LFP) battery technology. The Project will also include power conversion systems, cooling and ventilation systems, battery management systems, auxiliary facilities, and a dedicated step-up substation with an installed capacity of approximately 360 MVA.

The Project will be connected to the national electricity transmission network through an overhead transmission line (OHTL) to be developed by the Egyptian Electricity Transmission Company (EETC). A separate Environmental and Social Impact Assessment (ESIA) will be prepared for the OHTL in accordance with applicable national and lender requirements. Energy Valley will

coordinate with EETC and use its reasonable efforts to ensure that the OHTL assessment and implementation address applicable lender requirements.

Environics has been assigned by Energy Valley to prepare the Environmental and Social Impact Assessment (ESIA) for the Project in accordance with the requirements of the Egyptian Environmental Law No. 4 of 1994 and its amendments, as well as the environmental and social requirements of the international financing institutions, including the International Finance Corporation (IFC) Performance Standards, the European Bank for Reconstruction and Development (EBRD) Performance Requirements, and the African Development Bank (AfDB) Integrated Safeguards System.

Goals and Specific Objectives

The Project aims to support the stability, flexibility, and reliability of the national electricity grid through the deployment of a utility-scale Battery Energy Storage System (BESS). The Project will facilitate the integration of renewable energy into the national grid by storing electricity and discharging it in accordance with grid requirements, thereby supporting Egypt's renewable energy and decarbonization objectives.

The broad goal of the Environmental and Social Impact Assessment (ESIA) is to provide decision-makers, lenders, and project proponents with information on the potentially significant environmental and social impacts and risks associated with the proposed Abu Qir Battery Energy Storage System (BESS) Project and its associated infrastructure.

The specific objectives are:

- To identify the potential positive and negative environmental and social impacts associated with the construction, operation, and decommissioning phases of the Project.
- To propose appropriate mitigation and enhancement measures to avoid, minimize, mitigate, or compensate for adverse impacts and enhance potential benefits.
- To develop Environmental and Social Management and Monitoring Plans for implementation throughout the Project lifecycle.
- To ensure compliance with applicable Egyptian environmental and social legislation, Good International Industry Practice (GIIP), and the requirements of international financing institutions, including the IFC Performance Standards, EBRD Performance Requirements, and AfDB Integrated Safeguards System.

2. Institutional and Legal frameworks

This framework includes both national legislation and international standards and guidelines.

National Legislation

The project must comply with Egyptian environmental and social laws and regulations, including:

Environmental Impact Assessment (EIA): The national Environmental Law 4/1994 (as amended by Laws 9/2009 and 105/2015) and its Executive Regulations require an EIA study

for new projects. The EIA is to be submitted to the environmental authority for review and approval. According to the national regulations, this project is categorised under Category Scoped B projects.

Air Quality: Law 4/1994 and its associated regulations set maximum limits for ambient air pollutants and exhaust gases. The project will need to comply with these limits during both construction and operation.

Noise: Law 4/1994 and its regulations define permissible ambient and work noise levels.

Waste Management: The Waste Management Law 202/2020 and its Executive Regulations set requirements for managing non-hazardous and hazardous waste generated from the different activities.

Biodiversity Protection: Environmental Law No. 4 of 1994 includes provisions for the protection of biodiversity and protected species. The Project site is located within a previously disturbed industrial area and is not expected to affect natural or critical habitats.

Cultural Heritage: Law No. 117 of 1983 for the Protection of Antiquities, as amended, provides requirements for the protection of archaeological and cultural heritage resources.

Labor Law: Labour Law No. 14 of 2025 and other applicable regulations govern labour relations, working conditions, occupational health and safety, and workers' rights.

Community Investment: The Egyptian Investment Law 72/2017 encourages investors to contribute to social development initiatives, including environmental protection, healthcare, education, and research.

Institutional Framework

Several governmental entities have regulatory and oversight responsibilities for the project, including:

- Egyptian Environmental Affairs Agency (EEAA): Responsible for reviewing and approving the ESIA and monitoring environmental compliance.
- New and Renewable Energy Authority (NREA): Responsible for land allocation and oversight of renewable energy developments.
- Egyptian Electricity Transmission Company (EETC): Responsible for grid connection arrangements and electricity transmission infrastructure.
- Ministry of Electricity and Renewable Energy (MoERE): Provides strategic oversight of the electricity sector and renewable energy development.
- Ministry of Labour: Responsible for enforcement of labour and occupational health and safety requirements.
- Minya Governorate and Local Authorities: Responsible for local administrative coordination and permitting requirements.
- Ministry of Tourism and Antiquities (MOTA): Responsible for the protection of archaeological and cultural heritage resources.

International Standards and Guidelines

In addition to national legislation, the project will align with international standards and guidelines, particularly those of international financing institutions:

EBRD Performance Requirements: The project must adhere to the European Bank for Reconstruction and Development's (EBRD) Performance Requirements (PRs), including those related to environmental and social impact assessment, labor and working conditions, biodiversity conservation, and community health and safety.

African Development Bank Group's Operational Safeguards (AfDB OS): The project must also comply with the African Development Bank's (AfDB) Operational Safeguards, which cover similar areas as the EBRD ESRs.

International Finance Corporation (IFC) Performance Standards on Environmental and Social Sustainability: Including requirements related to labour and working conditions, resource efficiency and pollution prevention, community health and safety, and stakeholder engagement

World Bank EHS Guidelines: The World Bank Group's Environmental Health and Safety (EHS) Guidelines provide technical guidance on Good International Industry Practice (GIIP) for various sectors.

International Labour Organization (ILO) Conventions: The project will adhere to relevant ILO conventions, ensuring fair and safe working conditions, freedom of association, and the prevention of child and forced labor.

Scatec Corporate Sustainability, Environmental, Health, Safety and Social Requirements

The Project will be implemented in accordance with applicable Scatec corporate policies, standards, procedures, and commitments, in addition to Egyptian legislation, permit conditions, lender requirements, and relevant international standards. These requirements cover sustainability, environmental protection, occupational health and safety, labour and working conditions, human rights, responsible procurement, stakeholder engagement, and grievance management, and will apply to the Project Company, employees, contractors, subcontractors, suppliers, and other relevant parties. The applicable requirements will be integrated into the Project's E&S management system, ESMP, contractual and procurement arrangements, management plans, training, monitoring, incident reporting, audits, and corrective actions.

3. Project Description

Project components and main activities

The proposed project comprises three broad components as follows:

Battery Energy Storage System (BESS): The Project includes the installation and operation of a utility-scale Battery Energy Storage System (BESS) with an installed nameplate storage capacity of approximately 1,435 MWh and a dispatchable AC capacity of 300 MW for 4 hours. The BESS is expected to utilize Lithium Iron Phosphate (LFP) battery technology and will comprise approximately 201 containerized battery units. The system will include Battery

Management Systems (BMS), cooling and ventilation systems, power conversion systems (PCS), control and monitoring systems (SCADA), and associated auxiliary and safety systems.

Step-up substation: A dedicated 33/500 kV step-up substation will be constructed within the Project area to facilitate the import and export of electricity between the BESS and the national electricity grid. The substation is expected to have an installed capacity of approximately 360 MVA and will include transformers, switchgear, protection systems, and associated auxiliary equipment.

Connection to the grid: The Project will be connected to the national electricity transmission network through an overhead transmission line (OHTL) to be developed, operated, and maintained by the Egyptian Electricity Transmission Company (EETC). A separate Environmental and Social Impact Assessment (ESIA) will be prepared for the OHTL in accordance with applicable national and lender requirements.

Project location

The proposed Project is located within the Abu Qir Power Plant premises in Alexandria Governorate on a land area of approximately 50,410 m². The Project site is bordered by the Abu Qir Power Plant to the west, storage and scrap areas to the north, an agricultural drain and agricultural lands to the east, and the El Tabia–Rashid Road and Abu Qir railway line to the south.

The nearest residential area is Ezbet El Setin village, located approximately 100 m east of the Project Site. The Project site is situated on previously disturbed land that was formerly used as a fish farm and can be accessed directly through the existing road network serving the Abu Qir Power Plant.



Figure (1): Proposed Project Location

4. Baseline Conditions

Physical Environment:

- **Climate and Meteorology:**

The Project Site is located within the Mediterranean coastal climatic zone of Alexandria Governorate. The area is characterized by relatively moderate temperatures, high humidity, and seasonal rainfall concentrated during the winter months. Prevailing winds are predominantly northwesterly, with an annual average wind speed of approximately 25 km/h. The maximum average temperature reaches approximately 30°C during summer, while minimum temperatures may reach approximately 10°C during winter.

- **Air Quality:**

The Project Site is located within the Abu Qir Power Plant premises in an industrial setting. Air quality is influenced by nearby industrial activities, road traffic, and local climatic conditions. No significant air quality constraints were identified that would preclude the development of the Project.

Geology and Geomorphology:

- ✓ Geology and soil: The site consists of coastal sedimentary deposits typical of the Abu Qir area and is characterized by clayey soils in the low-lying sections.
- ✓ Topography: The Project Site is generally flat and low-lying, reflecting its previous use as a fish farm. Localized water accumulation and ponded areas are present within parts of the site.
- ✓ Surface water: The Mediterranean Sea is located approximately 180 m north of the Project Site, while Lake Idku is located approximately 2.2 km away. An agricultural drain runs along the eastern boundary of the Project Site. Project activities are not expected to result in direct interaction with surrounding surface water bodies.
- ✓ Ground Water: Groundwater is present within the wider coastal environment and was considered in the baseline assessment. Site preparation measures, including dewatering and ground improvement works, have been incorporated into the Project design where required.

Biological Environment:

- ✓ The Project Site is located within a previously disturbed area that was formerly used as a fish farm and is currently characterized by reed-dominated vegetation, localized standing water, and disturbed habitats. The ecological value of the site is considered low to moderate.
- ✓ Habitats: Habitats within the Project Site consist primarily of disturbed land, reed patches dominated by *Phragmites australis*, ponded areas, and previously modified terrain. No critical habitats or protected areas occur within the Project Site.
- ✓ Flora: Vegetation is limited and dominated by common and widespread species associated with disturbed habitats and seasonal wet areas.
- ✓ Fauna: No species of significant conservation importance were recorded within the Project Site during the field surveys. The site provides limited ecological value due to its disturbed nature and proximity to industrial activities.
- ✓ Avifauna: The wider area lies within a region crossed by migratory birds; however, the Project Site itself does not provide significant feeding, nesting, or roosting habitats. Given

the nature of the Project and the absence of overhead structures within the assessed Project scope, significant impacts on avifauna are not anticipated.

Socio-Economic Environment:

The Project Site is located within the Abu Qir industrial area and is surrounded by a mixture of industrial, agricultural, and transport infrastructure.

- ✓ Population and Settlements: The nearest residential area is Ezbet El Setin village, located approximately 100 m east of the Project Site.
- ✓ Economic Activities and Land Use: Surrounding land uses include the Abu Qir Power Plant, agricultural lands, an agricultural drain, transport infrastructure, and vacant land. The Project Site itself is located on previously disturbed land and no physical displacement or economic displacement is anticipated.
- ✓ Infrastructure and Services: The Project benefits from existing road access, electricity infrastructure, water supply, and wastewater services available within the Abu Qir area. The existing infrastructure is considered adequate to support Project construction and operation.
- ✓ Employment: Construction activities are expected to create temporary employment opportunities, while a limited permanent workforce will be required during operation. Preference will be given to local workers where suitable qualifications are available.

Tangible Cultural Heritage

According to the baseline assessment and review of available archaeological information, no registered archaeological sites, cultural heritage resources, or protected monuments are located within the Project Site. No impacts on known cultural heritage resources are anticipated.

Intangible Cultural Heritage

No intangible cultural heritage elements were identified within the Project Site. The Project is not expected to affect local cultural practices, traditions, or community cultural resources.

5. Analyses of Project Alternatives

The analysis of alternatives considered feasible project options during the conceptual and pre-feasibility design stages, taking into account technical, economic, environmental, and social considerations.

No Project Alternative: Under this alternative, the proposed BESS Project would not be developed. While this option would avoid the localized impacts associated with construction and operation activities, it would also prevent the realization of the Project's benefits, including enhanced grid stability, improved operational flexibility, and support for the integration of electricity into the national grid. Therefore, the no-project alternative was not considered suitable.

Site Location: The proposed Project is located within the Abu Qir Power Plant premises on previously modified land and in close proximity to the required electrical infrastructure. Given

the suitability of the site and its compatibility with the surrounding industrial setting, alternative site locations were not considered necessary.

BESS Alternatives: Several battery storage technologies were evaluated, including Lithium Iron Phosphate (LFP), Lithium Nickel Manganese Cobalt Oxide (NMC), Lithium Titanate (LTO), Vanadium Redox Flow Batteries (VRFB), molten metal batteries, and sodium-based batteries. Following the assessment, Lithium Iron Phosphate (LFP) technology was selected due to its high thermal stability, lower fire risk, long cycle life, favorable environmental risk profile, and suitability for utility-scale energy storage applications.

Cooling system alternatives: Alternative cooling technologies were assessed, including forced air-cooled systems, open-loop liquid cooling systems, closed-loop liquid cooling with water-based heat rejection, and closed-loop liquid cooling with air-based heat rejection. The selected option is a closed-loop liquid cooling system with air-based heat rejection (dry coolers), as it provides reliable thermal management while avoiding process water consumption, wastewater generation, and the operational complexities associated with water-based cooling systems.

6. Stakeholder Engagement Activities and Consultation

Stakeholder engagement has been undertaken as part of the ESIA process to ensure that relevant stakeholders are informed about the Project and provided with opportunities to raise questions, concerns, and recommendations.

Consultation activities were conducted with relevant governmental entities, local representatives, nearby communities, and other stakeholders located within the Project Area of Influence. The engagement process aimed to present Project information, discuss potential environmental and social impacts, and obtain stakeholder feedback.

The key issues raised during stakeholder engagement activities included employment opportunities, environmental management during construction, traffic and transportation issues, and community health and safety considerations. The Project team provided clarifications regarding Project activities, proposed mitigation measures, and the grievance mechanism available for stakeholders.

Stakeholder engagement will continue throughout the Project lifecycle through the implementation of the Stakeholder Engagement Plan (SEP) and the Project Grievance Mechanism, ensuring ongoing communication, transparency, and effective management of stakeholder concerns.

7. Assessment of Environmental and social Risks and Impacts

This chapter assesses the potential environmental and social impacts and risks associated with the construction, operation, and decommissioning phases of the Project. The assessment was undertaken in accordance with national regulatory requirements and international lender standards and considered both the impacts of the Project on environmental and social

receptors and the potential influence of environmental conditions on the Project. The assessment process followed the mitigation hierarchy, with emphasis on impact avoidance, minimization, mitigation, and management.

The Project is expected to generate a number of positive environmental and socio-economic benefits. These include supporting the stability and flexibility of the national electricity grid, facilitating the integration of renewable energy into the electricity network, reducing renewable energy curtailment, and enhancing the reliability of electricity supply. The Project will also create temporary employment opportunities during the construction phase and contribute to the development of technical skills and capacity in battery energy storage technologies.

Potential adverse impacts identified during the assessment are generally associated with construction activities, including air emissions, noise generation, waste management, occupational health and safety risks, traffic movement, and temporary disturbance of the existing site conditions. During operation, potential impacts are primarily related to occupational health and safety, hazardous materials and waste management, emergency situations including battery fire and thermal runaway events, and routine facility management activities. Appropriate mitigation and management measures have been identified to reduce these impacts to acceptable levels.

Summary of the potential negative impacts on the environment and society during the construction and operation phases of the project illustrated in table below.

Table 1: Summary of the potential negative impacts

Environmental Aspect	Expected risks and Impacts	Mitigation Measures Summary	Residual Impacts
Construction Phase			
Air Quality			
• Air Quality	MINOR	Implement policies to reduce idling, maintain machinery, impose site speed restrictions, ensure worker awareness of safe practices, and conduct periodic generator compliance measurements.	INSIGNIFICANT
Ambient Noise			
Equipment and machinery Vehicles Movement Power Generators	MINOR	Ensure regular maintenance, use low-noise machinery where possible, avoid simultaneous high-noise activities, and provide hearing protection for workers exposed to high noise levels.	INSIGNIFICANT
Impacts on Soil			
Domestic wastewater tanks, material and wastes storage, and accidental spills	MINOR	Conduct off-site maintenance, dispose of hazardous waste properly, and maintain good housekeeping. Ensure proper wastewater disposal and protect local wildlife. Use licensed contractors for waste management.	INSIGNIFICANT
Dewatering activities	Minor	Collect water generated from dewatering activities and transport it to an authorized public wastewater treatment plant for treatment and disposal.	INSIGNIFICANT
Risks and Impacts on the Biological Environment			
Habitat disruption, flora, fauna, and avifauna	INSIGNIFICANT	Develop, implement, and update a solid waste management plan to ensure environmentally sustainable waste management, preventing vermin and avifauna attraction.	No residual impact
Risks and Impacts on the Social Environment			
Water Resources	INSIGNIFICANT	A comprehensive water management plan will be developed	No residual impact
Worker Influx	Minor	Prioritize hiring local workers, implement and maintain a community grievance mechanism	INSIGNIFICANT
Infrastructure			
• Land use	INSIGNIFICANT	Obelisk has developed Transportation Management Procedures for project, operations, contractors, and subcontractors, defining minimum safety requirements that supplement national regulations and project specifications. Also, implementation of a traffic management plan for the construction phase is required.	No residual impact

Environmental Aspect	Expected risks and Impacts	Mitigation Measures Summary	Residual Impacts
• Traffic	MODERATE	Obelisk has developed Transportation Management Procedures for projects, operations, contractors, and subcontractors. These procedures define the minimum safety requirements for transportation activities, supplementing national regulations and project specifications.	MINOR
Occupational Health and Safety			
• Impacts on workforce health and safety	MODERATE	Surround excavation sites with warning signs and ensure continuous supervision of workers. Provide proper training, regular maintenance, hydration, shaded breaks, and enforce speed limits. Use PPE, inspect equipment, control noise, offer lifting training, and implement fire prevention measures.	MINOR
Operation Phase			
Air Quality			
• Emissions from emergency generator	MINOR	Optimize the operation of backup generators to reduce usage and emissions.	INSIGNIFICANT
Ambient Noise & Vibration			
Operation of Transformers, BESS Use of backup generators during power outages	MINOR	Noise-generating machines and equipment will comply with statutory regulations, and workers will be provided with appropriate PPE. A grievance mechanism will be established to handle complaints.	INSIGNIFICANT
Risk and Impact on the Social Environment			
• Water Resources	INSIGNIFICANT	Wastewater generated during the operation phase is minimal and will be collected by an approved contractor and discharged to designated treatment plants.	No residual impact
Risks and Impacts on Occupational Health and Safety			
• Impacts on workplace	Minor	A health and safety policy will be implemented, ensuring the provision of appropriate personal protective equipment (PPE) and an adequate supply of drinking water.	INSIGNIFICANT
• Potential fire and thermal runaway risks	Minor	Implement battery management and monitoring systems.	INSIGNIFICANT

These potential negative impacts and risks can be effectively mitigated through the implementation of appropriate measures outlined in the Environmental and Social Management Plan.

Cumulative Impacts

A cumulative impact assessment was undertaken in accordance with IFC Performance Standard 1 and relevant international good practice. The assessment considered potential cumulative effects that may arise from the interaction of the Project with existing and reasonably foreseeable developments within the Area of Influence, including potential effects related to air quality, traffic, waste management, water resources, biodiversity, and workforce influx.

The assessment concluded that Battery Energy Storage System (BESS) projects generally do not result in significant adverse environmental impacts during operation. Potential cumulative impacts are primarily associated with construction activities and are expected to be localized, temporary, and of limited magnitude. With the implementation of the proposed mitigation and management measures, the residual cumulative impacts are expected to be insignificant.

8. Environmental and Social Management Plan

The Project will develop and implement an Environmental and Social Management Plan (ESMP) to ensure that environmental and social risks and impacts are effectively managed throughout the Project lifecycle and that the Project remains compliant with applicable national legislation and international lender requirements.

The ESMP includes mitigation, monitoring, reporting, and management measures designed to avoid, minimize, and manage identified environmental and social impacts and risks.

The ESMP encompasses the following key components:

The Summary of Impacts and Mitigation Measures,

Environmental and Social Management Plans include the following:

- Construction Environmental and Social Management Plan (CESMP)
- Occupational Health and Safety (OHS) Management Plan
- Air Quality Management Plan
- Noise Management Plan
- Hazardous Waste Management Plan
- Solid Waste Management Plan
- Spill Prevention and Management Plan
- Emergency Response Plan
- Environmental Register and Compliance Management
- Preventive and Corrective Maintenance Procedures
- Stakeholder Engagement and Grievance Management Mechanism
- Decommissioning Planning Requirements

Institutional Arrangements:

Defined roles and responsibilities will be established for the implementation, monitoring, and reporting of the ESMP. The Project Company, contractors, subcontractors, and relevant authorities will have clearly assigned responsibilities to ensure effective environmental and social management throughout the Project lifecycle.

Capacity Building:

Training and awareness programs will be implemented to ensure that Project personnel and contractors are competent in applying environmental, social, health, and safety requirements. Training will cover occupational health and safety, waste management, emergency preparedness and response, hazardous materials handling, grievance management, and other relevant environmental and social topics.

Table 2: ESMP Plans During Construction

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
Ambient Air Quality	Dust emissions and gaseous pollutants from construction activities and vehicle machinery.	- Restrict unnecessary idling of vehicles and equipment. - Maintain construction machinery and vehicles in good working condition. - Cover trucks transporting friable materials. - Apply speed restrictions and good housekeeping measures - Conduct regular ambient air quality monitoring (PM10, PM2.5, NO2, SO2, CO)	Construction contractor	- Ambient air quality monitoring reports Maintenance logs	10,000 – 25,000/ year	Throughout the construction phase period
Noise	Noise generated from construction equipment and vehicles	- Maintain equipment regularly. - Schedule high-noise activities appropriately. - Provide workers with suitable hearing protection.	Construction contractor	Compliance with applicable noise limits; PPE usage Noise measurements and Maintenance logs	10,000 – 5,000 / year	Throughout the construction phase period
	Provision of PPEs	- Providing necessary PPE for workers	Construction contractor		20,000 – 10,000 (PPE supply - total project period)	

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
Soil	Soil disturbance and potential contamination	- Implement Spill Prevention Management Plan. - Maintain good housekeeping practices. - Store fuels and chemicals appropriately. - Collect and dispose of contaminated materials through licensed contractors.	Construction contractor Energy Valley (include provisions in the construction contracts. Energy Valley s to ensure contractors' compliance)	-Waste management plans - Solid/hazardous waste - No significant spills; contract - Contractor follow-up documents - Contracts with authorized waste contractors	6,000 – 20,000 (depends on waste volume)	Throughout the construction phase period
Surface Water and Dewatering	Dewatering activities and wastewater management	- Collect dewatering water and transport it to an authorized public wastewater treatment plant. - Prevent uncontrolled discharge to surrounding receptors.		Records of wastewater collection and disposal	5,000 – 15,000	
Occupational Health and Safety	Site Staff and Workplace Safety	- Developing OHS plan and HSE procedures according to national requirements and international standards	Contractor	OHS plan and procedures HSE provisions in the construction contracts	20,000 – 40,000	Before construction activities
Emergency Response plans	Site Staff and Workplace Safety	- Develop procedures for emergency control	Contractor	Emergency response plan	10,000 – 25,000	Before project commissioning
Waste management	Worker's health	- Developing a solid and hazardous waste management plans in line	Construction contractor	Solid waste management contract	10,000 – 30,000	Throughout the construction phase period

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase						
		with the WBG General EHS Guidelines." - Developing OHS plans - Different types of waste to be stored in designated waste areas, and transported by licensed contractors		with authorized contractors Waste manifest OHS plan		
Social Environment	Workers Influx Management	- Prioritize hiring local workers from nearby communities . - Implement and maintain a community grievance mechanism to address any concerns related to the workforce; - . - Develop HR policies including Code of Conduct, GBV and SEAH plans	Energy Valley /Construction contractors	– Workforce demographic reports (showing number and % of local vs. non-local workers). – Records of workers' places of origin and commuting status. – Labour management plan, Community grievance logs and resolution record	15,000 – 40,000/ year	Throughout the construction phase period
	Community health, safety and security Risks from road traffic accidents, increased traffic volume,	- Develop and implement Traffic Management Plan (TMP) and associated procedures. - Designate specific transport routes to avoid sensitive areas. - . - Conduct defensive driving and TMP safety training for all drivers.	Construction contractors	- Traffic Management Plan (TMP). - Traffic safety logs (records of accidents and near-misses). - Driver training records and vehicle inspection checklists.	10,000 – 25,000	Throughout the construction phase period

Aspect		Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required Completion Date
Construction Phase							
					- Community grievance logs related to traffic issues.		
		Cultural heritage	- develop chance find procedure	Energy Valley /Construction contractors	- Developed procedures	2,000 – 5,000	Before construction activities
		Stakeholder Engagement and Grievance Management	- Implement the overall Energy Valley SEP - Conduct regular consultation meetings. - Maintain an accessible Grievance Redress Mechanism (GRM) for both communities and workers to receive, track, and resolve concerns. - .	Energy Valley / Construction Contractor	- SEP Implementation Reports including: - Number of engagement activities conducted. - Total number of stakeholders engaged. - Gender-disaggregated data (number of men and women participants). - Grievance Logs and resolution records - Information disclosure records	10,000 – 20,000 / year	Throughout the construction phase period
Total Estimated Cost	(USD)		-			≈ 110,000 – 270,000 USD	
	(EGP)					≈ 5,500,000 – 13,500,000 EGP	

Table 3: Overview of ESMP Plans During Operation

Aspect	Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
Operation Phase						
Noise	Transformers and cooling equipment	- Provide workers at noise generating machinery and equipment will be provided with suitable (PPEs). - Maintain equipment is good operation conditions - A grievance mechanism will be adopted for assessing complaints,	Project Company	Noise measurements	5,000 – 10,000	Periodically throughout the operation stage
Hazard waste management	Hazard waste generated from maintenance activities	- Store hazardous waste in designated areas. - Dispose of hazardous waste through licensed contractors.	Project Company	Hazard waste register, waste manifest	5,000 – 10,000 USD/year	Periodically throughout the operation stage
Spill Prevention	Accidental releases of oils and hazard materials	- Implement Spill Prevention Management Plan. - Maintain spill response equipment and procedures.	Project Company	Number of spills and corrective actions implemented	2,000 – 5,000 USD/year	Periodically throughout the operation stage
Labour rights and welfare	working conditions	Develop Human Resources policy	Project Company	Contracts (with workers)	Included in OPEX (negligible direct ESMP cost)	Throughout the project lifetime
Training and Awareness	competence of the project personnel	training for the personnel according to their responsibilities	Project Company	Training plans	5,000 – 10,000/ year	Throughout the project lifetime
Occupational Health and Safety	Site Staff and Workplace Safety	- Developing HSE procedures - Implement OHS Management Plan. - Conduct periodic training and refresher programs. - Maintain incident reporting procedures	Project Company	Development of HSE policies OHS inspections and audits	8,000 – 15,000/ year	Throughout the project lifetime
Emergency Preparedness and Response; and Fire and Thermal Runway	Operational risk management	- Adopt a probabilistic risk assessment framework - Implement battery safety procedures.	Project Company	Emergency response plan	3,000 – 10,000/ year	Throughout the project lifetime

Aspect		Issues of concern	Actions	Party Implementing the Action	Indicator of completion	Estimated Cost (USD)	Required completion Date
			- Maintain fire detection and suppression systems. - Conduct emergency drills and response training				
Stakeholder Engagement and Grievance Management		- Stakeholder concerns, complaints and grievances	- Maintain the project grievance mechanism - Periodically review grievances trends and response	Project Company	- Number of grievances received, resolved and pending; response times	10,000 – 20,000/ year	Throughout the project lifetime
Total Estimated Cost	(USD)					≈ 38,000 – 80,000 USD / year	
	(EGP)					≈ 1,900,000 – 4,000,000 EGP / year	

Table 4: Overview of ESMP Plans During Decommissioning

Aspect	Issues of Concern	Actions	Party Implementing the Action	Indicator of Completion	Estimated Cost (USD)	Required Completion Date
Decommissioning Planning	Inadequate planning and coordination	Prepare and implement a Decommissioning Plan in accordance with Egyptian regulations, lender requirements, and GIIP.	(EETC/Energy Valley)	Approved Decommissioning Plan	10,000 – 20,000	Prior to decommissioning
Ambient Air Quality	Dust and air emissions from dismantling and demolition	Apply dust suppression measures and follow approved dismantling procedures.	Decommissioning Contractor	No significant dust complaints; monitoring records	5,000 – 10,000	Throughout decommissioning
Noise	Noise from demolition and equipment removal	Limit noisy activities, maintain equipment in a good working conditions , and provide PPE where required.	Decommissioning Contractor	Compliance with applicable noise requirements	3,000 – 8,000	Throughout decommissioning
Waste Management	Generation of hazardous and non-hazardous waste	Segregate, reuse/recycle where feasible, and dispose of wastes through licensed facilities.	Decommissioning Contractor	-Solid/hazardous waste and wastewater management contract -Contractor follow-up documents Contracts with authorized waste contractors	20,000 – 60,000 (depends largely on hazardous waste quantities and disposal requirements)	Throughout decommissioning
Occupational Health and Safety	Worker injuries during dismantling and demolition	Implement OHS procedures, provide PPE, training, and emergency preparedness.	Decommissioning Contractor	No major incidents; OHS inspection records	15,000 – 35,000	Throughout decommissioning
Site Restoration	Residual contamination and disturbed land	Remove remaining structures, clean up the site, remediate if required, and restore the site where feasible.	Decommissioning Contractor / Project Proponent	Site restoration completed and approved	20,000 – 50,000 (excluding major demolition or remediation works if required)	Before project closure
Monitoring and Reporting	Non-compliance with environmental and social requirements	Conduct regular inspections, monitoring, and reporting to verify implementation of the Decommissioning Plan.	Energy Valley / Supervising Engineer	Monitoring reports and close-out report	8,000 – 20,000	Throughout decommissioning and prior to project closure

Environmental and Social Monitoring Plan

The Project will implement an Environmental and Social Monitoring Program to verify compliance with applicable requirements and assess the effectiveness of mitigation measures. Monitoring activities will include, as applicable, air quality, noise, waste management, occupational health and safety performance, incident reporting, emergency preparedness, and the implementation of environmental and social management measures. Monitoring results and ESMP implementation status will be documented and periodically reported in accordance with applicable lender requirements.

Table 8-1: Environmental Monitoring Plan

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Construction phase								
Workplace	Noise measurements	Project site	Compliance of noise intensity with standards	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD ESR4; AfDB OS4; EIB ESS3	Measurement at two locations quarterly	All contractors and subcontractors, supervised by Energy valley	Third party (research entity or certified lab)	~10,000 EGP
	Ambient Air Quality and Dust	Project boundary	Compliance with air emission standards	Law No. 4/1994 (Annex 6); IFC/WBG General EHS Guidelines; EBRD ESR3; AfDB OS4; EIB ESS3	Measurement at two locations quarterly	All contractors and subcontractors, supervised by Energy valley	Third party (research entity or certified lab)	~ 35,000 EGP
	Spills	Fuel, oil and chemicals storage areas	Number of spill incidents, response actions and corrective measures	EHS Guidelines	Monthly and after incident	All contractors and subcontractors, supervised by Energy valley	contractors' EHS personnel	Included in salaries
	Waste management	Project site and waste storage areas	Proper management of the different types of waste	Waste Management Law No. 202/2020; Law No. 4/1994; IFC PS3; EBRD ESR3; AfDB OS4; EIB ESS3	Monthly	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company and contractors EHS personnel	200 – 600 EUR/ton (hazardous waste) 80 – 150 EUR/ton (non-hazardous)
	Wastewater management	Dewatering collection and storage location	Records of wastewater collection and disposal through authorized facilities		Throughout dewatering activities	All contractors and sub-contractors, supervised by Energy Valley company	contractor under Energy Valley Company supervision	10,000–30,000 USD

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Social management	Workers influx	Project site	- Number of community grievance - Percentage and number of local vs. non-local workers - Records of workers' places of origin and commuting status.	Egyptian Labour Law No. 14/2025; IFC PS2; EBRD ESR2; AfDB OS5; EIB ESS8	Regular	All contractors and sub-contractors, supervised by the Energy Valley company	Energy Valley Company and contractors' EHS personnel	USD 2,000–5,000/year
	Traffic management	Project site and Vicinity (Aol)	- No road accidents - Grievances related to traffic - Driver training records; vehicle inspection checklists; compliance with designated routes and speed limits".			Traffic management	Project site and Vicinity (Aol)	-
Stakeholders and nearby receptors	Stakeholder engagement and grievances monitoring	Project site	- Number of stakeholders engagement activities by category - Grievances received, resolved and pending response time - Gender-disaggregated data (tracking number of men and women engaged).	IFC PS1; EBRD ESR10; AfDB OS10	Ongoing	All contractors and sub-contractors, supervised by Energy Valley company	Energy Valley Company and contractors EHS/HR personnel	Included in salaries

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
workers	OHS	Construction site	Number of incidents , near misses, RIRs, training records	Labour law 14/2025; IFC/WBG EHS Guidelines; EBRD ESR2; AfDB OS2	Monthly	All contractors and sub-contractors, supervised by Energy Valley company	contactors EHS/HR personnel	Included in salaries
Operation phase								
Workplace	Noise measurements	Site boundary and near major noise-generation equipment's	Compliance of noise intensity with standards	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD ESR4; AfDB OS4; EIB ESS3	Annually	Energy Valley company	Third party (research entity or certified lab)	~10,000 EGP
workers	OHS	Project site	Number of incidents , near misses, RIRs, training records	Labour law 14/2025; IFC/WBG EHS Guidelines; EBRD ESR2; AfDB OS2	Monthly	Energy Valley company	HSSE personnel	Included in salaries
Emergency and BESS operation	Emergency preparedness and response monitoring	Project site	Emergency drills conducted, emergency response readiness, incidents and corrective actions	IFC/WBG EHS Guidelines; EBRDES4; AfDB OS4	Annually and following emergency events	Energy Valley company	HSSE personnel	Included in salaries
Stakeholders and nearby receptors	GM monitoring	AOI	- Grievance management plan developed for internal and external grievances. - Compliance with EBRD good practice for GBV and SEAH grievances.	IFC PS1; EBRD ESR10; AfDBOS10	Quarterly	Energy Valley company	HSSE personnel	Included in salaries

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
	Stakeholder engagement monitoring	AOI	- Publicly available information. - Semi-annual updates provided. - Information in Arabic with infographics where beneficial.	IFC PS1; EBRD ESR10; AfDB OS10	Annual	Energy Valley company	HSSE personnel	Included in salaries
Overall Project E&S Performance	Independent Environmental and Social Performance Audit	Project site and associated facilities	- Compliance with ESMP commitments. - ESMS requirements. - lender requirements. - corrective actions. - stakeholder engagement. - Grievance management. - OHS performance. - incident management and applicable legal requirements	AfDB Integrated Safeguards System (ISS); AfDB OSs; IFC Performance Standards; EBRD ESRs; Applicable National Legislation	Annually	Energy Valley company	Independent external E&S consultant/auditing firm	USD 10,000–20,000 per audit
Decommissioning								
Air quality (dust from demolition and dismantling)	Visual inspections and dust monitoring (if required)	Active decommissioning areas, access roads, nearby sensitive receptors	No excessive dust emissions or dust-related complaints; implementation of dust suppression measures	Law No. 4/1994 (Annex 6); IFC/WBG General EHS Guidelines; EBRD ESR3; AfDB OS4; EIB ESS3	Weekly and following complaints	Energy Valley	Decommissioning Contractor	2,000–5,000
Noise from dismantling activities	Noise monitoring and site inspections	Site boundary and nearest sensitive receptors (where applicable)	Compliance with applicable noise limits; no justified complaints	Law No. 4/1994 (Annex 7); IFC/WBG General EHS Guidelines; EBRD ESR3; AfDB OS4; EIB ESS3	Monthly and following complaints	Energy Valley	Qualified Environmental Consultant / Contractor	2,000–5,000

Receptors / Source of impact/risk	Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
Hazardous and non-hazardous waste	Waste management inspections and documentation review	Waste storage areas and disposal/recycling facilities	– Proper segregation, storage, transport, recycling, and disposal; waste manifests maintained	Waste Management Law No. 202/2020; Law No. 4/1994; IFC PS3; EBRD ESR3; AfDB OS4; EIB ESS3	Weekly	Energy Valley	Decommissioning Contractor	3,000–8,000
Soil contamination from waste, fuels, oils, or transformer components	Site inspections and spill monitoring	Fuel storage areas, dismantling areas, transformer removal locations	– No evidence of spills or contamination; spill response records available	Law No. 4/1994 and law 202/2020 / IFC/WBG General EHS Guidelines; EBRD ESR3; AfDB OS4; EIB ESS3	Weekly and after any spill	Energy Valley	Decommissioning Contractor	2,000–5,000
Occupational Health and Safety (OHS)	OHS inspections and incident reporting	Entire project site	– PPE compliance; work permits; training records; number of incidents/LTIs	Egyptian Labour Law No. 14/2025; IFC PS2; IFC PS4; EBRD ESR2 & ESR4; AfDB OS5; EIB ESS9	Daily inspections; monthly reporting	Energy Valley	Decommissioning Contractor	Included in contractor's HSE budget
Community Health and Safety	Inspection of traffic management, access control, and public safety measures	Site entrances, access roads, surrounding communities	– No unauthorized access; effective traffic management; no community incidents	IFC PS4; EBRD ESR4; AfDB OS4; EIB ESS9	Weekly	Energy Valley	Decommissioning Contractor	Included in contractor's ESMP implementation
Site restoration	Visual inspection and site verification	Entire project footprint	– Removal of infrastructure completed; site restored; no residual contamination or safety hazards	Law 4/1994 and Waste Management law 202/2020; IFC/WBG General	Upon completion of decommissioning and before site handover	Energy Valley	Decommissioning Contractor	5,000–10,000 (final inspection and verification, including any sampling if required)

Receptors / Source of impact/risk		Type of monitoring	Monitoring location	Target / Indicators	Reference Standard / Requirement	Frequency of monitoring	Responsibility	Implementation	Approximate annual costs
					EHS Guidelines; AfDB ISS; EIB ESS3				
Consolidated Estimated Annual Environmental and Social Monitoring Budget									
		Construction Phase		Decommissioning		Operation Phase			
Estimated Total Annual Cost*	(USD)	≈ USD 15,000–35,000				Approx. ≈ USD 10,000–20,000			
	(EGP)	Approx. ≈ EGP 750,000–1,750,000				Approx. ≈ EGP 500,000–1,000,000			

*The above costs are indicative estimates intended to provide an order-of-magnitude assessment of environmental and social monitoring expenditures at the current stage of project development

9. Conclusion

The Energy Valley Battery Storage Project represents a strategic contribution to Egypt's national objectives for energy diversification, security of supply, and increased penetration of renewable energy resources, thereby reducing reliance on imported fossil fuels. In this context, the No-Project Alternative is not considered a viable option, as it would forego significant environmental and socio-economic benefits associated with the development.

The Environmental and Social Impact Assessment has identified and evaluated the potential environmental and social impacts associated with the Project across its construction, operation, and decommissioning phases. Appropriate mitigation and management measures have been defined in line with national legislation and applicable international standards to ensure that these impacts are effectively avoided, minimized, or controlled.

To ensure environmental and social sustainability during construction, the Project will implement comprehensive mitigation measures, including dust and noise control, waste and wastewater management, spill prevention, traffic management, occupational health and safety procedures, biodiversity protection, and labour and community management through stakeholder engagement and grievance mechanisms.

Operational risks will be mitigated through the implementation of OHS procedures, battery safety measures, continuous fire detection and suppression systems, emergency preparedness and response arrangements, spill prevention measures, and proper hazardous waste management. Social performance is supported through the implementation of a Human Resources Policy, personnel training and awareness programs, and a transparent stakeholder engagement and grievance mechanism to address concerns and complaints throughout project operation.

To support the effective implementation of all Environmental and Social (E&S) mitigation, monitoring, management, and reporting measures identified in the Environmental and Social Management Plan (ESMP), the Project has allocated adequate financial resources. The estimated ESMP implementation budget is approximately USD 175,000 during the construction phase and approximately USD 60,000 per year during the operation phase, covering environmental monitoring, occupational health and safety, waste management, biodiversity conservation, stakeholder engagement, emergency preparedness, training, and other environmental and social management requirements.

With the implementation of the proposed Environmental and Social Management Plans (ESMPs), monitoring frameworks, and mitigation measures, the residual impacts are expected to remain within acceptable limits.

The Project is therefore considered environmentally and socially feasible, provided that all ESIA commitments are fully implemented and continuously monitored throughout its lifecycle.