

## **Draft Environmental and Social Review Summary Elengy Terminal (34603) in Pakistan**

### **Overview of IFC Scope of Review:**

The review of this Project consisted of appraising technical, environmental, health, safety, and social information submitted by the project sponsor, and undertaking a field visit in February 2014. The environmental and social (E&S) appraisal team visited Engro Vopak Terminal Ltd. (EVTL) site, the proposed Engro Elengy Terminal Ltd (EETL) LNG jetty site, the nearby mangrove area, and the route of the proposed 24 km natural gas pipeline, located at Port Qasim and the adjoining industrial zone, near Karachi, Pakistan. The E&S team held meetings with the environmental and social impact assessment (ESIA) consultants, the company's management team, and also interviewed some employees. Documents related to the ESIA, quantitative risk assessment (QRA) modeling, ship maneuvering simulation, environmental, health/safety (EHS) procedures, environmental and safety permits, environmental monitoring data, human resources policy, corporate social responsibility policy, terminal security access standards, etc. were reviewed and discussed during the appraisal.

IFC's appraisal considered environmental and social management plans for the Project and gaps if any between these plans and IFC requirements. Where necessary, corrective measures, intended to close these gaps within a reasonable period of time, have been agreed and are summarized in the paragraphs that follow and in the agreed Environmental and Social Action Plan (ESAP) disclosed in this review summary. Through implementation of these management plans and the ESAP the Project is expected to be designed and operated in accordance with Performance Standards objectives.

If IFC's investment proceeds IFC will periodically review the projects ongoing compliance with the performance standards.

### **Project Description:**

Engro Corporation Limited (Engro) is one of Pakistan's largest conglomerates with businesses ranging from fertilizers to power generation. Engro operates a liquid chemical terminal, EVTL, at Port Qasim (PQ) near Karachi. IFC plans to provide project finance to EETL LNG terminal project, located adjacent to the existing EVTL site.

EVTL is jointly owned by Engro and Royal Vopak of the Netherlands, the world's largest independent tank storage provider. EVTL currently handles jetty unloading and storages of liquefied petroleum gas (LPG), liquefied ethylene, ethylene dichloride, mono ethylene glycol, phosphoric acid, acetic acid, paraxylene, and vinyl chloride monomer. Some liquid chemicals are piped to chemical plants in the Port Qasim industry zone and others are transported out by road tankers.

For the proposed Elengy Terminal project, a branch jetty for liquefied natural gas (LNG) will be built at EVTL's current liquid chemical jetty. A Floating Storage and Regasification Unit (FSRU) will be permanently moored at the LNG jetty for LNG unloading, storage, and regasification processes. The FSRU will be provided and operated by Excelerate Energy (EE), a leading developer of LNG transportation and floating regasification infrastructure in US. The natural gas from FSRU will be transferred along a new 24 km gas pipeline to connect with the existing natural gas pipeline system.

IFC has multiple existing projects with Engro. The ongoing supervision of the existing investments in Engro indicates general compliance with IFC's environmental and social requirements and the associated overall performance is considered satisfactory.

### **Identified Applicable Performance Standards:**

- PS1: Assessment and Management of Environmental and Social Risks and Impacts
- PS2: Labor and Working Conditions
- PS3: Resource Efficiency and Pollution Prevention
- PS4: Community Health, Safety and Security
- PS5: Land Acquisition and Involuntary Resettlement
- PS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources

### **E & S Categorization and Rationale:**

A new LNG branch jetty will be constructed for LNG unloading, floating storage, and regasification. The natural gas will be transferred to the national gas pipeline network through a new 24 km underground pipeline, including a 3 km right of way (ROW) on private land outside of the port authority industry zone. Approximately 1.3 – 1.6 million cubic meters of sediment will be dredged from the jetty site. The dredged materials will be disposed within a 50 ha mangrove area inside the port industry zone as demarcated by Port Authorities.

The key E&S risks and issues include the following:

- Occupational health and safety
- Operational hazards, fire prevention, and emergency response
- Road transportation and community safety
- Biodiversity conservation for the mangrove area

Mitigation measures for the potential E&S impacts have been identified and are incorporated into an ESAP. The potential adverse E&S impacts of this project are diverse and irreversible and this is therefore an E&S Category A project.

The LNG branch jetty will be built at the existing EVTL terminal. The major portion of the pipeline will be built inside the port industry zone. The right of way for the 3-km section of the pipeline on private land will be negotiated according to market prices. Indigenous Peoples were not identified in the project area and no issues related to cultural heritage were identified in the project area; thus PS7: Indigenous Peoples and PS8: Cultural Heritage is not applicable.

### **Main Environmental and Social Risks/ Impacts of the Project and Key Mitigation Measures:**

#### **1. Assessment and Management of Environmental and Social Risks and Impacts**

**Land and Natural Environment:** The proposed LNG branch jetty and FSRU will be located adjacent to the existing EVTL jetty facility, which is along the navigable creek of PQ. 20 km of the proposed 24 km gas pipeline is inside the PQ industry zone. Approximately 1 km is along a railway and National Highway and 3 km is through a barren semi desert land. There are no residential areas near the pipeline. The nearest community to the LNG jetty is approximately 5 km away. There are mangroves near the jetty site and along the navigable creek of the Port Qasim Authority (PQA), which are natural reserve area. According to the ESIA, there is no other natural reserve area or protected species at or near the jetty or along the pipeline route.

**Corporate Environmental and Social Policy:** Engro has a corporate E&S policy, which requires management and utilization of resources and operations in such a way that the safety and health of the workforce, neighbors, customers, and visitors are ensured. Engro E&S policy also requires that safety, health and environmental responsibilities extend beyond protection and enhancement of its own facilities to include chemical transportation. EHS departments/units at each Engro facility are responsible for enforcing EHS operational procedures. The corporate E&S policy is covered during new employee induction and annual refresher training.

**Identification of Risks and Impacts:** Engro contracted external experts to conduct an ESIA for the proposed LNG terminal project. The ESIA was approved by the local environmental authority (Sindh Environment Protection Agency) SEPA after a thorough Public Hearing and review of the project by Expert's Committee. As required by IFC, the ESIA was revised to meet IFC Performance Standards and the applicable World Bank Group (WBG) EHS Guidelines. The revised ESIA also includes an assessment of cumulative impacts, air emission modeling, a quantitative risk assessment (QRA) conducted by Lloyd's Register UK, and LNG ship maneuvering simulation conducted by BMT Argoss UK. The revised ESIA postulated and analyzed a range of potential EHS risks for this project, including high risk and catastrophic risk scenarios and concluded that after implementation of mitigation measures impacts from the risks postulated can be reduced to low or insignificant level.

Environmental and Social Management and Organization: At EVTL, there are comprehensive EHS management programs and implementation procedures for each operational process, including EHS operational procedures for each workplace and ambient environment monitoring, hazardous material management, industrial solid waste management, equipment operation safety procedures, emergency response, ship EHS management, road tanker EHS management, EHS requirements for onsite contractors, etc. As part of this project, new EHS procedures will be prepared by EETL for the proposed FSRU and gas pipeline operations. The EVTL facility has acquired an Integrated Management System (IMS) for a combined and coordinated certification of compliance with ISO 9001, ISO14001 and OHSAS 18001 standards, certified by Bureau Veritas in United Kingdom and EETL shall follow the same practices. Daily EHS management is handled by the EHS unit, staffed by full-time safety and environmental engineers. At each operational unit, there are part-time EHS coordinators, who support the fulltime EHS manager/engineers for operational EHS managements. The EHS manager reports to Terminal manager. In accordance with the ESAP, EETL will conduct a risk/gap analysis for the operational alignment between EVTL and FSRU, and integrate its EHS management with the FSRU contractor's EHS management to ensure safe operations of the FSRU, gas pipeline, and the existing liquid chemicals unloading/storage.

Emergency Preparedness and Response: Fire hazard and toxic chemical release are the main operational risks at the EVTL facility and the company has strict management procedures to control fire hazard and prevent chemical leak. Personal electronics are not allowed in the storage and jetty area and all vehicles within this area are equipped with spark arrestors. There are fire and toxic gas sensors, and detection of temperature, smoke, explosion level, and toxic chemical concentrations at all high risk areas. The sensor systems and closed circuit TVs (CCTVs) are connected with the central control room at the facility and the emergency response (ER) center of PQA. As part of the project, the EVTL central control room will also monitor key safety parameters in real time.

There is enough firefighting water and foam storage on site. In case of major fire, the fire system will be automatically transferred to sea water firefighting. Sprinkler systems and foam firefighting equipment are installed at all tank farms and other potential fire sources. All firefighting equipment is routinely inspected by the EHS unit. EVTL has its own fire brigade, which is supported by PQA fire brigade. EVTL has an onsite clinic for emergency treatment and a major hospital is approximately 12 km away. Material safety data sheets (MSDS) for all toxic chemicals handled by the terminal are located at the facility. Copies of these MSDS are also kept at the ER clinic. The EETL LNG Jetty will be fully equipped with a Fire and Gas Detection System and fire monitors and sprinkler systems.

EVTL holds weekly firefighting drills, quarterly company level drills, which involve the PQA fire brigade, neighboring facilities, and the local hospital according to a scenario. As part of the project, The ER plan will include EETL, EVTL and FSRU operation and all the firefighting/ER drills will also involve the FSRU contractor.

Monitoring and Review: There is an EHS briefing before and after each shift. The management holds monthly EHS meeting with the EHS manager and each operational unit manager. Quarterly safety meetings for all employees are also held. The Terminal manager, together with the EHS department, also conducts routine EHS inspections. External safety experts are contracted for safety audits. The European based international Chemicals Distribution Institute for Terminals (CDI-T) was contracted in 2003 to audit and verify jetty/storage operation safety. This certification was replaced with Terminal Health Assessment (THA) designed and conducted by Vopak. At EVTL last THA was conducted in 2010 with score of over 95% and next THA audit is planned in 2014. Vopak also conducts routine EHS audits. Any non-compliances, identified during the various inspections/audits, are recorded by the EHS unit. Equipment can be shut-down in the case of immediate danger. Corrective actions are required for non-compliances and implementation of the action will be reviewed in the future inspection/audit. The non-compliance records and corrective actions implementation are reviewed at monthly EHS meetings.

## **2. Labor and Working Conditions**

Corporate Human Resources Policy and Management: Engro has a Human Resources policy which specifies equal opportunity, training and development, performance management, compensation and benefits and diversity and non-discrimination policy statements.

Working Conditions: EVTL has a total of 65 employees, 4 of whom are women, with ages ranging from 18 to over 56. Within the managerial level, women account for 25% of key positions. All employees have a letter of appointment that includes basic terms of employment such as contract duration, annual leave, wages and benefits and term for termination of the employment. Issues related to hours of work, overtime work and working during holidays, leave for illness, maternity, vacation or holiday, employees' right for labor protection are managed according to local labor law.

Workers' Organization: Local labor law does not have any restriction on the right to freedom of association. Although the Company places no restrictions on workers' organizations, none of company's employees or contracted workforce is members of a workers' association or labor union. The company management engages with the employees through formal annual staff meetings and informal channels. The company will revise its existing HR Policy to include a policy statement confirming employees' rights to freedom of association. A copy of the revised HR policy will be given to all employees.

Non-Discrimination and Equal Opportunity: Engro provides equal opportunities for its employees. As defined in HR policy, the company provides equal opportunity to all job applicants through clearly defined and consistently applied induction standards and creates a work environment where every employee has an equal opportunity to develop their skills and talents.

Retrenchment: It is not anticipated that there will be any retrenchment. On the contrary, it is expected that, with the Elengy Terminal project, more jobs will be created.

Grievance Mechanism: Engro has a Whistleblower policy by the name of "Speak Out" which covers harassment in the workplace. There are two main channels for the employees to raise their grievances which are used by the human resources as the grievance mechanism; informal direct complaints by the employees and formal annual communication meetings. Annual communication meetings are held where the CEO in person discusses any point of concern raised by any employee. However, this policy does not provide procedures or outline the process for handling internal grievances. The company will develop a clear process, including required steps, timelines, procedures, and appropriate level of management for handling grievances. Once developed the grievance procedure will be fully disclosed to all employees. The grievance mechanism will be accessible to both direct and third party employees, as required by PS 2.

Protecting the Work Force: There is no child or forced labor in Engro. The company also checks the contractors to make sure that all the contracted labors are at least 18 years old.

Occupational Health and Safety (OHS): As do all Engro group subsidiaries, EVTL follows Vopak Standards and is fully compliant with all Vopak Standards. The OHS management includes OHS permits, personal protection equipment, material/tool handling, hazard communication, etc. The terminal has routine OHS training, including new employee training and annual refreshers. There have been no fatal or serious accidents in the terminal's operational history, and there have been 8-hour or greater lost time injuries in the past 16 years, and no recordable injury in the past three years. Systems are in place to manage the near-miss and first-aid cases to prevent recordable accidents. Job hazard analysis (JHA) is conducted for all new position created and safety operation procedures are drawn based on the JHA.

There is sufficient personal protective equipment (PPE) at each position and employees all wear proper PPE. The company has comprehensive OHS procedures including PPE rules that relate to toxic chemical handling, heat protection, cryogen protection, operation at height, confined spaces, etc. OHS training is part of new employee induction and annual refreshers. All employees have to pass exams at induction and annual refreshers to be able to work at their positions. As part of this project, Engro is committed to monitoring of workplace air quality and noise levels at EVTL and ensure they meet both local regulatory requirements and good international industry practice (GIIP).

### **3. Resource Efficiency and Pollution Prevention**

Raw Materials and Resource Efficiency: There are no manufacturing processes at this project. The main consumption is of seawater (cooled for regasification), natural gas for turbines at FSRU, and electricity for gas pumping. Seawater will be discharged back to the sea. FSRU consumes approximately 68,000 m<sup>3</sup> natural gas per year for the gas turbines. Energy efficiency is considered in the gas turbine design and a

heat recovery system will be installed at the gas turbines. According to the design criteria, the energy consumption for regasification is 24 MWe for 7 GSm<sup>3</sup> natural gas per year, which meets the WBG EHS guideline benchmark of 30 MWe for 8 GSm<sup>3</sup>/year.

Pollution Preventions and Compliances: The primary wastewater generated onsite will be sanitary wastewater and facility cleaning wastewater, which is treated onsite before discharged. The effluents will meet both local regulatory standards and WBG EHS Guideline limits. The seawater for regasification heating will be controlled within 3 °C of the ambient seawater at the edge of mixing zone. There are onsite emergency spill tanks to hold spilled chemicals from the jetty and truck loading area. EVTL have had no major spills (>200 kg) at its operational history. The firefighting wastewater is held within secondary containment at each tank farm. EETL will monitor the emissions from gas turbine stack for this project to ensure compliance with both local and IFC requirements. Both sanitary and industry wastes are disposed of through PQA's approved waste management contractors.

Hazardous Materials and Operational Hazard: LNG will be handled by EE and regassified-liquid natural gas (RLNG) will be handled by EETL. Other liquid chemicals handled by EVTL are also hazardous materials. The handling, storage, and transportation of these materials could pose serious dangers to the employees and nearby industries if not well managed. All the storage tanks onsite go thorough periodic inspections by external experts. Quantitative risk assessments (QRA) are conducted for storage of all hazardous materials to ensure safety for major buildings onsite and nearby companies. EVTL prepares detailed procedures to handle these hazardous materials and EETL will replicate the systems for LNG handling. All the hazardous liquids are stored at above ground tanks with proper secondary containment volumes. Hazard operability studies (HAZOP) have been prepared for all the handling processes and will be updated if process is modified. HAZOP for the LNG project was held in UK in January 2014 and was conducted by Lloyd's Register, participated by Royal Vopak of Holland, China Harbor, Excelerate Energy, Technica Ltd UK, Qatargas, Port Qasim and SSGC. As part of this project, a detailed QRA and ship maneuvering simulation modeling were conducted as references for detailed designs. Subsequently, a detailed Consequence Analysis Report was conducted by Lloy'ds Register which concludes that the Exclusion Zone remains within EETL berthing pocket, i.e. 150m away from the Marine Loading Arm (MLA) manifold.

All ships are required to comply with International Maritime Organization (IMO)'s applicable regulations on the safety, security, efficiency, and the marine/atmospheric environment protections. The terminal has a 3-months advance ship planning. All ships reporting to the berth have to be pre-approved by terminal management. The similar compatibility studies between the FSRU and LNG Carrier (NGC) shall be conducted prior to engaging of the LNGC for the project. Before unloading, EHS engineers and ship operation staff will review all safety, fire prevention, leak prevention, and ER features.

All road tankers are contracted by EVTL's clients. Before each road tanker enters the EVTL site for hazardous chemical pickup, EVTL staff will check the tanker safety condition and review the certificates for tankers and drivers. Only qualified tankers and drivers are allowed to enter EVTL sites. For long-term contracted road tankers, EVTL pre-approves the extended contracts and reviews their insurance records periodically.

Greenhouse Gases (GHG): After this project is implemented, the Elengy Terminal project will generate approximately 47,000tonnesof CO<sub>2</sub>-equivalent annually, mainly from natural gas consumption at the FSRU turbine.

#### **4. Community Health, Safety and Security**

Community Health, Safety and Security: The nearest residential community to the EETL site is more than 5 km distant. The majority of the pipeline is within PQA industry zone and there are no residential areas in the industry zone. The last 3 km pipeline goes through barren privately owned land. The QRA also indicates that the impact radius under the worst scenario is within the jetty area. The normal operations at the jetty and pipeline have no impacts to the local communities.

Emergency Preparedness and Response: EVTL has ER plans available, and conducts routine drills for firefighting and potential chemical explosion/releases and EETL will prepare similar procedures for LNG.

EVTL only allows ships meeting IMO regulations to deliver the Chemicals & LPG. EETL will follow the similar procedures. For road transportation, EVTL requires its clients to only contract transportation companies that have defensive driving programs, acceptable safe driving records, and sufficient emergency response methods. EVTL also reviews insurance information for all long-term transportation contractors.

Security Personnel: The terminal shares land access through EVTL that has its own private security guards and is within PQA premises, which is itself guarded by PQA guards. The water front is under surveillance by naval intelligence guards and coast guards. EVTL is to assess the risk of having different layers of armed security forces at its facilities, and integrate an armed security usage policy and procedures into EHS management system in order to ensure that contracted security personnel records are screened before employment and that security personnel are trained on human rights and Voluntary Principles and that security incidents are recorded, investigated and corrective actions implemented. In addition, these procedures will include internal and external grievance mechanism and process code violations from security personnel against members of the community and employees.

## **5. Land Acquisition and Involuntary Resettlement**

ROW for Natural Gas Pipeline: There are no settlement areas in close proximity to the industrial zone. The total ROW for the gas pipeline is approximately 23.5 km of which 3 km are within EVTL terminal, 16 km within PQ industrial zone and around 3.5 km belongs to private land owners. The ROW is barren land. Sui Southern Gas Company's (SSGC-national gas grid operating company) Revenue and Land Acquisition Department is liaising with the Local City District Development Authority to obtain records of private land owners and is in process of contacting these land owners to procure the required ROW for the pipeline. It is clear that no involuntary resettlement or threat of this is involved and it is not expected that there will be any significant impact of this process over the private land owner households. However, because there is some uncertainty as to whether expropriation is still an option in future, as well as whether establishment of the ROW could result in any limitations on future land use or land value, the client will assess the process followed by SSGC to confirm that it is in compliance with PS5. If any gaps with PS5 are identified in future, the client has committed to take all necessary actions to close these gaps.

## **6. Biodiversity Conservation and Sustainable Management of Living Natural Resources**

Dredging Process: Approximately 1.3 – 1.6 million cubic meters of sediments will be dredged for the berth basin of the proposed LNG jetty. According to the ESIA, the main materials to be dredged are clay and sand, which are easily dredgeable. A suction dredger or cutter head suction dredger, if needed, will be adopted to minimize creek bed sediment disturbance during the dredging process. The dredged materials will be piped directly to the disposal site. In this way, the impact to the creek water environment will be minimized. The ESIA states that the creek bed environment will recover without permanent damage. As part of this project, Engro will also provide support for PQA's effort to map the sediment transportation along the navigable creek.

To protect the coastal mangrove environment and downstream fishing activities, dredged materials will not be dumped back to the creek. All the dredged materials will be used for land disposal at the location designated by PQA. Cofferdams will be constructed along the perimeters of the dredged material stockpiles to prevent loss of dredged materials. Eventually, a comprehensive shore protection system will be constructed along the perimeter of reclaimed land in order to prevent erosion and provide protection against coastal flooding, using a revetment system. As required in the ESAP, Engro will prepare a comprehensive Dredged Material Disposal Plan for the proper and safe disposal of the dredged materials.

Mangroves: There are extensive mangrove areas along PQA's navigable creek. As required by PQA, up to 50 ha mangrove forest near the LNG site will be reclaimed for future development through the disposal of the dredged materials for this project. The ESIA considers the biodiversity value of these mangroves to be limited because this area of mangroves is surrounded by industry jetties and terminal storage sites. A site for replantation of mangrove will be decided by PQA for compensation of the lost mangrove area. For each tree cut, at least five new mangrove trees will be planted to ensure no net loss of the biodiversity capacity for the mangrove habitat. The replantation plan will be prepared in consultation with International Union for Conservation of Nature (IUCN). The replantation and mangrove survival rate will be monitored by a third independent party to ensure the targets of the replantation plan.

**Natural Habitat:** The ESIA indicates that no endangered/endemic species or other triggers for Critical Habitat are known within the project area. Additional desktop review using the Integrated Biodiversity Assessment Tool (IBAT) and IUCN Red List found that while the project area occurs within the global range of some potential trigger species, none of these species are associated with mangrove habitats and are extremely unlikely to occur at or near the project area. Based on the available information, the mangrove forest in the project area is considered a natural habitat.

**Ecosystem Services:** Lack of local settlements and existing security measures by PQA exclude direct use by local communities of potential ecosystem service values that are typical elsewhere in Pakistan (e.g. fuel, construction materials or livestock fodder). Some ecosystem service value may be associated with potential nursery areas for downstream fisheries. The ESIA confirms that the project area has no unique significance as a nursery area relative to other mangrove areas. Planned mangrove compensatory measures, if successful, are thus likely to restore the necessary ecosystem functionality to – at least - maintain broader ecosystem service values related to fish nurseries (approx.5 yrs from planting).With more jetties planned at PQA, the long-term cumulative impacts to the ecosystem and downstream fishery may be minor to moderate according to the cumulative impact assessment. As part of this project, Engro will work with PQA for additional study on ecosystem services and engagement with the fishing communities.

**Client's Community Engagement:**

Being in the industrial port zone, EETL project facility is not located in close proximity of settlements. Besides providing employment opportunities to local community, the company is engaged in several community outreach activities under its Corporate Social Responsibility program by Engro. The company allocates 1% of annual before tax earning for CSR program implementation.

There is no settlement in the close proximity of Elengy Terminal project area. In addition, fishing is prohibited within the port area and the closest boundary that fishing allowed is at a distance of ~12 km. Thus, the project is not expected to have any impacts on community livelihoods.

Therefore, the project's main external communities are the other companies with industrial facilities in the same port area. The 20 km of the pipeline which will be constructed within the scope of Elengy Terminal project passes underground through some adjacent facilities. EETL has already developed a SEP and implemented it during the planning period of the project. However, EETL will ensure that an updated stakeholder engagement plan will be developed and implemented during the construction and operational phases of the project. The plan will identify the different categories of internal and external stakeholders including affected facilities and landowners, determine procedures for consultation, disclosure of information and a solid and locally applicable grievance mechanism.

**Local Access of Project Documentation:**

Engro will disclose this document in the local prevailing language at Engro's website (<http://www.engro.com/download-library/download-library-announcements/engro-corp-announcement/>). For inquiries or concerns about the environmental and social impacts of this project please contact:

Mr. Sheikh Imranul Haque  
Engro Elengy Terminal Limited  
8th Floor, The Harbor Front Building, HC3, Marine Drive Block 4, Clifton Karachi  
T: 111 311 311  
F: +92 21 35293906