NON-TECHNICAL SUMMARY OF THE ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT OF THE LIQUEFIED NATURAL GAS (LNG) BUNKERING PROJECT IN THE SULTANATE OF OMAN, IN SOHAR

1 INTRODUCTION

Marsa Liquefied Natural Gas LLC is a single integrated company owned by TotalEnergies EP Oman Development B.V. (80% equity) and Almuzn Liquified Natural Gas LLC (OQ) (20% equity)

TotalEnergies is the fourth largest publicly-traded integrated international oil and gas company in the world and employs approximately 100,000 people worldwide with operations in more than 130 countries. The company has activities in every sector of the oil and gas industry: including in the upstream (oil and gas exploration, development and production, liquefied natural gas) and downstream (refining, petrochemicals, specialty chemicals, the trading and shipping of crude oil and petroleum products, marketing). In addition, TotalEnergies operates in the power generation and renewable energy sector.

OQ is a global integrated energy company headquartered in Muscat, Sultanate of Oman. OQ operates assets and has investments in 17 countries covering the entire energy value chain from upstream, midstream to downstream refining, petrochemicals, marketing, and alternative energy. The Project owner is proposing to develop a Liquefied Natural Gas (LNG) Bunkering Project in the Sultanate of Oman, in Sohar, to supply LNG as a fuel to marine vessels (hereafter referred to as the Project). This is planned to be achieved through the downstream development of a new 1 million Ton Per Annum (MTPA) liquefaction plant. The LNG plant will be built on reclaimed land in the Sohar Industrial Port Area (SIPA), located in the Wilaya of Liwa in the Governorate of North Al Batinah. The gas to be delivered and processed at the LNG Plant will be supplied through the OQGN network, which is Oman's exclusive gas transportation system operator. The volume of feed gas to be liquefied in the LNG Plant corresponds to MARSA LNG LLC's gas equity produced by the upstream Block 10, operated by Shell Development Oman (53.4% equity) in a joint venture involving MARSA LNG LLC (33.2% equity) and OQ (13.4% equity). Gas will be treated, liquefied, and stored onshore to provide an LNG fuelling (i.e., bunkering) service to marine vessels via a dedicated LNG marine terminal. The Project is hereafter referred to as the LNG Bunkering Project.

The Project requires permitting by the Environmental Authority (EA) through the Sohar Industrial Port Company (SIPC) and an Environmental and Social Impact Assessment (ESIA). Five Oceans Environmental Services LLC (5OES) is an Omani registered company and has been appointed in partnership with ERM by MARSA LNG LLC to undertake the ESIA as an independent environmental consultancy. As international financing is being considered for the Project, the International Finance Corporation (IFC) Performance Standards on environmental and social management have been considered in the development of the Environmental and Social Impact Assessment (ESIA) report.

The requirements of the IFC Performance Standards are reflected in the impact assessment and mitigation measures presented in the ESIA, and in additional documents supporting the implementation of mitigation and management measures. The Environmental and Social Management Plan (ESMP) and individual supporting management plans for specific topics will be implemented within a robust Environmental and Social Management System (ESMS) in due course.

This document represents the Non-Technical Summary of the ESIA and has been developed to support the process of disclosing the results of the impact assessment process and the mitigation measures defined for the Project.

1.1 Project Background

The ESIA follows the completion of a Scoping Report that was submitted to SIPC on the 20th of January 2020. The Scoping Report provided a description of the baseline environment, a description of the

stakeholder engagement for data collection undertaken at the time of writing, and a preliminary appraisal of the potential impacts of the Project. The terms of reference (ToR) of the ESIA were provided in the Scoping Report, presenting the range of issues to be addressed in the ESIA process with regards to the baseline desktop studies and field surveys and to the scope of the ESIA Report. A meeting was held between MARSA LNG LLC, 5OES, ERM and SIPC on the 22nd of January 2020 to discuss the results of the Scoping exercise. Following the Scoping exercise, an ESIA report was prepared incorporating comments from SIPC, provided on the Scoping Report, and those provided to the ESIA following their review.

The ESIA report was not further submitted to EA for approval because TotalEnergies' project timelines changed for several reasons including project design and the COVID pandemic, among others. The Project was officially put on hold in March 2021 and reactivated early 2023.

The main Project changes since 2021 are presented below and these have been considered in this updated version of the ESIA which was prepared in 2023:

The Project's location, which was originally planned to be in a future reclaimed land within the industrial area of Sohar, has changed to land that has already been reclaimed (still within the industrial area of Sohar) located approximately 500 m away from the original area. The size of the reclaimed land itself is slightly smaller (44.5 ha) than the original plot which was 45.0 ha.

- With the change of location, the layout of the plant (which will now occupy 44.5 ha of the reclaimed land area) has changed; however, the level of risk remains the same as the Basis of Design/criteria, and the original safety studies will not be significantly affected.
- Changes were made with the objective to reduce GHG emissions, such as removing the furnace as heating medium, and instead using an electrical heater.
- A solar plant is planned to be constructed on a different plot as an offset solution for the Project, as it will compensate GHG Scope 2 emissions of the LNG plant. The solar plant will be assessed in a separate ESIA; however, it is considered as an associated facility in the scope of the Project.

1.2 Project location and Area of Influence (AoI)

The Project site is located in the Sohar Industrial Port, specifically in the Sohar Port South development which lies in the Wilaya of Liwa in the Governorate of North Al Batinah.

The Area of Influence (AoI) has been defined taking into account the following factors:

- Physical extent of the proposed works, as defined by the project design;
- Nature of the baseline environment and the manner in which the impacts are likely to be propagated; and
- Governmental administrative boundaries, which provide the planning and policy context for the project.

The ESIA considers two area of influence:

- **Environmental AoI:** It includes the site itself and the surrounding area where potential direct environmental impacts and risks are anticipated. Specifically, it has been defined to include a buffer of 2 km around the LNG plant and the jetty, as presented in Figure 1-1 (dotted green line). It encompasses the Project components, ancillary facilities, and the expected spatial extent of potential environmental direct impacts from long-term operation.
- **Social AoI:** It includes the site itself and the surrounding area where potential direct social impacts and risks are anticipated. It includes a total of 12 villages or settlements located within a 2 km radius of the Port, although focus has been placed primarily on those villages that may be more directly affected by the development due to their proximity, namely Majis, Ghadafan, Al Khuwairiyah and Falaj al Qaba'il.

The list of settlements in the Social AoI is provided in Table 1.1 below. Figure 1-1 below shows the direct Social AoI for the Project, while the map insert shows the boundaries of the Wilayat of Sohar and Liwa which are considered as part of the broader study area.

Table 1.1 Social Area of Influence (AoI) Settlements

Governorate	Wilaya	Settlement	Distance from the Project
Norther Al Batinah	Sohar	Majis	3.7 km
	Sohar	Al Khuwairiyah	3.7 km
	Sohar	Falaj al Qaba'il	4.9 km
	Liwa	Ghadfan	3.2 km
	Liwa	Al Ghuzayyil	3.3 km
	Liwa	Al Hadd	3.9 km
	Liwa	Wadi al Qasab	4.6 km
	Liwa	Uqdat al Mawani	5.3 km
	Liwa	Al Mukhaylif	5.8 km
	Liwa	Liwa	7.6 km
	Liwa	Hallat Al Sheikh	4.9 km
	Liwa	Harmul	5.2 km

Source: ERM, 2023.

Figure 1-2 shows the Project location and surrounding infrastructure.

Source: ERM, 2023.

Figure 1-1 Project Social and Environmental Area of Influence (AoI)

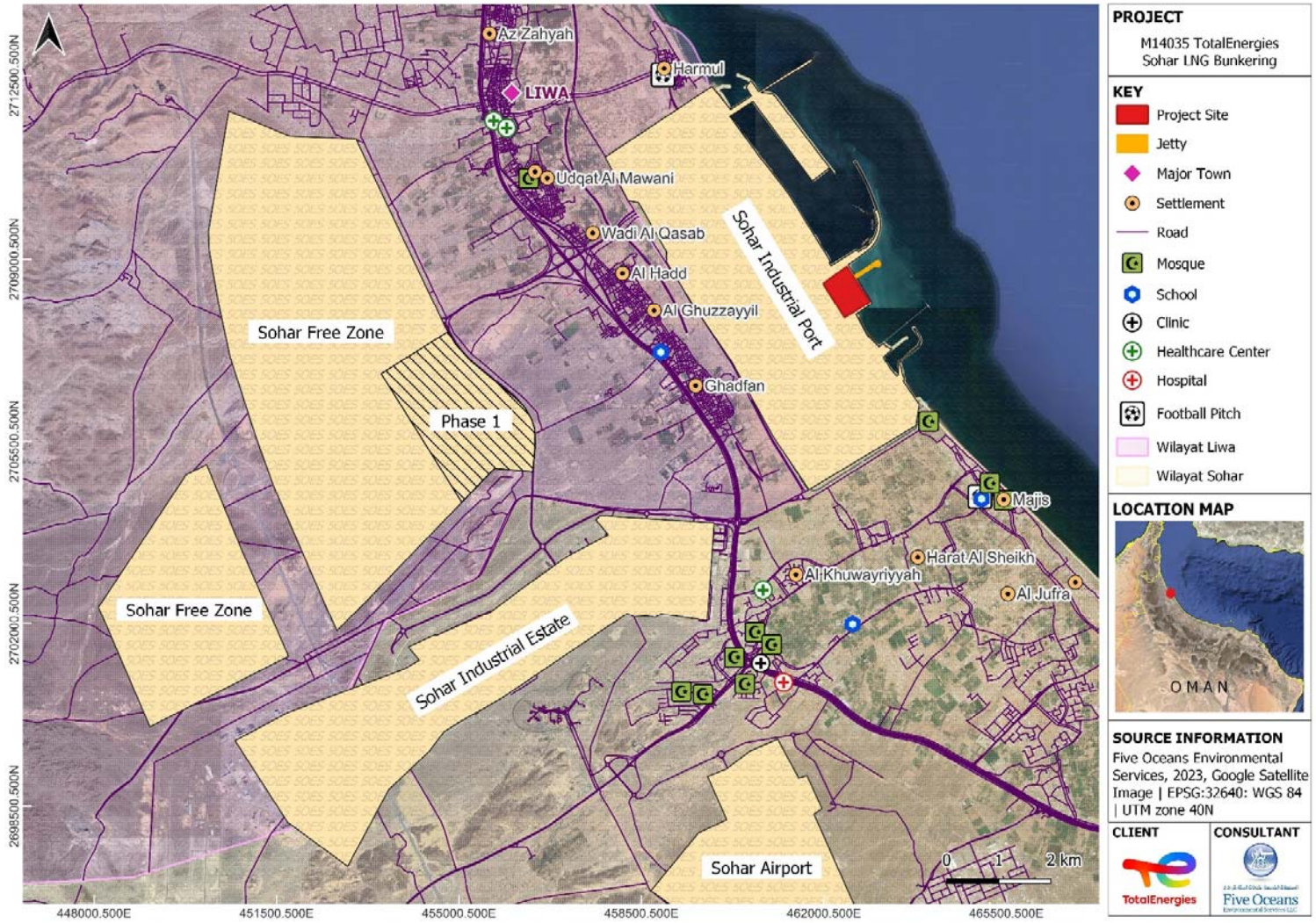


Figure 1-2 The Project location and surrounding infrastructure

2 REGULATORY AND ADMINISTRATIVE FRAMEWORK

Environmental protection within Oman is primarily governed by the "Law for the Conservation of the Environment and the Prevention of Pollution" (Royal Decree, RD, 114/2001) administered by the Environmental Authority (EA; previously called the Ministry of Environment and Climate Affairs, MECA). The environmental permitting process is regulated by the Authority Decision 107/2023 issued in August 2023.

In accordance with national legislation (MD 48/2017**Error! Reference source not found.**), the Project is classified as a Category 'A' activity and requires an Environmental Impact Assessment (EIA).

While the EA is the national authority with regard to EIAs in Oman, SIPC, through a Memorandum of Understanding with EA, has the responsibility of managing environmental related issues and overseeing the EIA process in the Sohar Port (i.e., where the Project is located). SIPC is the lead concessionaire, and its corporate policies apply (Rules and Regulations) to the design, permitting, construction, and operation of the Project. Once approved by SIPC, the recommendation for approval is submitted to EA which then issues the environmental permit. In addition, SIPC guidelines require the EIA to incorporate Integrated Pollution Prevention and Control (IPPC), Seveso III Criteria (Directive: 2012/18/EU), as well as best available techniques (BAT). These have been considered for this Project as Best Practice.

As international financing may be required for the Project to proceed, the IFC Performance Standards and IFC Environmental, Health and Safety Guidelines and the Equator Principles are considered. Consequently, according to the Equator Principles 4, a Climate Change Risk Assessment (CCRA) and a Human Rights Risk Assessment (HRRA were prepared.

In addition, TotalEnergies' international corporate standards are also applied to the development of the ESIA and include:

- Environmental Impact Assessment of E&P Activities (GS EP ENV 120);
- Social Impact Assessment (GS EP SDV 102);
- Social Baseline Study (GS EP SDV 101);
- Environmental Requirements for Projects Design and E&P Activities (GS EP ENV 001);
- Environmental Baseline and Monitoring Studies: Onshore Sites (GS EP ENV 111);
- Environmental Baseline and Monitoring Studies in Offshore and Coastal Waters (GS EP ENV 112);
- GIS Deliverables for HSE (GS GR HSE 412).

3 PROJECT DESCRIPTION

The LNG Bunkering Project (i.e., the Project) consists of an onshore plant treating quality gas to produce LNG, primarily dedicated to LNG bunkering activities but also to load LNG carrier vessels calling at Sohar Port. The LNG plant will be built on reclaimed land protected by an embankment and leased by SIPC. From a design perspective, the main Project concept has been selected and the Front-End Engineering Design (FEED) has been conducted to develop the Project concept.

The Project will consist in the following key elements:

- **LNG Plant:** consisting of a series of equipment and processes through an LNG Train and related auxiliary equipment to liquefy Natural Gas and produce LNG.
- **Condensate Export Pipeline:** comprising a short pipeline (< 1 km) that will supply condensate (a by-product of the LNG Plant production) to ADVARIO's tank farm (former Oil Taking Terminal - OTT) for future use by another industry within the Sohar Port (i.e., OQ Refineries and Petroleum

Industries LLC - OQRPI). Outside of MARSA LNG LLC's fence line, the condensate export pipeline will cross an existing pipeline corridor within the port to reach the tank farm fence which is located approximately 100 m from the fence. Around 10 m of the pipeline may be buried, and the rest will be above ground on the existing/upgraded pipe rack. While the pipeline construction, tie-in to ADVARIO's tank farm and commissioning will be completed an EPC Contractor of MARSA LNG, the operation and maintenance of the pipeline will be the responsibility of MARSA LNG.

- **Electrical Transmission Line:** comprising an approximately 3.5 km-long buried electrical cable that will connect the LNG substation with the existing substation operated by Oman Electricity Transmission Company (OETC) within the Sohar Port. The installation, termination, and connection between the two substations will be undertaken by MARSA LNG LLC's EPC Contractor. Operation and maintenance of the LNG substation as well as the underground transmission line will be the responsibility of MARSA LNG.
- **Topside of the LNG Export Jetty:** the jetty subsea foundation and access road will be designed and built by SIPC and is outside the Project's scope. However, the jetty topsides (operational area) will be completed by MARSA LNG LLC's EPC Contractor and falls within the Project's scope. The topside elements required for loading include a pipe rack, process manifolds, LNG loading arms, safety measures, and a jetty control station. The operation of the jetty topsides is within the Project's scope, while the substructure maintenance and mooring operations remain within SIPC's scope of work.

In addition, the following associated facilities[1] are considered for the Project:

- An extension to the OQ Gas Networks S.A.O.C **(OQGN) feed gas pipeline**: the existing OQGN network will be extended by approximately 2.5 km, to feed the LNG Plant with natural gas up to a Receiver Station operated by OQGN nearby the LNG Plant. The pipeline extension will be buried and will run within an existing pipeline corridor within the port. The construction, operation and maintenance of the Pipeline will be performed by OQ GN and is not part of the Project's scope;
- The **marine component of the Jetty**: the subsea part of the Jetty (i.e., foundation and structure) will be designed and built by SIPC and is not part of the Project's scope. It is anticipated to be around 450m-500m long and equipped with a 4-m wide road.
- A **solar plant** is planned to be constructed on a separate plot to supply power to the LNG Plant during operation. The solar plant will be connected to the grid network and from there, energy will be procured for the LNG Plant. The LNG plant will consume around 44% of the energy produced by the Solar Plant during the day through power wheeling agreements with OETC for usage of their grid network for power supply. Nighttime electricity will be procured from the OETC Grid through the same dedicated power connection. Since the Solar plant will be producing the entire energy needs of the LNG plant during the day itself, there will be an excess of around 56% during the day which will be sold on the Omani spot market. The solar plant is not part of the Project's scope, and it will be evaluated in a separate and dedicated ESIA. However, considering that it is built as an offset GHG Scope 2 emission solution for the Project, the potential cumulative impacts associated to the construction and operation of the solar plant have been assessed as part of the Project's impact assessment.

The yearly LNG Plant capacity is around 1 Million Ton Per Annum (MTPA). The gas will be delivered by the OQGN network at the expected average rate of 150 Million Standard Cubic Feet per Day (MMSCFD) to the Plant inlet. The flow rate will be 158 MMSCFD considering the LNG plant availability.

The feed gas will be pre-treated upstream of the LNG plant site and will be delivered to the LNG plant by OQGN's existing pipeline network. Additional pre-treatment will be required at the LNG plant to further refine the gas for export. Upon arrival to the inlet facility, the feed gas will flow through an inlet

[1] Associated Facilities (AFs) to the Project are facilities (i.e. infrastructure developments) that are not funded by the Project and that would not have been constructed or expanded if the Project did not exist, and without which the Project would not be viable.

facility made of a series of filters to remove black powder and a let-down unit that will reduce the gas pressure and temperature. Filtered feed gas will flow through a mercury-removal unit to prevent mercury amalgam corrosion (or liquid metal embrittlement) of aluminium equipment in the cryogenic sections of the plant. Carbon dioxide (CO_2) will be removed by an Acid Gas Removal Unit (AGRU) through an absorption process using an amine solution. Water will be removed to prevent hydrate and ice formation in the cryogenic section using a dehydration unit with regenerative molecular sieve beads. Heavy hydrocarbons and benzene that can freeze in the cryogenic section will be removed to produce Condensate (a by-product) that will be exported through the Condensate Export Pipeline.

The LNG produced in the plant will be sent to an onshore storage tank before being loaded to bunkering vessels or LNG carriers via a dedicated LNG marine terminal (jetty and associated LNG loading system). While the vessel traffic is not part of the Project's scope, it is considered as an associated activity, therefore, the activities associated to marine traffic, vessel movements and operations inside the port area are part of the scope of this ESIA.

All vapours generated during loading system will be returned to the Boil-off Gas Recovery System of the facility, compressed, and send back to the LNG train.

To minimize the impact of Project activities, a Carbon Footprint Reduction exercise has been carried out to identify GHG reduction initiatives for the Marsa LNG project. Among the solutions that have been selected at a design stage of the Project are:

- The plant has been designed as a zero-flaring plant, where all the normal flaring base line emitters (flare header purging, compressor seal gas vents) have been eliminated. In addition, the following design solutions have been considered:
  - to reduce the natural gas flaring amount, thanks to the relatively small size of the facility and its location in a middle of an industrial area, an approach that uses nitrogen has been developed. This approach has greatest benefit during the plant's initial start-up but will also be used after every major shutdown. The methodology consists of starting up the facility under nitrogen and to perform defrosting operations with it.
  - to reduce the requirement for flaring, Marsa LNG has implemented the recovery of its compressor seal gas for major compressors which use seal gas.
  - The proposed design will include the best-in-class passing valve design and will implement the latest guidance on passing valve identification/ repair. Any identified passing valves can be repaired promptly online using temporary operating procedures.
- A thermal oxidizer has been selected to combust traces of methane remaining in the vented nitrogen of the NRU. The methane will then be converted into CO_2, significantly reducing emissions.
- MR refrigerant composition adjustment valves will not be routed to the flare but will be sent back to the process which will also prevent flaring in case the Main Cryogenic Heat Exchanger develops leaks as these will be recovered instead of being sent to the flare.
- All compressors in the LNG plant will be driven by electric motors with the electricity being drawn from the existing OETC's substation through the Electrical Transmission Line.
- The cooling system selected for the Project will use air instead of water due to water scarcity in the Project area.

The Project schedule comprises the following three phases:

- *Construction, pre-commissioning and commissioning phase (Phase 1)*: includes civil works, construction of buildings and installation of temporary site facilities, as well as mechanical and electrical works. The LNG Plant construction activities are planned to take approximately 34 months including pre-commissioning and commissioning phases. Currently it is foreseen that the main construction activities will start in the third quarter of 2024 and will be concluded with the start-

up of the plant in mid-2027. The commissioning phase will last 15 months and will start by the first quarter of 2026.

- *Operations and maintenance phase (Phase 2):* From the LNG plant start-up, operation will commence and involve periodic maintenance activities at the Project site facilities and associated infrastructure. The design life of the LNG plant is 25 years.
- *Decommissioning phase (Phase 3):* At the end of the planned operational lifetime, the operation of the Project facilities and associated infrastructure will be reviewed and either extended or decommissioned. Decommissioning will involve the removal and reuse / recycling / disposal of surface structures and the reinstatement and restoration of the site.

During Phase 1, a maximum of 1,800 workers are expected on site during the peak of the construction activity, working 10 hours per day with overtime of 2 hours for some sections. Construction work will be implemented on a rotation or shift system basis. The workforce will consist of at least 30% Omani workers while the rest will be other country nationals (OCN). Internationally recognised worker conditions, health, safety and environment standards for workers will be applied and full-time doctors and paramedics will provide 24-hour medical cover by direct presence or on call.

The predicted average number of personnel during Phase 2 is approximately 120 people. The work regime will typically be on a resident basis and a limited number of staff will be on shift basis.

The Project will make use of the existing facilities and infrastructure in the Sohar Port and Freezone Port. Some facilities will be used directly (e.g., existing accommodation camps and laydown areas or warehouses in the Freezone Port Area, the water supply network, waste and wastewater treatment facilities, and existing roads at the Sohar Port Area). Some roads will be slightly modified in order to access the LNG plant, including the existing access road to the site and small modifications will be made to the port's electrical substation in order to accommodate the new power transmission line.

4 ESIA OBJECTIVE

The purpose of the ESIA is to document the potential effects of the Project and recommend measures to manage and monitor those effects. The main objectives are:

- To define the scope of the Project and the potential interactions of Project activities with the natural and social (including socio-economics and health) environment that will be assessed;
- To assess applicable national and international legislation, standards and guidelines, to allow for the various stages of the proposed Project to take into consideration the requirement of Omani legislation and MARSA LNG LLC's Health Safety Social Environment and Security policy and standards along with internationally accepted environmental guidelines;
- To provide a description of the proposed Project activities and the existing physical, biological, socio-economic and human environment that these activities may interact with.
- To assess the potential environmental and social impacts resulting from the Project activities and identify viable and practical mitigation measures and management actions that are designed to avoid, reduce, remedy or compensate for any significant adverse environmental and social impacts and, where practicable, to maximize potential positive impacts and opportunities that may arise due to the Project; and
- To provide the means by which the mitigation measures will be implemented and residual impacts managed, through the provision of an Environmental and Social Management Plan (ESMP).

5 STAKEHOLDER ENGAGEMENT

5.1 Past engagement

Effective stakeholder engagement and public consultation is a cornerstone of successful project development and MARSA LNG LLC is committed to engaging with stakeholders throughout the Project lifecycle. A Stakeholder Engagement Plan has been developed for the Project and is appended to the ESIA. This document identifies Project stakeholders, presents past engagement activities as well as the commitments of the Project owner with regard to stakeholder engagement and grievance management as the Project progresses.

Engagement as part of the baseline process (integral component in the development of the ESIA report) was conducted during the 9-day field survey from October 27th to 31st and November 3rd to 6th 2019 and was led by a combined 5OES and ERM Team. The purpose of the field survey was:

- To collect specific socioeconomic, health, and human rights data at the local level to the extent available and at the Wilaya level; and
- To establish initial contact with key stakeholders in Muscat and Sohar and introduce the Project.

As part of the engagement process conducted in 2019, two separate meetings with the Walis of Liwa and of Sohar and other local government representatives to disclose basic Project information and collect feedback on the Project and request baseline data were organised. Additionally, over 35 meetings with key governmental and non-governmental stakeholders at the national, regional and local levels were also organised.

The feedback provided by stakeholder in 2019 and how it has been addressed in the ESIA is provided below:

Table 5.1 2019 Feedback from stakeholders

Stakeholder issues and concerns reported in 2019	How the ESIA has addressed these?
Local economy and employment: prioritising access to employment for people (including women and youth from fishing communities) in the local Project area; expectations for local suppliers to access procurement opportunities relating to the Project; expectations for Omani people employees by contractors during construction to access employment during operation;	The construction workforce is estimated to peak at 1,800 and the operations workforce is estimated at 120 people. Goods and services will be sourced locally, where possible. The ESIA has assessed impacts on economy and employment as **Positive – ESIA Chapter 8.6.1**. Section 6 of this NTS presents the results of the impact assessment and mitigation measures.
Fishing: Loss of fishing grounds determined by environmental pollution, land reclamation and Port extension	The construction of the Sohar Port in the early 2000s in the Wilaya of Liwa resulted in the loss of fishing grounds corresponding to the Port's concession area and restriction area (3 km into the sea and 7 km wide), as well as fishing grounds along the beach in the nearshore area where the Port was built. The LNG Plant will not result in additional restrictions to fishing or navigation and therefore no additional impacts on fishing livelihoods are expected.
Community Cohesion: Concerns that the increase in population of expatriate workers can affect community cohesion and increased demand for social services.	The ESIA has assessed impacts on Community Cohesion and Expectations in **Chapter 8.6.5**. Section 6 of this NTS presents the results of the impact assessment and mitigation measures.
Environment and Health: Concerns relating to potential Project impacts, including air quality impacts related to processing of the gas, increase in cumulative emissions, etc. Community perception is that air quality degradation due to industrial activities in the Port has contributed to increased incidences of	The maximum concentration levels of air pollutants are confined within the LNG plant site whilst the closest receptors are located more than 2 km from the LNG plant, which is sufficiently far to not be reached by any significant concentrations of the modelled pollutants. The waste facilities operators are assumed to have

Stakeholder issues and concerns reported in 2019	How the ESIA has addressed these?
asthma and respiratory illnesses and allergies in local communities. Waste management was also cited as a major concern regarding the Project.	sufficient capacity to treat waste without causing disruption to local communities. Section 6 of this NTS presents the results of the impact assessment and mitigation measures.
Community Investment: The Project is expected to consider Oman LNG in Sur as a benchmark project for good CSR and local employment practice and for MARSA LNG LLC's to follow the same targets for CSR investment (i.e. 1 to 1.5% of revenue). Expectations that the Project assigns a percentage of revenues and royalties to social projects benefiting local communities. Expectations that local communities (and vulnerable groups) closer to the coast receive support from the Project to balance out some of the perceived negative environmental impacts of the Port operations affecting them (i.e., air pollution, odour, seawater pollution, groundwater salinity, etc.).	The ESIA has assessed impacts on Community Cohesion and Expectations in Chapter 8.6.5. Section 6 of this NTS presents the results of the impact assessment and mitigation measures.
Stakeholder Engagement: Expectations that engagement with local communities, Sheiks, and the Walis continues after the start of construction and throughout the Project's lifecycle. Recommendation to establish a Committee with community and government representatives from each Wilaya through the Wali's office to facilitate communication and participation in the Project.	A Stakeholder Engagement Plan is in place for the Project (Appendix B to the ESIA) and it presents commitments around stakeholder engagement throughout the entire Project lifecycle. The Project will appoint a CLO to serve as interface between the Project and local stakeholders, including communities. The CLO's role and responsibilities will include oversight of day-to-day community and stakeholder engagement activities and responsibility for interfacing between the stakeholders and the Project including its Contractors.

5.2 ESIA Disclosure

The ESIA Report in English and this Non-Technical Summary in Arabic, as updated in 2023, will be disclosed for a period of 30 days to the stakeholders and general public both in electronic form and as hardcopies. The availability of the ESIA report for public consultation will be announced in due course so that stakeholders have time to review the documents before being invited to provide feedback and/or attend disclosure meetings.

In addition to the disclosure in electronic form, one hardcopy of the ESIA Report in English language and 10 copies of the NTS in Arabic will be provided at the each of the following locations: Wali Office in Liwa and Wali Office in Sohar and in the Office of the Governor of North Al Batinah so that stakeholders who are less digitally literate also have the opportunity to learn about the Project and provide feedback. The documents will be located in an area which is overseen by the institution security to prevent damages or people taking the files away. One box and 50 hard copies of the feedback form will also be provided together with each ESIA hardcopy to allow people to provide written feedback in the box. Other means by which stakeholders can provide feedback include:

- Using feedback forms which will be available to participants in the public meetings.
- By calling the phone number: +968 92008157, during the entire disclosure period;
- Electronic communication, via email at esia.grm@totalenergies.com, during the entire disclosure period.

Anonymous feedback will also be considered.

Within no more than two weeks after the publication of the ESIA, the following public meetings will be organized at the Wali of Liwa and Wali of Sohar offices or other suitable locations. Invitations will be sent to these stakeholders with sufficient time in advance to allow attendance of the meetings:

- One meeting with the Wali of Liwa, representatives of the Municipal Council and Majlis A'Shura, with the Sheiks of Liwa, with the representatives of the communities of Liwa including women representatives, youth representatives and with representatives of the fishermen of Liwa.
- One meeting with the Wali of Sohar, representatives of the Municipal Council and Majlis A'Shura, with the Sheiks of Sohar, with the representatives of the communities of Sohar including women representatives, youth representatives and with representatives of the fishermen of Sohar.
- One meeting with representatives from the fishing communities surrounding Sohar Port (Liwa, Harmul, Ghadafan, Majis and Sohar) to fill details of interactions/interface between these communities and Sohar port and obtain general details about the status of fishing in the area and issues faced by the sector. Attendees are assumed to be members of the Fishermen's Association of Oman and/or the local Senat Al Bahr committees.

Disclosure meetings will serve to inform governmental stakeholders as well as non-governmental stakeholders of the results of the impact assessment, the proposed mitigation measures and the Project Grievance Mechanism. There will also be explanations of how stakeholder concerns gathered during the baseline phase have been considered and will provide further opportunity to receive comments, concerns and recommendations from stakeholders on the Project's potential impacts and proposed mitigation measures..

Following the disclosure meetings and expiration of the 30-day disclosure period, any changes to the Project or the conclusions of the approved ESIA resulting from the disclosure and stakeholder feedback process will be formally notified to the EA. The disclosure activities and feedback received will be reflected in an updated version of the Project's Stakeholder Engagement Plan (Appendix B to the ESIA Report).

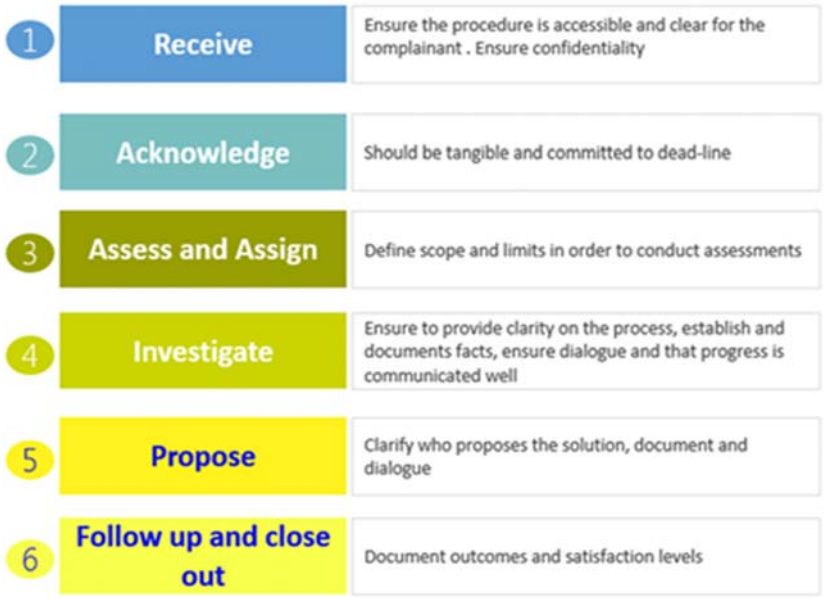
5.3 Community Grievance Mechanism

The Community Grievance Mechanism enables any stakeholder to make a complaint or a suggestion about the way the Project is being implemented. Grievances may take the form of specific complaints for damages/injury, concerns about routine Project activities, or perceived incidents or impacts.

The purpose of the Community Grievance Mechanism is to implement a formalised process (identification, tracking and redress) to manage complaints/grievances from communities and other local stakeholders in a systematic and transparent manner that could potentially arise from the Project.

Figure 5-1 below shows the grievance mechanism process.

Figure 5-1 Community Grievance Mechanism Process



Source: TotalEnergies, 2020

Stakeholders will be offered different communication channels for submitting a grievance including:

- Directly to the MARSA LNG LLC's CLO by filling the dedicated form submitted at one of the dedicated locations.
- Directly to the MARSA LNG LLC's CLO or EPC CLO, during engagement activities;
- Through the phone number +968 92008157 or email esia.grm@totalenergies.com.
- Indirectly through the appointed grievance coordinator within the EPC contractor in the course of their duties as well as through the local community representatives (Sheiks).
- Through other designated access points including a dedicated phone number and letters to the Project site office or contact form of the Project website.

These grievances may be in written form or verbal complaints and shall be treated with equal respect.

6 IMPACT ASSESSMENT

The Project's potential impacts have been assessed according to their significance and the implementation of the preventive and mitigation measures, resulting in residual impacts.

The identification of the impacts has been based on the potential interaction (i.e., potential impact) between the specific Project activities and the assessed environmental or social and health receptor or resource (e.g. terrestrial and marine ecology, noise, groundwater, surface water, economy and employment, community health and safety, etc.). The following impact assessment matrix has been used:

		Sensitivity/Vulnerability/Importance of Resource/Receptor		
		Low	Medium	High
Magnitude of Impact	Negligible	Negligible	Negligible	Negligible
	Small	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The assessment of potential impacts generated by the Project has been conducted on the three following phases:

- Construction, pre-commissioning and commissioning;
- Operation and maintenance; and
- Decommissioning.

Table 6.1 Summary of impact assessment during Phase 1 of the Project: Site preparation, Construction and Commissioning

Aspect	Description of Impact	Residual Significance
Air quality	Reduced ambient air quality caused by vehicles and machinery involved in construction activities	Minor
Noise	Noise emissions from construction activities	Minor
Soil	Soil degradation and contamination during site preparation works	Negligible
Ground water	Groundwater degradation and diversion from excavation and spillage of hazardous material during construction.	Negligible
Surface water	Disruption and contamination of storm water runoff from excavation and hazardous material spills during construction.	Negligible
Landscape and Visual	Reduced landscape aesthetic from material laydown area and dust generation during construction.	Negligible
Terrestrial Ecology and Habitats	Disruption to terrestrial ecology and habitat from waste and spillage of hazardous material during construction.	Negligible
Seawater & Sediment Quality	Degradation of marine environment quality from material transport by sea, construction and commissioning activities and materials	Negligible
Marine Ecology and Habitats	Degradation of marine habitat quality and ecosystem function from construction activities.	Negligible
Protected Species / Critical Habitat	Impacts to protected species and critical habitat from underwater noise and ship strikes.	Negligible
Livelihood and Local Economy	Temporary direct and indirect employment opportunities	Positive
	Temporary economic impacts from taxes and fees, procurement and worker spending	Positive
Workers Management	Workers' Rights, Child Labour and Forced Labour in the supply chain	Minor
Community Health, Safety and Safety	Safety Risks due to Increased Marine Traffic and vessel collisions	Minor
	Impacts on Environmental Health - Air Quality degradation	Minor
	Increased transmission of communicable diseases	Minor
	Increased pressure on health care	Minor
Traffic and Transport	Disruption to existing road users on local roads during construction	Minor
Community Cohesion and Expectations	Disturbance from presence of workforce	Negligible
	Influx of Non-Local Workers and Opportunity Seekers	Negligible
	Unmet expectations of benefits	Minor

Table 6.2 Summary of impact assessment during Phase 2 of the Project: Operation and Maintenance

Aspect	Description of Impact	Residual Significance
Air quality	Reduced ambient air quality caused by LNG start-up activity	Minor
	Reduced ambient air quality caused by LNG normal operations	Minor
	Reduced ambient air quality caused by vessel movement and loading	Minor
Noise	Noise emissions from LNG operations	Minor
Soil	Soil contamination during operation and maintenance phase	Negligible
Ground water	Groundwater degradation from operational hazardous material spills.	Negligible
Surface water	Contamination of storm water runoff from waste and hazardous material spills.	Negligible
Landscape and Visual	Reduced landscape aesthetic caused by flaring during operation.	Minor
Terrestrial Ecology and Habitats	Disruption to terrestrial ecology and habitat from waste, noise and air emissions, and flaring during operation.	Minor
Seawater & Sediment Quality	Degradation of seawater and sediment quality as a result of vessel and jetty operations, and storm water runoff	Negligible
Marine Ecology and Habitats	Degradation of marine habitat quality and ecosystem function from operation activities.	Negligible
Protected Species / Critical Habitat	Impacts to protected species and critical habitat from underwater noise and ship strikes	Negligible
Livelihood and Local Economy	Temporary direct and indirect employment opportunities	Positive
	Temporary economic impacts from taxes and fees, procurement and worker spending	Positive
Workers Management	Workers' Rights, Child Labour and Forced Labour in the supply chain	Minor
Community Health, Safety and Safety	Safety Risks due to Increased Marine Traffic and vessel collisions	Minor
	Impacts on Environmental Health - Air Quality degradation	Minor
	Increased transmission of communicable diseases	Minor
	Increased pressure on health care	Minor
Traffic and Transport	Disruption to existing road users on local roads during operations	Negligible
Community Cohesion and Expectations	Unmet expectations of benefits	Minor

Table 6.3 Summary of impact assessment during Phase 3 of the Project: Decommissioning

Aspect	Description of Impact	Residual Significance
Air quality	Reduced ambient air quality caused by vehicles and machinery involved in dismantling activities	Minor
Noise	Noise emissions from dismantling equipment	Minor
Soil	Soil degradation and contamination during decommissioning	Negligible
Ground water	Groundwater degradation and diversion from excavation and spillage of hazardous material during decommissioning.	Negligible
Surface water	Disruption and contamination of storm water runoff from excavation and hazardous material spills during decommissioning	Negligible
Landscape and Visual	Reduced landscape aesthetic from material laydown area and dust generation during decommissioning.	Negligible
Terrestrial Ecology and Habitats	Disruption to terrestrial ecology and habitat from waste and spillage of hazardous material decommissioning	Negligible
Seawater & Sediment Quality	Degradation of seawater quality due to vessel operations and storm water run off	Negligible
Marine Ecology and Habitats	Degradation of marine habitat quality and ecosystem function decommissioning activities	Negligible
Protected Species / Critical Habitat	Impacts to protected species and critical habitat from underwater noise and ship strikes	Negligible
Livelihood and Local Economy	Temporary direct and indirect employment opportunities (primarily unskilled)	Positive
	Temporary economic impacts from taxes and fees, procurement and worker spending	Positive
Workers Management	Workers' Rights	Minor
Community Health, Safety and Safety	Increased transmission of communicable diseases	Minor
	Increased pressure on health care	Minor
Traffic and Transport	Disruption to existing road users on local roads during decommissioning	Minor
Community Cohesion and Expectations	Unmet expectations of benefits	Minor

MARSA LNG LLC shall implement the following measures to mitigate the impacts identified and presented in Table 6.1 to Table 6.3 above:

- With regard to air quality:
  - Air emission specifications in compliance with best practice and legal requirements will be considered during all equipment selection and procurement;

- Available fuels with minimum sulphur content will be used;
- Regular maintenance (as per manufacturers recommendations) of vehicles, machinery, and equipment in order to minimise the generation of air pollutants;
- Flaring will only occur during the start-up, shut down and in emergency situations, entailing the plant to be zero-flaring plant during normal operations, where all the normal sources of flare gas have been eliminated in the design stage. Emissions from flaring during the initial start-up will be reduced with the use of nitrogen;
- Atmospheric emissions from all transport vehicles used during the different phases of the Project will be reduced by minimizing the number of journeys as far as possible; and
- A solar plant is planned to be constructed as an offset solution to compensate the GHG Scope 2 emissions of the LNG plant. It will be constructed on a different plot and will be the subject of its own EIA process.

- With regard to noise:
  - Develop and implement a traffic management plan to minimise as far as practicable noise generated by construction traffic;
  - Develop and implement an appropriate vehicle and equipment maintenance program;
  - Use of best available technologies and implementation of industry best practices;
  - Install equipment for noise reduction (i.e., mufflers) and minimise machinery noise (turn off machines when they are not in use);
  - Reduce use of noise generating equipment during holiday and night-time and locate said equipment as far as possible from receptors; and
  - Noise will be monitored during the construction phase (including in sensitive receptors such as Majis village) to provide an extended profile of ambient noise at the project boundary and at receptors. Noise monitoring will be carried out during the subsequent operation and decommissioning phases.
- With regard to terrestrial ecology and habitats:
  - Develop and implement waste management plan defining measures to reduce, re-use, collect, manage, recycle and dispose of waste in an appropriate manner and in accordance with good international practice
  - MARSA LNG LLC shall engage with SIPC to develop and implement a biodiversity management plan that includes a bird monitoring programme to assess the effect of flaring though engagement with SIPC and other industries carrying out flaring in the SIP area and put in place appropriate mitigation measures.
  - Develop and implement emergency response plan including response measures in the event of any leaks and spills;
  - Lighting levels will be minimised, eliminating unnecessary lighting and use proper orientation of lighting to reduce nightglow and visibility of the LNG plant.
  - Avoid start-up/shutdown flaring at night and minimise lighting levels.
- With regard to marine ecology and habitats:
  - Develop and implement, a pollution prevention and control management plan including management of hazardous materials, and MARSA LNG LLC shall engage with SIPC to implement a biodiversity management plan that includes a ballast water management and an alien invasive species management and monitoring plan;

- The biodiversity plan should also involve a system for approaching ships to report whale sightings, temporary and localised speed restriction zones on approach, training and awareness raising about identifying sensitive species and the issue of ship strikes;
- MARSA LNG LLC shall engage with SIPC to maintain correct storage, treatment and disposal of operational facility and vessel waste water streams and discharges, including storm water systems; and
- MARSA LNG LLC shall engage with SIPC with regards to the environmental standards and procedures applied to the LNG terminal operations and to Sohar Port generally, including: the establishment of “low power propulsion zones” and management of wildlife collisions.

- With regard to health, safety and security:
  - Safety Risks due to increased marine traffic and vessel collisions, Increased transmission of communicable diseases and Increased pressure on health care, applicable to construction and operation phase;
  - MARSA LNG LLC shall engage with SIPC to develop and implement a workers management plan, a community health and safety management plan, a traffic management plan, a stakeholder engagement plan and a marine traffic management plan.
- With regard to community cohesion and unmet expectations in terms of accessing Project benefits:
  - Develop and implement a stakeholder engagement plan and a grievance mechanism, a workers management plan, a social investment plan and community needs assessment.
- With regard to local economy and employment:
  - Develop and implement a Detailed Industrial Baseline Survey (IBS) and a Local Content and Procurement Plan to maximize workforce, goods and services on the Project and develop capacity among the employees and the local suppliers;
  - Develop and implement a stakeholder engagement plan and grievance mechanism.
- With regard to workers management:
  - Workers’ rights, child labour and forced labour in the supply chain, applicable to construction and operation phases;
  - Develop and implement an occupational health and safety plan, workers management plan, workers grievance mechanism and stakeholder engagement plan.
- With regard to cumulative impacts:
  - To mitigate the cumulative effects on the physical, biological and socioeconomic environment derived from the development of several projects in a given area, MARSA LNG LLC will use their best efforts to engage other developers, governments, and other stakeholders by acknowledging the cumulative impacts and risks and suggesting coherent management strategies to mitigate them.
- With regard to accidental related impacts (uncontrolled loss of containment at the LNG plant or a spill offshore):
  - MARSA LNG LLC will develop and implement an Emergency Response Plan (ERP) that will provide guidelines related to emergency management and response which can be deployed by MARSA LNG LLC when a significant incident or accident has occurred, or is likely to occur, during project operations.

7 FRAMEWORK ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The Environmental and Social Management Plan (ESMP), which is an integral component of the ESIA Report, provides the framework to support the implementation of the mitigation and preventive measures identified in the ESIA process. The specific objectives of the Framework ESMP are to:

- Document the more general aspects of MARSA LNG LLC approach to environmental and social management,
- Describe how the project's environmental and social impacts will be minimised and mitigated and positive impacts enhanced during project planning and implementation,
- Detail the programme that will monitor and report the project's effects and its compliance with regulatory and corporate requirements,
- Provide a framework for the development of detailed implementation plans by contractor(s).

Furthermore, the ESMP provides outlines of specific management plans that will be detailed and operational prior to the starting of the activities, in order to address potential environmental and social impacts. In addition, MARSA LNG LLC will implement a Management of Change procedure, in order to identify gaps and uncertainties and to take them into account when they arise. The objective of the procedure is to ensure that the impacts of change are identified and assessed prior to changes being implemented.

Based on the impact assessment, the following specific management plans will be developed for the Project, following the ESIA stage:

- Traffic Management Plan;
- Water Management Plan;
- Pollution Prevention and Control Plan;
- Waste Management Plan;
- Hazardous materials management plan;
- Sediment and storm water management plan;
- Stakeholder Engagement Plan (already in place, to be further updated as the Project progresses);
- Community Grievance Mechanism;
- Industrial Baseline Survey and Local Content Plan;
- Workers' Management Plan;
- Occupational Health and Safety Plan;
- Community Health and Safety Management Plan;
- Social investment benchmarking and community needs assessment;
- Emergency Response Plan; and
- Decommissioning Plan.

The following plans will be established through engagement with SIPC and other tenants where applicable: Biodiversity Management Plan, the Ballast Water Management Plan, the Alien Invasive Species Management Plan and the Marine Traffic Management Plan as these refer to marine traffic, vessel movements and operations inside the port area. In addition, the development of plans such as health and safety plans and the influx management plan be carried out with the support of government to mitigate cumulative impacts.

- In addition, environmental, social and health monitoring activities will be carried out during the whole life of the Project. The basis and guidelines for monitoring activities shall be defined at every

stage of the Project cycle and will aim to provide reference to evaluate the effectiveness of the implementation of environmental management plans and any needs for improvements in these plans, in an effort to minimize the significant negative impacts.

An Offshore Environmental Monitoring Plan (jetty and vessels loading or bunkering activities), Onshore Environmental Monitoring Plan (LNG Plant) will be prepared to ensure compliance with regulatory requirements as well as to evaluate the effectiveness of operational controls and other measures intended to mitigate potential impacts.