

**REQUEST FOR EXPRESSIONS OF INTEREST
(CONSULTING SERVICES – CQS) TÜRKİYE**

EU Instrument for Pre-Accession (IPA) Energy Sector Program Phase III Project

Grant No.: TF0C3092

Assignment Title: “Feasibility of Flare Gas Recovery System at the Marmara Ereğlisi LNG Terminal of Petroleum Pipeline Corporation (BOTAS)”

Reference No: CS-01

The Ministry of Energy and Natural Resources (MENR) has received a grant from the European Union toward the cost of the EU Instrument for Pre-Accession (IPA) Energy Sector Program Phase III Project, and intends to apply part of the proceeds for Consulting Services.

The Consulting Services (“the Services”) include the Feasibility of Flare Gas Recovery System at the Marmara Ereğlisi LNG Terminal of BOTAS with the aim of increasing energy efficiency through recovery of the flare gas of related terminal.

The studies include:

1. Preparation of a Feasibility and Recommendation Report of the FGR System
2. Proposed Next Steps in accordance with the results of Task-1:
 - 2.a. Engineering Works and Detailed Engineering of the FGRS, Market Research and Technical Specifications Report ¹
 - 2.b. Preparation of a Feasibility and Recommendation Report of the Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal ²
3. Technical Visit and Workshop

The detailed Terms of Reference for the assignment is attached as Annex.

The MENR now invites eligible consulting firms (“Consultants”) to indicate their interest in providing the Services. Interested Consultants should provide information demonstrating that they have the required qualifications and relevant experience to perform the Services. The shortlisting criteria are:

¹ This sub step is implemented if the result of the Task 1, FGR system feasibility and evaluation report is feasible and applicable.

² This sub step is implemented if feasibility and evaluation report is not feasible nor applicable.

- The Consultants should be in the consulting business for not less than the last 5 years prior to deadline for submission of interests;
- The Consultants should have specific experience within the last 3 years prior to deadline for submission of interests in each of
 - Experience in the design, installation, or improvement of plumbing, equipment, or systems in LNG facilities,
 - Experience in energy efficiency applications for natural gas facilities, experience in flare gas recovery systems is preferable,
 - Experience in conducting comprehensive technical feasibility studies,
 - Experience in conducting comprehensive financial and economic feasibility studies, including preparation of detailed reports involving key financial metrics (ex. Profitability Index, Payback, IRR; ERR, etc.),
 - Experience in engineering works and detailed engineering for natural gas facilities, experience in LNG facilities is preferable,
 - Staff capacity in the above mentioned areas;
- The Consultants should demonstrate availability of and/or access to the key experts for the performance of the services described in the TOR (e.g., by providing a list of key experts they are working with),
- The Consultants should demonstrate sound administrative and financial capacity.

Key Experts will not be evaluated at the shortlisting stage.

The attention of interested Consultants is drawn to Section III, paragraphs, 3.14, 3.16, and 3.17 of the World Bank's "*Procurement Regulations for IPF Borrowers*" November 2020 ("*Procurement Regulations*"), setting forth the World Bank's policy on conflict of interest.

<https://pubdocs.worldbank.org/en/178331533065871195/Procurement-Regulations.pdf>

Consultants may associate with other firms to enhance their qualifications, but should indicate clearly whether the association is in the form of a joint venture and/or a sub-consultancy. Experiences of the sub-consultants will not be considered during the evaluation phase. In the case of a joint venture, all the partners in the joint venture shall be jointly and severally liable for the entire contract, if selected. Interested consultants should clearly indicate the structure of their "association" and the duties of the partners and sub consultants in their application. Unclear expression of interests in terms of "in association with" and/or "in affiliation with" and etc. may not be considered for short listing.

A Consultant will be selected in accordance with the Consultants Qualification Selection (CQS) method set out in the Procurement Regulations.

Further information can be obtained at the address below during office hours from 10:00 a.m. to 4:00 p.m. Türkiye time.

Expressions of interest must be delivered in a written form to the address below in person, or by mail, or by e-mail until 22 April 2024 at 2:00 p.m. by local time.

Address:

Ministry of Energy and Natural Resources
General Directorate of Foreign Relations
Foreign Investment Coordination Department (Project Implementation Unit)

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ANNEX

REPUBLIC OF TÜRKİYE MINISTRY OF ENERGY AND NATURAL RESOURCES EU/IPA ENERGY SECTOR PROGRAM PHASE II PROJECT

TERMS OF REFERENCE (TOR)

CS-01

CONSULTING SERVICES FOR

FLARE GAS RECOVERY SYSTEM AT BOTAŞ

1. INTRODUCTION

Türkiye's energy sector is in a transition to ensure self-reliance, robustness, diversification, supply security, competitiveness and low-carbon energy in compliance with its national objectives. So far, the sector has been driven by two major characteristics: growing energy demand and import dependency, both of which are impacted by steady economic development with 5% annual growth on average coupled with sectoral leaps in energy. To tackle these challenges, Türkiye has had its own circumstantial energy transition phases, the first of which lasted a decade over the period of 2001-2016. During this first stage, Türkiye introduced radical reforms and restructuring in the energy sector including independent regulation of the sector by the Energy Market Regulatory Authority, enabling a level playing field for new market entrants, liberalization in power generation, distribution and trade as well as gas distribution and retail, and stepping up efforts to support the growth of renewable energy sources like solar and wind. Ensuring non-discriminatory access to energy markets mobilized sizeable private sector investments and involvement in energy activities. Since then the installed capacity in energy generation, for instance, has almost tripled and the energy landscape of Türkiye's consumption and power generation patterns has altered.

Having reached a certain maturity threshold with the introduction of the Energy Exchange Istanbul (EPIAS) for electricity and natural gas transactions, Türkiye has stepped into the second phase of the energy transition which is mainly inspired by the National Energy and Mining Policy Strategy announced in 2017. This new stage emphasizes the three main pillars of the Strategy, which are (i) reinforcement of security of supply, (ii) localization through renewable and domestic sources and (iii) enhancement of predictability in the market. Cross-cutting these pillars; market reforms, utilization of renewable resources, improvement of energy efficiency, deployment of new technologies and new infrastructure investments are the main objectives of Türkiye's policy. In December 2022, Türkiye announced the National Energy Plan (NEP) which will guide the energy sector through 2035. The NEP prospects to reach a total installed electricity generation capacity of 189.7 GW, that is, 96.9 GW of additional capacity, and a share of renewables of 64.7% of this installed capacity. Furthermore, the energy intensity of the Turkish economy is expected to decrease by 35.3% in this period.

Türkiye has ratified the Paris Agreement and set a net zero target by 2053 in line with its objectives. Within its Nationally Determined Contribution (NDC), Türkiye submitted its target to reach 41% reduction in GHG emissions from BAU levels by 2030. In line with these targets, relevant measures formulated by Türkiye include increasing the current solar power capacity to 10 GW and

wind power capacity to 16 GW by 2030, reaching a 38.8% renewable energy share in electricity generation by 2030, tapping the full hydroelectric potential, reducing electricity transmission and distribution losses to 15% by 2030, rehabilitation of public electricity generation power plants and establishment of micro-generation, co-generation systems and auto production of electricity. Within this framework, under the 11th National Development Plan (2019-2023) 13 targets encompassing energy markets, demand side participation, rehabilitation of power plants, carbon emission control, grid integration of renewables, energy storage systems, energy efficiency, smart grid applications, reinforcement and flexibility of power and gas grids, and gas storage and LNG capacity enhancement were identified. Additionally, the Climate Change Strategy (CCS) 2010-2023 sets a target to increase the share of renewable energy in total electricity generation up to 30% by 2023 by fully utilizing technical and economic hydro potential, raising wind electricity generation capacity to 20 GW and geothermal electricity generation capacity to 600 MW and supporting electricity generation from solar energy. These targets are also reflected in several action plans, e.g., Strategic Plan of Ministry of Energy and Natural Resources for 2019-2023, National Energy Efficiency Action Plan (NEEAP) 2017-2023 and Climate Change Action Plan (CCAP – 2011-2023).

In this context, BOTAS, the national natural gas transmission system operator (TSO) and wholesale gas company of Türkiye plans to invest in a Flare Gas Recovery (FGR) System at its Marmara Ereğlisi LNG Terminal to save emissions and increase energy efficiency. The initiative to develop an FGR system techno-feasibility assessment and design is in line with the priorities identified for the energy sector under the revised Indicative Strategy Paper for Türkiye for the period 2014-2020. As such, relevant IPA II financial assistance will be channeled for the following program objectives:

Promotion of the renewable energy and energy efficiency: harmonizing renewable energy and energy efficiency legislation with the EU acquis; building capacity to implement energy efficiency programs and renewable energy programs; increasing the technical capacity of energy service companies (ESCOs); supporting SMEs and micro enterprises to improve competitiveness; developing infrastructures to measure, monitor and report on energy savings and greenhouse gas emissions; and raising awareness and disseminating information on energy efficiency targeted to industry, commerce and households, promoting of renewable energy and energy efficiency applications in public buildings, facilities and municipal services including green transportation, and supporting energy efficiency in electricity and gas transmission/distribution grids and generation plants.

Market integration and development of infrastructures: IPA II assistance will support the modernization and upgrading of the Turkish electricity network in line with the European Network of Transmission System Operators for Electricity (ENTSO-E), and of the Turkish Gas Transmission System in line with the European Network of Transmission System Operators for Gas (ENTSO-G), including soft supply equipment for Supervisory Control and Data Acquisition (SCADA). Technical assistance will be needed for harmonizing Turkish gas and electricity codes with relevant EU network codes and for acquis alignment in the areas of electricity and gas.

The European Commission (EC, for the European Union) and the Ministry of Foreign Affairs (for the Government of Türkiye) have signed a Financing Agreement under EU's 2018 Instrument of

Pre-Accession Assistance (IPA) program to Türkiye. The execution of the project will be led by the Ministry of Energy and Natural Resources (MENR) and administered by the World Bank (WB). An Administration Agreement between the EC and WB was signed on December 2, 2022 to finance the implementation of the project and, a Grant Agreement between the MENR and WB will be signed until August 2023.

2. BACKGROUND

BOTAS was established on August 15, 1974 to transport crude oil with the aim of diversifying Türkiye's energy sources. Since 1987, it has engaged in natural gas transportation and trade activities as well and has become the leading company in the natural gas and crude oil sectors.

Türkiye safeguards energy supply routes and develops active policies related to energy efficiency. Türkiye's natural gas transmission system includes many variables and constraints; hence the main transmission system must be constantly examined to create a powerful and efficient energy infrastructure.

BOTAS operates in the natural gas and petroleum sectors in the areas of,

- Transportation of natural gas and crude oil through pipelines,
- Export, import, marketing and trade of natural gas,
- Surveying, engineering and construction of pipelines.

BOTAS' mission is to create competitive advantage by using knowledge, productivity and applying high technology within the framework of international quality standards, as well as supplying energy to national and international markets as a financially and institutionally strong company.

BOTAŞ, the sole proprietor of the existing Turkish natural gas transmission network infrastructure, reinforces the capacity of the gas grid through investments in order to ensure that the network operates in accordance with EU network codes, in relation to Türkiye's aim to increase the ability of integration into the European natural gas market.

In this context, it is vital that BOTAŞ provides smooth and reliable natural gas supply for the domestic gas market and at the same time contributes to the security of European gas supply.

BOTAŞ has more than 15.000 km of high-pressure natural gas transmission pipelines, 9 compressor stations, and more than 320 delivery points, as well as metering stations, valves and pig launching/receiving facilities. Additionally, BOTAŞ has 1 FSRU and 1 onshore LNG Terminal (Marmara Ereğlisi LNG Terminal) which are also important parts of the whole infrastructure.

BOTAS' vision is to turn Türkiye into an energy corridor for oil and gas, utilizing national and international cooperation opportunities, and becoming a notable company in the world, a leader in the region and a trendsetter in the sector.

The BOTAS Marmara Ereğlisi LNG Import Terminal was built in line with Türkiye's natural gas supply security and diversification policy.

The Marmara Ereğlisi LNG Terminal is 85 km away from Istanbul, 40 km from Tekirdağ, 20 km from Çorlu Airport and 4 km away from Marmara Ereğlisi city center.

History of the terminal:

1985 – Started basic design and engineering works

1989 – Started the construction of the LNG terminal

1994 – The construction of terminal was completed

2001 – Started the extension project

2002 – LNG truck loading operations started

2014 – Started a jetty extension project

2016 – Jetty extension project completed

2017 – Send-out capacity increase

2019 – LNG reloading project

The main functions of the terminal are

1. LNG ship unloading and storage,
2. Re-gasification of stored LNG and natural gas send-out to the main transmission line,
3. LNG truck loading
4. LNG reloading

The terminal originally has a maximum design regasification capacity of 685.000 Sm³/hour, 17 million Sm³/day and 5,5 billion Sm³/year. With completion of the send-out increase project it reached a level of 37 million Sm³/day and 12 billion Sm³/year.

The terminal originally had 380 m long jetty where up to 160.000 m³ LNG carriers can berth, after the jetty extension project in 2016 the jetty reached 440 m length and is compatible for Q-max and Q-flex vessels with the largest cargo capacity in the industry up to 270.000 m³.

There are 3 LNG storage tanks, each of which has a capacity of 85.000 m³, with a total capacity of 255.000 m³. Tanks are of a double-containment type. There is a 70 cm thick concrete protection dike surrounding each tank.

In addition, it is possible to deliver natural gas to the regions where natural gas cannot be delivered by pipelines. In 2002, a land tanker LNG filling station was installed in the Terminal. Currently in the terminal, a maximum of 75 tankers can be filled daily in three LNG land tanker filling ramps used.

In 2021, the first phase of the LNG reloading project was completed. The terminal has the capability to reload conventional LNG carriers at a flowrate up to 2000 m³/h. The second phase of the project, reloading small scale LNG bunkering vessels, is scheduled to be complete in 2023.

Due to a variety of processes at the terminal, LNG continuously evaporates at temperatures above its boiling point, generating boil-off gas (BOG). BOG must be either removed from the process or recovered back into the system to prevent over pressurization.

A gas flare is a burner to burn associated, unhandled or excess gases and liquids released during normal or unexpected excess pressure in operation in many oil and gas industrial processes, such as refineries, as well as chemical plants and the coal industry. Gas flaring is a significant source of greenhouse gases emissions and a major contributor to air pollution and acid rain. It also generates ambient noise, heat and renders large areas uninhabitable. Therefore, a reduction of gas flaring is a crucial issue; there is an urgent need to measure flared gas in terms of composition and volume, and to establish whether it makes sense to install a flare gas recovery system or another way to dispose of the gas. It will be interesting to better understand flare gas measurement techniques and to know more about different kinds of flare gas recovery systems.

Flared gas is typically considered to be a waste. In the oil and gas industry, a flare is an essential safety system, used for the safe disposal of flows from pressure safety valves and depressurization of processing equipment.

During the gas extraction and their refining processes, a large volume of gases is not used and will be sent to the flare. If a flare gas recovery system (FGRS) is used, then wasted energy can be recovered and the emission of greenhouse gases can be prevented.

Flare Gas Recovery (FGR) is the process of recovering the waste gases that would normally be flared, so they can be used as fuel gas elsewhere in the facility. This results in reduced emissions and cost savings.

Every refinery has a pressure relief and flare system to enable safe handling and disposal of hydrocarbon vapors and liquids. The flare gas recovery system (FGRS) provides many benefits to the end user, including a reduction of plant fuel and steam consumption, an increase in flare tip life, a rapid return on investment, a decrease in plant emissions and a reduction in continuous flare operation.

A variety of strategies exist for minimizing flaring. These strategies include the use of plant practices and existing equipment to control processes that produce waste gases. Equipment must be properly maintained to minimize leaks into the waste gas header. Another strategy encompasses an improved understanding of how waste gases are produced under a given set of conditions, so that those conditions can be avoided.

This might mean recycling waste gases back into the process or using alternative technologies that produce less waste.

In the Marmara Ereğlisi LNG Terminal, the philosophy of the flare system can be explained as protection of unexpected over pressurizing of storage tanks, pipes and other equipment.

Equipment and piping containing LNG may be subjected to higher than normal pressures due to

- Thermal exposure
- Inadvertent closure of isolation valves
- Emergency shutdown isolation
- Failure of utilities, cold circulation pumps or control systems

When high pressure conditions occur, relief valves installed on piping and storage tanks open and undesired gas is evacuated to the flare stack.

Unwanted gas in the flare system is burned in the flare stack. The flare stack consists of a vertical column which contains the flare gas pipe, molecular seal and the flare tip. To ensure a complete burning of flare gas, there are three continuous burning pilot burners at the top of the stack.

With the existing flare system, there is a significant amount of gas burned in the flare stack annually. In this project, BOTAS would like to find out whether a flare gas recovery system is suitable for Marmara Ereğlisi LNG Terminal both technically and economically.

3. OBJECTIVES OF THE STUDY

The first objective of the project is to gain knowledge about different kinds of FGRS and energy efficiency at LNG terminals, to obtain a recommendation for a suitable FGRS and/or other efficiency technologies for the Marmara Ereğlisi LNG Terminal of BOTAS and to assist BOTAS in making an investment decision on FGRS. The goal is to evaluate whether the installation of the FGRS is technically, economically and environmentally reasonable or not.

The second objective is to create awareness on the subject via a workshop under Task-3 for interested parties who can benefit from the FGRS systems and/or other technologies. The project is intended to create a good working example for the parties who can use the system in the Oil and Gas Industry. Additionally, the study, which is carried out to reduce carbon emissions, is aimed to create social awareness for relevant stakeholders.

The third objective is enhancement of institutional capacity of BOTAS. As described under Task-1, The Financial Feasibility Training is expected to improve relevant skills of BOTAS personnel.

4. SCOPE OF WORK

For the fulfillment of the tasks described below, close cooperation with the main beneficiary BOTAS is strictly necessary. Hence, a Working Group shall be dedicated by BOTAS to observe and learn from the work of experts of the project at every stage of the assessment, including field work for data collection, use of software and models to analyze and assess the systems, and drafting reports and investment plans. In order for a working group composed of BOTAS personnel to participate in the studies as an observer, BOTAS will provide an office room with projectors to enable the experts to connect their computers while working. The Consultant shall share the content and function of all methodologies, models and software as well as documents used for studies and project activities with BOTAS. Apart from the field work and assessment studies at BOTAS premises, the Team Leader specified under Section 7 of these ToR shall attend 2-day

meetings each month with BOTAS to discuss progress and assessment studies conducted by experts and BOTAS Working Group.

These monthly meetings shall be arranged only for the following activities and 2 times for each throughout the implementation of project:

- Preparation of Feasibility and Recommendation Report of the FGRS
- Engineering Works and Detailed Engineering of the FGRS **or** Preparation of Recommendation and Detailed Reports of the Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal
- Preparation of Market Research and Technical Specifications Reports

These monthly meetings may include other relevant stakeholders whenever needed throughout the project implementation to exchange information and to discuss progress and outcomes of studies.

A one-day opening event will be held at a 4-star hotel in Ankara for all the five contracts including this one that will be implemented under IPA 2018 Energy Sector Program Phase 3 Project. The venue, catering, interpretation and other organisation related costs will be borne by the Consultant of one of the other contracts. The Consultant of this contract will be responsible for providing input to the organisation of the event such as provision of input to participant list and provision of input to promotional materials to be produced for this event. The Consultant will also make a presentation about its contract and/or may be asked to participate in a round table type-like session.

After the approval of all deliverables and reports, a half-day closing event will be also held on an online platform which includes simultaneous interpretation capability. The Consultant of this contract will be responsible for the organization of the event and will arrange and cover the cost of the online platform as well as, translation and interpretation. The Consultant will make presentation(s) about all the results and main take-aways of the contract.

BOTAS will decide on the scope and limits of data to be shared with the Consultant and will share the data with the Consultant through MENR. The Consultant shall not disclose any data provided under this project to third parties and shall not use them for its own work out of the scope of this project.

The project is composed of three tasks:

Task-1: Preparation of a Feasibility and Recommendation Report of the FGR System

Task-2: Proposed Next Steps in accordance with the results of Task-1

Task-3: Technical Visit and Workshop

Section 4.1: Task 1 - Preparation of a Feasibility and Recommendation Report of the FGR System

The scope of the consulting services will include a feasibility study for a “Flare Gas Recovery System”. The main objective of the task is to evaluate the integration of an FGRS in to the BOTAS’ LNG facility. The study shall include but not be limited to and serve the following:

- The contactor shall arrange a 3-day online Financial Feasibility Study training with 30 participants on how to conduct technical, financial and economical feasibility study. The scope of the training should include but not be limited to project evaluation techniques (NPV, Profitability Index, Payback, IRR , ERR, etc.), making comparison and decision on one or multiple projects and difficulties encountered in practice. The complete training program should be recorded audio-visually and such records should be delivered to BOTAS.
- Examining flare gas reduction methods/systems and evaluating which ones are technically applicable to BOTAS LNG facility.
- Evaluating flare gas reduction methods/systems in terms of process safety.
- Collection of the required data from the site.
- Evaluation of practicality and desirability of the FGRS in BOTAS LNG Terminal.
- Review of the current flare gas system and its importance for the terminal.
- Evaluation of the integration of a potential Flare Gas Recovery System by preparing a techno-economic feasibility study.
- Evaluation of Environmental and Social Impacts of flare gas and potential benefits of installing FGRS on LNG Facility of BOTAS.
- Evaluation of the existing facility on the basis of area/settlement.
- Determining the risk factors with Fiscal Risk Assessment and Risk Assessment (Non-financial).
- Identification and analysis of the relevant stakeholders.
- Planning to focus on whether there are characteristics of the potential E&S risks and values sensitive to project impacts.
- Planning and evaluation if there are grievances for the flare gas.
- Implementing the mitigation hierarchy regarding assessment and planning.
- Preparation of Recommendations.

The Feasibility and Recommendations Reports for implementation of Flare Gas Recovery System to the BOTAS LNG facility shall be prepared and submitted.

A training report shall be prepared and submitted after the training on how a financial feasibility study for investment decision was conducted.

Section 4.2: Task-2 - Proposed Next Steps

This task consists of 2 different section. The scope of the Task 2 presented under heading 2a if the result of the Task 1, FGR system feasibility and evaluation report is feasible and applicable, or under heading 2b if feasibility and evaluation report is not feasible nor applicable.

Task 2.a. Engineering Works and Detailed Engineering of the FGRS, Market Research and Technical Specifications Report

When the result of the 1st task, FGR system feasibility and evaluation report is feasible and applicable the main objective of this task will be the preparation of Engineering Works and Detail Engineering of FGR System report according to the results of Feasibility Report where an applicable FGR System is decided. Additionally, market research and technical specifications reports shall be prepared under Task-2.

The scope of consulting services will include engineering works and detail engineering of the FGRS System through;

- Defining process description for FGRS
- Identifying design parameters
- Determining equipment scope for FGRS
- Determining overall FGRS equipment specifications
- Determining overall FGRS equipment design criteria, construction properties, materials, quantities. (Equipment specification sheet)
- Determining testing, NDE (non-destructive testing evaluation) and inspection specifications for components
- Determining appropriate control system. (Full and complete PLC based control systems)
- Determining Monitoring System Type. (Flare gas flow monitor and Gas Chromatograph)
- Making approximate cost calculation for Installation costs (Direct installation costs cover foundations and supports, equipment handling and erection, piping, insulation, painting and electrical. Indirect installation costs cover engineering, construction and field expenses, labor costs, contractor fees, start-up, and performance testing)
- Preparation of Emergency Procedures
- Making risk analysis
- Calculating the Total Capital Investment (TCI) Cost and Return on Investment
- The Consultant shall prepare the Technical Specifications (TS) for the components/software/systems/interfaces which are determined to be supplied as a result of needs assessment studies:
 - The described standards and the technical specifications should not hamper competition during a tender;
 - All essential technical and performance characteristics and requirements should be described.
- The Consultant shall also conduct market research in relation to the components/software/systems/interfaces of which technical specifications are identified. The market research shall provide comprehensive data and detailed commentaries on relevant market conditions and show the items to be supplied by stating brand name, models, suppliers and estimated costs

Engineering Works and Detail Engineering of FGR System Report and Market Research and Technical Specifications Report shall be prepared and submitted by the Consultant.

Task 2.b. Preparation of a Feasibility and Recommendation Report of the Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal

If the 1st task, FGR System feasibility and evaluation report is not feasible or applicable, then the next task, the detailed engineering study, will not be carried out. Instead, the scope of the consulting services will include a study for Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal. Recommendation Report covering but not limited to the following topics will be prepared.

- Preparing a carbon footprint calculation report for the facility and presenting recommendations for reducing the carbon footprint
- Investigation of new flare systems and their applicability in the plant
- Investigation of feasible revisions on the existing flare system in order to reduce the amount of burning gas in the flare, taking into account process conditions and process safety
- Investigation of green ports in the world and their applicability in Türkiye
- Investigation of existing terminals completed their green transition according to carbon emission reduction and energy efficiency goals
- Presentation of applicable energy efficiency technologies at Marmara Ereğlisi LNG Terminal.
- Preparation of the Detailed Report of the proposals selected by BOTAŞ according to Recommendation Report. Detailed Report shall include but not be limited to a market research.

4.3. Task-3: Technical Visit and Workshop

In this phase BOTAS's aim is to observe similar projects from all aspects including planning, costs, characteristics, operability etc. In this way BOTAS will find an opportunity for understanding the process at all levels and getting knowledge about the functioning of machines and systems. Therefore, the technical visit and workshop are aiming to share knowledge and increase awareness on the topic.

1-day long workshop will host approximately 40 participants. The participants could be potential FGRS users (like upstream and downstream petroleum and natural gas sector companies, petroleum refineries etc.), LNG terminal operators, MENR etc.

The objective of the workshop is to review flare gas and its impacts to increase awareness and share knowledge on the topic with relevant stakeholders, hear their views and provide information. The workshop shall include but not limited with the followings:

- Review of good and operational FGR examples in the world
- Review of the latest and advanced technologies in the field of energy efficiency at LNG terminals.
- Review of environmental impacts of flare gas
- Review and discussion on the results of the Feasibility and Recommendations Study.

3 professionals on abovementioned issues (international where appropriate) will be invited for sharing his/her valuable personal experience.

Other details related to the content of activity program will be determined by the Consultant and BOTAŞ.

The workshop will be held in Ankara or İstanbul at a 5-star hotel or equivalent with free Wi-Fi connection and meeting room utilities (projection machine, pens and papers, sound systems, simultaneous translation system etc.). All organizational expenses together with accommodation and travel cost of the participants attending from out of event location and venue with breakfast & lunch & dinner & refreshments (all day long) will be paid from the project budget.

The Consultant is expected to arrange and deliver 1 technical visit to a company in countries like Belgium, Spain and Netherlands that applies the latest and advanced technologies in the field of energy efficiency and/or has a good working example of an FGR system and the technical visit will be 4-days long including travel days. The Facility of the company could be an LNG Facility (preferably) or a petroleum refinery or a facility of an upstream company where an FGR System is operational. Up to 10 personnel from related departments of BOTAS, 2 personnel from MENR and the Team Leader will attend. The main objective of the visit is to see practical examples to understand how the FGR system is integrated to the process safely and how effective is the system. Meeting with the staff and listening their experience on FGR system to understand how the project work on paper and on the field.

The details of the technical visit such as country, institutions to be visited, materials to be handed-out, content, program etc. will be submitted by the Consultant to BOTAŞ at least 6 weeks before the visit and the visit program shall be finalized and approved by the BOTAŞ at least 2 weeks before each visit.

5. ENVIRONMENTAL AND SOCIAL ASSESSMENT

Global warming and environmental pollution are of great concern in today's world. One of the major environmental problems related to the gas and oil industry is CO₂ released to the atmosphere by flaring.

It is an opportunity to cut greenhouse gases (GHGs) from oil and gas processing plants through a flare gas recovery (FGR) process. Flare gas recovery, rather than burning, could be economically beneficial for the company. The output of the FGRS may have a significant impact for refineries towards both economic and sustainability towards greening. Today, flaring has been described broadly as a 'multibillion-dollar waste and local environmental catastrophe'. Environmental issues of gas flaring are generally described in terms of efficiency and emissions. Flaring can be inefficient especially with combustion being affected by ambient winds and several other factors leading to incomplete combustion.

Flaring is not only squandering the significant quantity of precious energy but also endangering the environment by spawning toxic venoms.

Attention to environment-friendly greening effect and value of preserving primary resources are the two factors which make it necessary to minimize flaring in accordance with practical considerations and constraints.

Environmental and social assessment of this project will be carried out by the environment specialist and social specialist specified in section 9.

5.1. Environmental and Social Objectives

BOTAS has made commitments to act in accordance with national and international regulations and other conditions in all its activities and projects and fulfills all the requirements of these regulations and other conditions. In addition, with its expert crew in these matters, all legislation and other conditions are followed up to date and adaptation to changing conditions is achieved immediately.

In 2019 BOTAS was the pride of Türkiye with 4 awards (including the award received in the carbon emission reduction category) in one of the world's most prestigious environmental awards, "Green World" honors. With its successful environmental projects, BOTAS has also been awarded the title of "Yeşil Dünya Elçisi" (Green World Ambassador).

In 2020, BOTAS with its corporate environment and sustainability policies; It was deemed worthy of the "Sustainable Leadership" award at the Sustainability Awards organized by the BIG-Business Intelligence Group within the scope of ISO 50001 Energy Management Systems and prevention of carbon emissions. Immediately after, BOTAS was awarded 6 awards by Green Organization within the scope of 2020. These awards are in the categories of environmental policy, pollution and emission control, sustainability, energy management, waste management and carbon reduction.

In 2023, BOTAŞ was awarded 5 Green World Awards by Green Organization in the categories of biodiversity, sustainability and environmental improvement.

In line with these goals, even if the scope of this project does not cover the investment and implementation of the FGR system yet, BOTAS aims to be aware of the potential impacts of the proposed investment and be well-prepared for keeping them under control earlier. In this context, in the Feasibility and Recommendation Report under the Task 1, the potential impacts for environment and society shall be evaluated in case of the implementation of the FGR system, and mitigation measures shall be identified for these. As seen in the Annex 1, it can be seen that installation of FGRS will only affect the Flare Stack and Flare Stack related systems and it will not directly affect the main operations in and around the facility.

As per the Environmental and Social Commitment Plan published on MENR's website (<https://enerji.gov.tr/announcements-list>) The Environmental and Social Assessment will be in line with Relevant National Legislation, WBG Environmental and Social Framework and ESHS Guidelines and will commensurate the level of a feasibility study. MENR's PIU will supervise the Consultant regarding the compliance with the ESHS specifications throughout project implementation.

The Conceptual ESIA would include the following:

- Executive Summary
- Legal and Institutional Framework
- Project Description
- Baseline Data: it is anticipated that no actual baseline data would be collected in the timeframe of the feasibility study. A site walk over is required to record observations to support the available literature environmental and social baseline data
- Environmental and Social Risks and Impacts
- Mitigation Measures
- Analysis of Alternatives that are included in the feasibility study
- Proposed Design Measures detailed at the level of feasibility study
- Environmental and Social Management Plan to include mitigation and monitoring activities.

5.2. Marmara Ereğlisi LNG Terminal

- The terminal for which this project will be implemented is located in Türkiye's province of Tekirdağ and Marmara Ereğlisi district. The distance (kilometer) of the facility to the main road is 500 m. The facility has no distance (kilometers) or rail connection to the railway. The name of the nearest airport is Çorlu Airport and its distance (kilometers) from the facility is 16 km.
- The EIA Positive decision of Ministry of Environment and Urbanism for the facility was taken on 8.8.2003.
- Within the scope of "LNG Terminal Facilities Dolphin Capacity Increase", there is an EIA positive decision of Ministry of Environment and Urbanism dated 28.06.2012.
- The facility has the necessary permits within the scope of the "Receiving Waste from Ships and Control of Wastes Regulation".
- In 2008, LNG Terminal was awarded the TS EN ISO 14001 Environmental Management System certificate.
- The Greenhouse Gas Emission Verification Report -2019 and Emission Measurement Summary Report-2019 are available of the facility.
- The facility has been awarded the "Zero Waste Certificate" by the MEUCC as it has established the relevant system within the scope of zero waste management (04.06.2020).

6. DELIVERABLES

6.1. Reporting requirements

The Consultant will submit the following reports in English and Turkish in one original and four copies:

Inception Report to be produced after one month from the start of implementation. In the report the Consultant shall describe e.g. initial findings, progress in collecting data, any difficulties encountered or expected in addition to the work programme and staff travel. The Consultant should

proceed with his/her work unless the Contracting Authority sends comments on the inception report.

Feasibility and Recommendations Report for Flare Gas Recovery System (Task-1 Section 4.1) to be produced within 60 calendar days following the approval of the Inception Report. In the report Consultant shall evaluate the integration of a potential Flare Gas Recovery System by preparing a techno-economic feasibility study considering process safety. Needs Assessment, Financial Analysis, Fiscal Risk Assessment, Risk Assessment (Non-financial) and E&S assessment parallel to World Bank Environmental and Social Framework shall be included in the feasibility report as well.

Financial Feasibility Training Report (Task-1 Section 4.1) to be produced within 15 calendar days following the completion of the Financial Feasibility Training. The Report shall indicate topics delivered, number of participants, results achieved etc.

Engineering Works and Detail Engineering of FGR System (Task-2 Section 4.2a) to be produced within 60 calendar days following the approval of the Task-1 Reports.

Market Research and Technical Specifications Reports (Task-2 Section 4.2a) to be produced within 45 calendar days following the approval of the Engineering Works and Detail Engineering Report.

Recommendation Report for the Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal (Task-2b Section 4.2) to be produced within 50 calendar days following the approval of the Feasibility and Recommendations Reports.

Detailed Report for the selected Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal (Task-2b Section 4.2) (Task-2b Section 4.2) to be produced within 55 calendar days following the approval of the approval of the Recommendations Report. **Interim Progress Reports** to be delivered quarterly describing progress of the work, difficulties encountered, observed factors influencing the assumptions, and documentation that specific results and objectives have been reached.

Draft final report shall be submitted no later than one month before the end of the period of implementation of tasks.

Final report shall incorporate any comments received from the parties on the draft report. The deadline for sending the final report is 10 days after receipt of comments on the draft final report. The report shall contain a sufficiently detailed description of the different options to support an informed decision on FGR System implementation. The detailed analyses underpinning the recommendations will be presented in annexes to the main report. The final report must be provided along with the corresponding invoice.

6.2. Submission and approval of reports

The reports referred above must be submitted to the MENR DGFR. All versions of all materials produced within the scope of all activities listed above and detailed in Section 4 must be delivered in the format requested by the MENR. All other designs, texts and draft versions of the outputs

will be submitted to the approval of BOTAS, World Bank and Delegation of the European Union to Turkey. All reports mentioned in section 6.1 above will be approved by BOTAS, World Bank and Delegation of the European Union to Turkey. No output or deliverables will be published without the approval of them.

All the reports and manuals under the project will be submitted in both Turkish and English languages, soft copies of the reports will be submitted in editable and ready to publish version (i.e. MS Word) and finalized reports will be published five hard copies in both Turkish and English. The Turkish version of the reports should be prepared after the approval of English version.

Reports shall be submitted to BOTAS, MENR DGFR, WB and the EUD via an e-mail first at the end of each reporting period specified above. The comments and/or revision requests on the reports will be submitted to the Consultant via e-mail within 15 calendar days after the receipt of them. The Consultant shall revise the report based on the comments and re-submit it within 10 calendar days via e-mail. If no comments are sent within 10 calendar days by the Beneficiary, WB and EUD, the final version can be processed as hard copy. In case of further comments and/or revision requests, the same cycle as outlined above will be done; however, for the purpose of timely finalization of the report, the parties may agree on different time limits. Once the final version is agreed by all parties, the Consultant will prepare and submit the hard copy of the reports/documents as the final version within 10 calendar days for approval.

The translations will be proofread by a native speaker to both languages before submitting.

7. MANAGEMENT AND COORDINATION

The consultant is responsible for the production of any design and content required within the scope of the project and should be able to carry out these works without the contribution and assistance of BOTAS. In addition, BOTAS and related institutions can use data, information, project output, etc. to be used to create public awareness. In any case, the Consultant is expected to carry out an effective exchange of ideas with all stakeholders. In this context, BOTAS, the relevant institutions / units of the Ministry, especially the MENR DGFR and the World Bank should be contacted. All kinds of content produced within the scope of the project will be approved by BOTAS, World Bank and Delegation of the European Union to Turkey.

The MENR DGFR (PIU) is the Contracting Authority of the project. The Contracting Authority will be responsible for tendering, contracting, administration, overall project supervision, review and final approval of the reports, financial management including payments of project activities. MENR will assign one of the Directorate General of Foreign Relations (DGFR/PIU) staff as the Project Manager on behalf of MENR.

The End Beneficiary of the project is BOTAS. The End Beneficiary is responsible for the overall technical implementation of the project.

The consultant is responsible for conducting the exchange, coordination and approval processes described above. In this context, the Consultant is expected to appoint a Team Leader who will be in direct contact with MENR, including coordination and approval.

MENR and/or BOTAS may request a meeting with the Consultant to go over the draft outputs or talk about the event programs within the scope of the project. The consultant should ensure that relevant experts attend these meetings.

For the purposes of this contract a Steering Committee will be established to meet for discussing the progress of the project, verify the achievement of the outputs and mandatory results and discuss actions to be undertaken for the successful implementation of the project. Steering Committee will be chaired by the representative of BOTAS. It will consist of representatives from BOTAS, MENR DGFR and the WB as members. Representatives of Directorate for EU Affairs and EU Delegation will also attend to the Steering Committee meetings as observers. BOTAS, when necessary, may invite other relevant participants to the Steering Committee meetings. The meetings will be convened on a quarterly basis and also on ad hoc basis when deemed necessary by its members. The consultant is obliged to attend the relevant experts to the meetings and to provide information about the project in the meeting. The responsibility for the organization of the Steering Committee meetings including preparation of minutes lies with the Consultant. The Steering Committee meetings shall be organized in Ankara at the premises of MENR or BOTAŞ in-person, virtually or hybrid.

8. QUALIFICATION REQUIREMENTS

The consultant will be selected in accordance with the guidance titled “The World Bank Procurement Regulations for IPF Borrowers – November 2020 (“Procurement Regulations”)” using the CQS (Consultants Qualification Selection) method. The consultant must have a company or joint venture that meets the qualification criteria listed below:

The selected Consultant will be a qualified firm or Joint Venture of firms that have demonstrated significant experience on Flare Gas Recovery System or green transition on Petroleum and Natural Gas sector, especially LNG facilities. The firm will propose a team capable of carrying out all aspects of the TOR.

9. TEAM COMPOSITION

Key Experts

Team Leader:

Bachelor's Degree in Engineering, preferably Mechanical Engineering

Minimum 10 years of experience in the field of Design of Oil and Gas Facilities

Completed at least project as Team Leader for Green Transition on LNG Terminals in the last 5 years

Experienced in project management and public relations in energy sector

Holding an Energy Manager Certificate, especially the TS EN ISO 50001 Energy Management System Certificate, is a preference.

Instrument Expert:

Bachelor's Degree in Engineering, preferably Electrical and Electronics engineering

Completed at least one project having similar nature in the last 5 years

Minimum 5 years of experience in the field of Oil&Gas, Petrochemicals, refinery

Process Expert:

Bachelor's Degree in Engineering, preferably Mechanical/Chemical engineering

Completed at least one project having similar nature in the last 5 years

Minimum 7 years of experience in the field of Oil&Gas or Petrochemicals or refinery

Mechanical Expert:

Bachelor's Degree in Engineering, preferably Mechanical engineering

Completed at least one project having similar nature in the last 5 years

Minimum 5 years of experienced in the field of Oil&Gas, Petrochemicals, refinery

Environmental Specialist:

Bachelor's Degree in Enviromental engineering

Assigning at least one project for reference

Minimum 3years of experienced in the field of Environmental Impact Assesment

Social Specialist:

Bachelor's Degree in Social Sciences

Assigning at least one project for reference

Minimum 3 years of experienced in the field of Social Sciences and Social Impact Assesment

Other experts, support staff & backstopping

CVs for experts other than the key experts should not be submitted in the tender but the tenderer will have to demonstrate in their offer that they have access to experts with the required profiles. The Consultant shall select and hire other experts as required according to the needs. The selection procedures used by the Consultant to select these other experts shall be transparent, and shall be based on pre-defined criteria, including professional qualifications, language skills and work experience.

The costs for backstopping and support staff, as needed, are considered to be included in the tenderer's financial offer.

Facilities to be provided by the Consultant

The Consultant shall ensure that experts are adequately supported and equipped. In particular it must ensure that there is sufficient administrative, secretarial and interpreting provision to enable experts to concentrate on their primary responsibilities. It must also transfer funds as necessary to support their work under the contract and to ensure that its employees are paid regularly and in a timely fashion.

The Consultant shall be responsible for all administrative costs of employing the relevant experts, such as relocation and repatriation expenses (incl. flights to and from Türkiye upon mobilization and demobilization), accommodation, expatriation allowances, leave, medical insurance and other employment benefits accorded to the experts by the Consultant.

The Consultant will be responsible for provision of the services detailed under “4. Scope of Work” also including the following:

- Eventual communication (international phone calls), interpretation during the conduct of the expert’s assignment and local transportation within the city,
- Office equipment such as computer, printer, photocopying machine, projector, camera, voice recorder, communication equipment (telephone, fax, modem) as well as office running costs such as international calls, secretarial services, supplies and consumables, spares and repairs, copying and printing,
- All required patented/licensed software,
- At least two coffee breaks and lunch with refreshments for workshop with 40 participants (Task-3)
- All organizational expenses; full-board accommodation of participants from outside the event location, costs of meal and beverages and costs of travel of the participants (including inter and intra-city travels),
- Cost of technical visit including travel (national and international including inter and intra city travels), accommodation (in at least 4-star hotel or equivalent) and meals and beverages of the 12 participants as well as fees of the institution to be visited, visa costs,

- Other expenditures such as, preparation of visibility materials, translation, interpretation, presentation facilities, preparation and printing of training materials and other materials including reports produced in both English and Turkish languages.

It is the Consultant’s responsibility to ensure proper communication (English/Turkish) with interlocutors and language barriers should be addressed by the Consultant during implementation.

Actual costs paid for travel and accommodation could be covered under the project budget.

However, no pocket money shall be paid to civil servants in any case.

10. DURATION OF THE SERVICES

The total duration of consulting services will be 14 months.

Activity	Duration
Inception Report	1 st month
Financial Feasibility Training	Within 2 days following the completion of the Inception Phase.
Feasibility and Recommendations Report for Flare Gas Recovery System (Task-1 Section 4.1)	Within 60 calendar days following the approval of the Inception Report.
Financial Feasibility Training Report (Task-1 Section 4.1)	Within 15 calendar days following the completion of the Financial Feasibility Training.
Engineering Works and Detail Engineering Report of FGR System (Task-2a Section 4.2.)	Within 60 calendar days following the approval of the Task 1 Reports.
Market Research and Technical Specifications Reports (Task-2a Section 4.2)	Within 45 calendar days following the approval of the Engineering Works and Detail Engineering Report.
Recommendation Report for the Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal (Task-2b Section 4.2)	Within 50 calendar days following the approval of the Task 1 Reports
Detailed Report for the selected Efficiency Technologies applicable to Marmara Ereğlisi LNG Terminal (Task-2b Section 4.2)	Within 55 calendar days following the approval of the Recommendations Report

Technical Visit (Task-3 Section 4.3)	4 days including travel days throughout the contract period.
Workshop (Task-3 Section 4.3)	1 day throughout the contract period.
Interim Progress Reports (including presentation to the SC)	Every 3 months
Draft Final Report	Within 30 calendar days following the approval of the last report under Task 2
Final Report	Within 10 calendar days following the approval of the Draft Final Report

11. PUBLICITY AND VISIBILITY

The Consultant shall take all necessary measures to publicize the fact that the European Union has financed the Program.

In addition, the Consultant shall take the necessary measures to ensure the visibility of the European Union financing or co financing. These measures must comply with the rules laid down and published by the Commission on the visibility of external operations: https://ec.europa.eu/europeaid/communication-and-visibility-manual-eu-external-actions_en

All projects/contracts implemented under this program shall comply with the **Visibility Guidelines for European Commission Projects in Türkiye** published by the EU Delegation to Türkiye, at:

<http://www.avrupa.info.tr/en/learn-about-eu-visibility-guidelines-16>

All communication and visibility activities should be carried out in close co-operation with the WB. The WB is the main authority in charge of reviewing and approving visibility-related materials and activities. Before initiating any information, communication or visibility material and activity, Consultant and implementing partners should seek the approval of the WB in writing.

The EU-Türkiye cooperation logo should be accompanied by the following text:

“This project is co-financed by the European Union and the Republic of Türkiye.”

Whether used in the form of the EU-Türkiye cooperation logo for information materials or separately at events, the EU and Turkish flag have to enjoy at least double prominence each, both in terms of size and placement in relation to other displayed logos and should appear on all materials and at all events as per the Communication and Visibility Manual for European Union External Actions. At visibility events, the Turkish and the EU flag have to be displayed prominently and separately from any logos.

Logos of the End Beneficiary (BOTAŞ) institution and the WB should be clearly separated from the EU-Türkiye partnership logo and be maximum half the size of each flag. The logos will not be accompanied by any text. The WB and End Beneficiary logo will be on the lower left-hand corner and lower right-hand corner respectively. The Consultant logo with the same size will be in the middle of the WB and End Beneficiary logo. If the Consultant is a consortium, only the logo of the consortium leader will be displayed.

Any publication by the Consultant, in whatever form and by whatever medium, including the Internet, shall carry the following or a similar warning: *“This document has been produced with the financial assistance of the European Union”*. In addition, the back cover of any such publications by the Consultant should also contain the following disclaimer: *“The contents of this publication are the sole responsibility of name of the author/Consultant/– and can in no way be taken to reflect the views of the European Union, World Bank Group and MENR”*.

ANNEX-I

FLARE GAS RECOVERY SYSTEM

The Flare (Stack) provides safe burning of gases which cannot be managed in the process at the terminal. The safety burned Flare Gas mainly comes from:

- The LNG storage tanks
- Pressure Relieve Valves (PSV) of other equipment
- The equipment which are shut down during maintenance (cleaning gases in this case)

As can be seen from the Process Flow Diagram in Figure-1, FGRS system can be installed between the 105 F KO Drum and 101 B Flare Stack by using the 32" line.

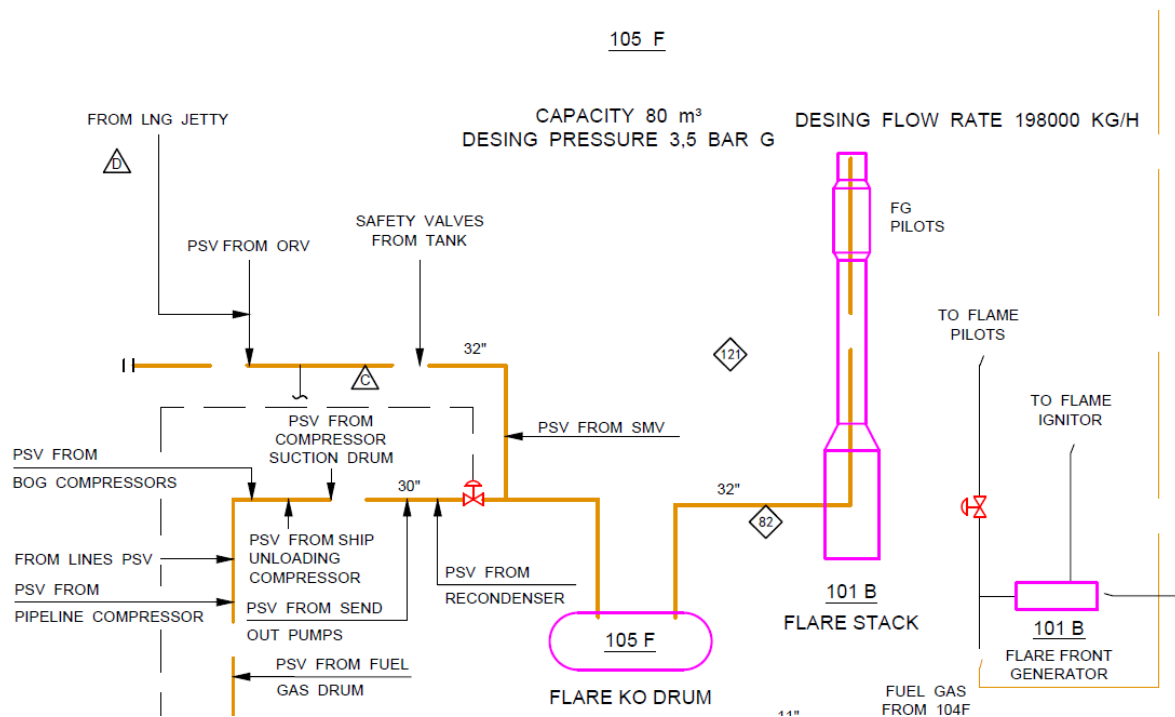


FIGURE-1 Flare Stack Flow Diagram

As shown in Figure-2, a FGRS system generally consists of drum, compressor, piping and instruments. Firstly, for removing water, oil and other undesirable substance, the recovered gas is taken in the drum. After that, the gas is pressurized with a compressor to reach desired pressure level and it is sent to end user for fuel gas usage or other purposes.

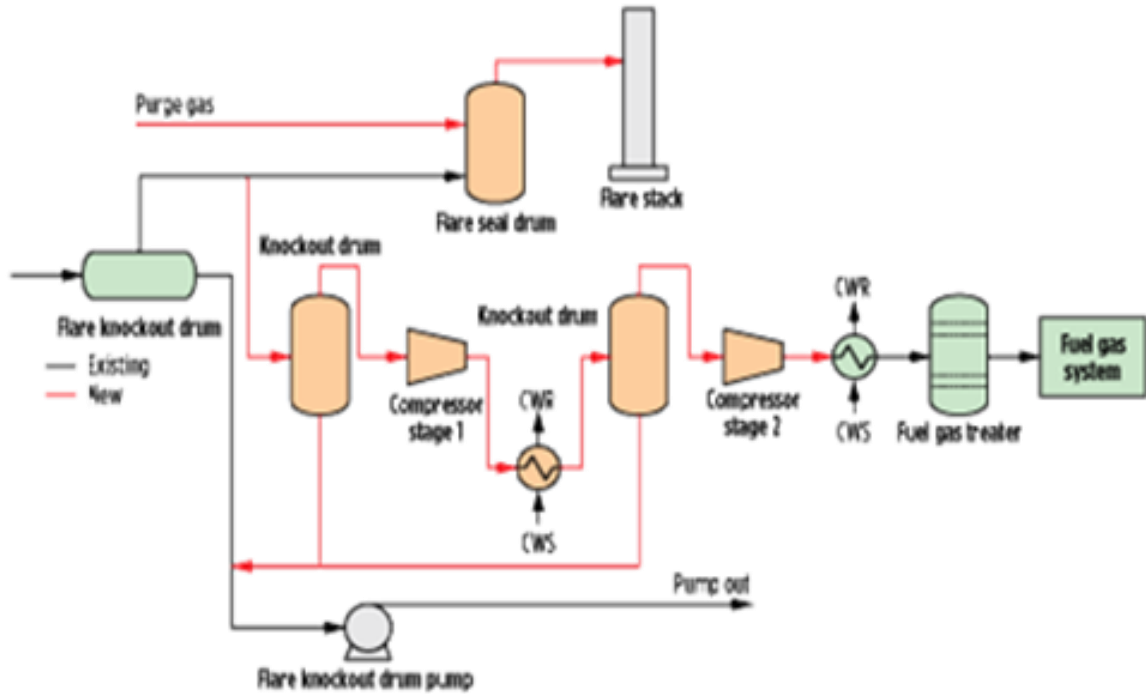


FIGURE-2 Typical Flare Gas Recovery System

Abovementioned FGRS system is a foreseen one and implementation of FGRS in BOTAŞ LNG Terminal requires detailed analysis and engineering by experts in their field. However, it can be seen that installation of FGRS will only affect the Flare Stack and Flare Stack related systems and it will not directly affect the main operations in the facility.

FACILITIES NEAR BOTAŞ LNG TERMINAL

Marmara Warehousing Services, Marmara Ereğlisi Petroleum Station and Trakya Electricity Generation Facility are the neighbors of BOTAŞ Marmara Ereğlisi LNG Terminal. The display of the surroundings of BOTAŞ LNG Terminal over satellite image is given in Figure-3.

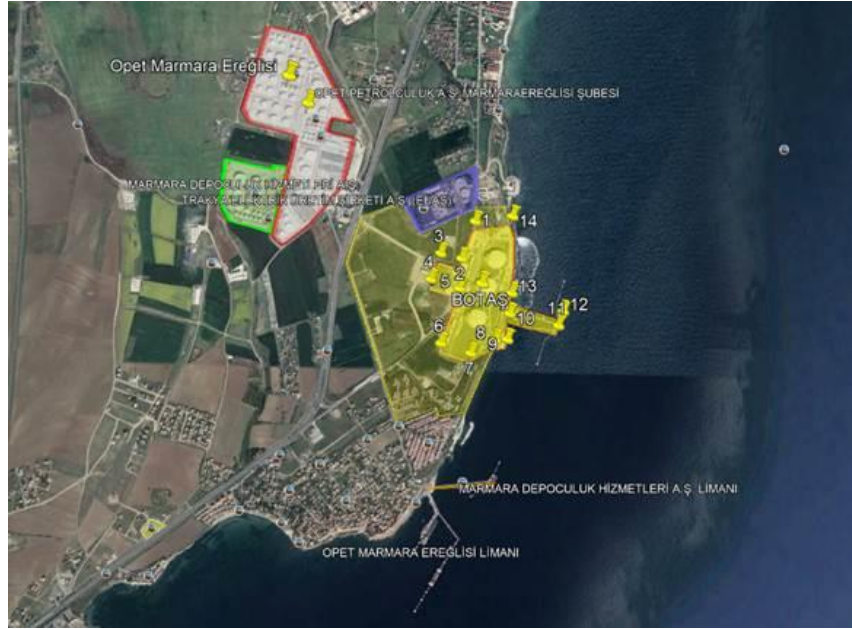


FIGURE-3 Facilities around BOTAS LNG Terminal

Trakya Electricity Generation Facility is the border neighbor of BOTAS LNG Terminal. Detailed information on the Facility is given in Table-1.

TABLE-1 Information on Trakya Electricity Generation and Cogeneration Facility

TRAKYA ELECTRICITY COGENERATION	Information on the Facility	Trakya Electricity Generation and Cogeneration Facility is handed over to Public Sector and it is inactive at current state.
	Distance to the Facility	1 km
	Hazards that may arise from the Facility	Fire, Explosion
	Restrictions that may be caused by this Facility during an emergency response	There is no restriction that may arise from the Facility.
	Common Security Protocols with This Facility	Security Protocol Water Usage Protocol