











# 1.5 Million Natural Gas Connections Project in 11 Governorates

## Site-Specific Environmental and Social Impact Assessment

## Executive Summary
## El Khosous /Qalubia Governorate

**September 2016**

**EGAS**
**Egyptian Natural Gas Holding Company**

**Developed by**

**EcoConServ Environmental Solutions**

**Petrosafe**
**Petroleum Safety & Environmental Services Company**

# EXECUTIVE SUMMARY

## 1 Introduction

The Government of Egypt (GoE) has immediate priorities to increase household use of natural gas (NG) by connecting 1.2 million households/yr to the gas distribution network to replace the highly subsidized, largely imported Liquefied Petroleum Gas (LPG).

The GoE is implementing an expansion program for Domestic Natural Gas connections to an additional 1.5 Million households over the next 4 years. The project presented in this study is part of a program that involves extending the network and accompanying infrastructure to connect 1.5 million Households in 11 Governorates between 2016 and 2019 with the assistance of a World Bank Loan of up to US$500 Million and the Agence Française de Développement (French Agency for Development) financing of up to €70 Million. The program is estimated to cost US$850 Million.

**The ESIA objectives are as follows:**

- Describing project components and activities of relevance to the environmental and social impacts assessments
- Identifying and addressing relevant national and international legal requirements and guidelines
- Describing baseline environmental and social conditions
- Presenting project alternatives and no project alternative
- Assessing potential site-specific environmental and social impacts of the project
- Developing environmental & social management and monitoring plans in compliance with the relevant environmental laws
- Documenting and addressing environmental and social concerns raised by stakeholders and the Public in consultation events and activities

As the project involves components in various areas within the 11 governorates, the parties to the project agreed that Site-Specific Environmental and Social Impact Assessments (SSESIAs) for each of the project sub-areas within the governorate will be prepared. Guided by the 2013 Environmental and Social Impact Assessments Framework (ESIAF) and Supplementary Social Impact Assessment Framework (SSIAF), this is the site specific ESIA for the connections network planned for the El Khosous city in Qalubia Governorate. The project in El Khosous encompasses expansion of an existing PRS up to 20,000 $m^3/h$, as well as 80,000 households which will be connected over 3 years as follows: 3,000 in year 1, 27,000 in year 2, and 50,000 in year 3.

**The local distribution company responsible for project implementation in El Khosous is Egypt Gas (شركة غاز مصر).**

# 2 Project Description

## 2.1 Background

Natural Gas is processed and injected into the high pressure lines of the national Grid (70 Bar) for transmission. Upon branching from the main lines to regional distribution networks, the pressure of the NG is lowered to 7 Bar at the Pressure Reduction Stations (PRS). An odorant is added to the NG at PRSs feeding distribution networks to residential areas[1] in order to facilitate detection. Regulators are then used to further lower the pressure to 100 mbar in the local networks, before finally lowering the pressure to 20 mbar for domestic use within the households. In addition to excavation and pipe laying, key activities of the construction phase also include installation of pipes on buildings, internal connections in households, and conversion of appliance nozzles to accommodate the switch from LPG to NG.

## 2.2 Project Work Packages

### 2.2.1 Main feeding line/network "7 bar system – PE 100"

A gas distribution piping system that operates at a pressure higher than the standard service pressure delivered to the customer. In such a system, a service regulator is required to control the pressure delivered to the customer.

Main feeding lines are mainly constructed from polyethylene pipes (HDPE) with maximum operating pressure (MOP) below 7 bar.

### 2.2.2 Distributions network "Regulators, PE80 Networks"

A gas distribution piping system in which the gas pressure in the mains and service lines is substantially the same as that delivered to the customer's Meters. In such a system, a service regulator is not required on the individual service lines.

Distribution networks are mainly constructed from polyethylene pipes (MDPE) with MOP below 100 millibar.

### 2.2.3 Installations (Steel Pipes)

A gas distribution piping system consist of steel pipes which is connected from individual service line to vertical service pipe in a multistory dwelling which may have laterals connected at appropriate floor levels; in addition to service pipe connected to a riser and supplying gas to a meter and gas appliances on one floor of a building.

Internal Installation consists of a pipe connecting the pressure reducing regulator/district Governor and meter Outlet (MOP 25 millibar) to appliances inside the customer's premises.

### 2.2.4 Conversions

Conversions involve increasing the diameter of the nozzle of the burner of an appliance to work with natural gas as a fuel gas rather LPG or others.

[1] Because natural gas is odorless, odorants facilitate leak detection for inhabitants of residential areas.

# 3 Legislative and Regulatory Framework

## 3.1 Applicable Environmental and Social Legislation in Egypt

- Law 217/1980 for Natural Gas
- Law 4 for Year 1994 for the environmental protection , amended by Law 9/2009 and law 105 for the year 2015.Executive Regulation(ER) No 338 for Year 1995 and the amended regulation No 1741 for Year 2005, amended with ministerial decree No 1095/2011, ministerial decree No 710/2012, ministerial decree No 964/2015, and ministerial decree No 26/2016
- Law 38/1967 for General Cleanliness
- Law 93/1962 for Wastewater
- Law 117/1983 for Protection of Antiquities
- Traffic planning and diversions
  - Traffic Law 66/1973, amended by Law 121/2008 traffic planning
  - Law 140/1956 on the utilization and blockage of public roads
  - Law 84/1968 concerning public roads
- Work environment and operational health and safety
  - Articles 43 – 45 of Law 4/1994, air quality, noise, heat stress, and worker protection
  - Law 12/2003 on Labor and Workforce Safety
  - Book V on Occupational Safety and Health (OSH)
  - Minister of Labor Decree 48/1967.
  - Minister of Labor Decree 55/1983.
  - Minister of Industry Decree 91/1985
  - Minister of Labor Decree 116/1991.

## 3.2 World Bank Safeguard Policies

Three policies are triggered for the project as a whole: Environmental Assessment (OP/BP 4.01), Physical Cultural Resources (OP/BP 4.11), and Involuntary Resettlement (OP/BP 4.12). However, OP/BP 4.12 will not be applicable to **El Khosous** as no land acquisition or resettlement activities are anticipated. Particularly, as the network will pass through the main urban roads/streets and side roads without causing any damage to private assets or lands

In addition to the above mentioned safeguards policies, the Directive and Procedure on Access to Information[2] will be followed by the Project.

# 4 Analysis of Alternatives

## 4.1 No Project Alternative

This Natural Gas Connections to Households Project is expected to yield many economic and social benefits in terms of providing a more stable energy source, achieving savings in LPG consumption and enhancing safety in utilizing energy.

[2] https://policies.worldbank.org/sites/ppf3/PPFDocuments/Forms/DispPage.aspx?docid=3694

The No-Project alternative is not favored as it simply deprives the Egyptian Public and Government of the social, economic, and environmental advantages.

### 4.2 Energy Alternatives

- **Maintain LPG use:** Introduction of piped natural gas to replace LPG will help to remove subsidies and reduce imports. The proposed project would also improve the safety of gas utilization as appliance standards are strictly controlled and only qualified personnel carry out installations and respond to emergencies. In the case of LPG, installations are not carried out by trained personnel resulting in possible unsafe installations and unsafe use of LPG.

- **Convert to Electricity**: The second alternative is to convert all homes to use electricity for all energy supply applications. Additional power stations would be needed to cope with the additional demand created by utilization of electricity in homes, which most probably would operate also by natural gas. Power losses in transmission and distribution are also significantly higher than their natural gas equivalents which would add to the overall inefficiency.

- **Use Renewables**: the renewables market does not present feasible, practical, and affordable alternatives to connecting 1.5 million households at this point in time in Egypt. Biogas requires large amounts of agricultural and domestic waste, while solar panels and heaters remain in pilot phase.

| Energy alternatives do not provide favorable options to the proposed NG networking |
|---|

### 4.3 Installation costs

The average natural gas connection installation cost is about 5600 EGP and consumers contribute a part of 1700 LE because the connection is heavily subsidized by the Government. This payment can be made either upfront or in installments over a period of time. Installment schemes are available to all community people.

The government of Egypt is negotiating with the project's financing organizations in order to secure additional subsidy to poor and marginalized groups. They also provide facilitation payments strategies through offering various installment schemes. The following are the main types of installments: 138 EGP/Month for 12 months,74 EGP/Month for 24 months, 52 EGP/Month for 36 months, 42 EGP/Month for 48 months, 35 EGP/Month for 60 months, 31 EGP/Month for 72 months and 28 EGP/Month for 84 months

## 5 Environmental and Social Impacts and Mitigations

The environmental and social advantages of switching household fuel from LPG cylinders to natural gas pipelines are diverse. On the residential level, the proposed project will lead to improved safety, reduced physical/social/financial hardships, and secure home fuel supply. On the national level, it promotes the utilization of Egyptian natural resources and reduces the subsidy and import burden. Even on the global level, the project involves cleaner fuel with reduced carbon footprint.

A thorough analysis of environmental and social impacts is important to detail an effective

management and monitoring plan which will minimize negative impacts and maximize positives.

The assessment of impacts distinguishes between the construction phase and the operation phase.

## 5.1 Positive Impacts

### 5.1.1 During the construction phase

***Provide direct job opportunities to skilled and semi-skilled laborers***

- The project is expected to result in the creation of job opportunities, both directly and indirectly. Based on similar projects implemented recently by EGAS and the local distribution company, the daily average number of workers during the peak time will be about 200 workers.
- The total number of new short term job opportunities within the project area is estimated at 400-500 temporary jobs.
- In order to maximize employment opportunities in the local communities it is anticipated that training will be required for currently unskilled workers. On-the-job training will also supplement opportunities for the local workforce for both temporary construction roles and for long-term operation phase position, where these are available.

***Create indirect opportunities***

As part of the construction stage, a lot of indirect benefits are expected to be sensed in the targeted areas due to the need for more supporting services to the workers and contractors who will be working in the various locations. This could include, but will not be limited to accommodation, food supply, transport, trade, security, manufacturing… etc.

### 5.1.2 During the operation phase

- As indicated in the Baseline Chapter, women are the key players in the current domestic activities related to handling LPG cylinders and managing its shortage. Being the party affected most from the shortfalls of the use of LPG cylinders, the NG project is expected to be of special and of major benefits to women. This includes, but is not limited to, clean and continuous source of fuel that is safe and does not require any physical effort and is very reasonable in terms of consumption cost. Time saving is among the benefits to women. The use of a reliable source of energy will allow women to accomplish the domestic activities in less time and this will potentially open a space for better utilization of the saved time.
- Constantly available and reliable fuel for home use.
- Reduced expenditure on LPG importation and subsidies, as 80,000 households connection will be installed in the area. Each household consumes 1.5 LPG cylinders monthly. The 80,000 NG household connections will save 120 thousand LPG cylinders per month. The subsidy value is about 70 EGP per cylinder. Consequently, the total saved monthly subsidy will be about 8.4 million EGP monthly. That will result in total

annual savings of 100.8 million EGP. Additionally, significant savings will result due to replacing the electric water heater by NG heater.

- Significantly lower leakage and fire risk compared to LPG.
- Improved safety due to low pressure (20 mBar) compared to cylinders.
- Beneficiaries to benefit from good customer service and emergency response by qualified personnel/technicians.
- Eliminate the hardships that special groups like the physically challenged, women, and the elderly had to face in handling LPG.
- Limiting possible child labor in LPG cylinder distribution

## 5.2 Anticipated Negative Impacts

### 5.2.1 Impact Assessment Methodology

To assess the impacts of the project activities on environmental and social receptors, a semi-quantitative approach based on the Leopold Impact Assessment Methodology with the Buroz Relevant Integrated Criteria was adopted.

The table below presents the classification of impact ratings and respective importance of impact values.

| Importance of Impact | **Impact rating** | |
|---|---|---|
| **0 - 25** | **None** or irrelevant (no impact) | |
| **26 - 50** | **Minor** severity (minimal impact; restricted to the work site and immediate surroundings) | |
| **51 - 75** | **Medium** severity (larger scale impacts: local or regional; appropriate mitigation measures readily available) | |
| **76 - 300** | **Major** severity (Severe/long-term local/regional/global impacts; for negative impacts mitigation significant) | |

The following tables summarize the impacts and the corresponding mitigation measures within the management plan, in addition to the monitoring plans proposed for implementation.

## 5.3 Environmental and Social Management Matrix during CONSTRUCTION

**Table 1:Environmental and Social Management Matrix during CONSTRUCTION**

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| **Local traffic and accessibility** | **Traffic congestion** (and associated noise/air emissions) | Excavation during off-peak periods<br><br>Time limited excavation permits granted by local unit & traffic department | Excavation contractors | – LDC +<br>– Traffic department | Contractor has valid conditional permit + Field supervision | Contractor costs<br><br>LDC management costs |
| | | Announcements + Signage indicating location/duration of works prior to commencement of work | – LDC<br>– Excavation contractors | – LDC HSE<br>– Local Unit<br>– Traffic department | Ensure inclusion in contract + Field supervision | |
| | | Apply Horizontal Directional Drilling under critical intersections whenever possible to avoid heavy traffic delays | Contractor | LDC HSE | Field supervision | |
| | | Traffic detours and diversion | Traffic Department | Traffic Department | Field supervision for detouring efficiency Complaints received from traffic department | Additional budget not required |
| | | Road restructuring and closing of lanes | | | Fluidity of traffic flow | |
| **Ambient air quality** | **Increased emissions of dust and gaseous pollutants** | Controlled wetting and compaction of excavation/backfilling surrounding area | Excavation Contractor | LDC HSE | Contractual clauses + Field supervision | – Contractor costs<br>– LDC management costs |
| | | Isolation, covering, transportation in equipped vehicles and disposal of stockpiles | | | Contractual clauses + Field supervision | |
| | | Compliance to legal limits of air emissions from all relevant equipment | | | Measure and document emissions of machinery by regular audits request emission measurements | |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| | | – Availability of 24-7 hotline service (129) to all beneficiaries and the public for reporting possible leaks, damages or emergencies<br>– Quick response to gas leaks by evacuation of the affected area<br>– Repair or replacement of failed component | LDC | LDC HSE | Field Supervision | |
| – **Ambient noise levels**<br>– **Local community**<br>– **Workers** | **Increased noise levels beyond WB/National permissible levels** | Ear muffs, ear plugs, certified noise PPE for workers | – LDC<br>– Excavation Contractor | LDC HSE | Contractual clauses + Field supervision (audits) | – Contractor costs<br>– LDC management costs |
| | | Avoid noisy works at night whenever possible | | | Field supervision<br>Complaints receipt from local administration | |
| – **Ground utilities' integrity**<br>– **Local community** | **Damage to underground utilities resulting in water/wastewater leaks, telecommunication and electricity interruptions** | Coordination with departments of potable water, wastewater, electricity, and telecom authorities to obtain maps/ data on underground utilities, whenever available | Excavation Contractor | LDC HSE | Official coordination proceedings signed by representatives of utility authorities<br>– Examination of site-specific reports and records<br>– Field supervision | – Contractor management costs<br>– LDC management costs |
| | | If maps/data are unavailable:<br>Perform limited trial pits or boreholes to explore and identify underground utility lines using non-intrusive equipment | | LDC HSE<br>Supervisor | – Contractual clauses + Field supervision | |
| | | Preparation and analysis of accidental damage reports | | LDC HSE | – Review periodic HSE reports | |
| | | Repair and rehabilitation of damaged components | | LDC HSE<br>Local Government Unit<br>Local Police | – Contractual clauses + Field supervision | |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| – **Streets (physical status)**<br>– **local community and workers (health and safety)** | **Hazardous waste accumulation** | – Temporary storage in areas with impervious floor<br>– Safe handling using PPE and safety precautions<br>– Transfer to LDC depots for temporary storage<br>– Disposal at licensed Alexandria hazardous waste facilities (Nasreya or UNICO)<br>– Hand-over selected oils and lubricants and their containers to Petrotrade for recycling | – LDC<br>– Excavation Contractor | LDC HSE | Field supervision and review of certified waste handling, transportation, and disposal chain of custody | Indicative cost items included in contractor bid:<br>Chemical analysis of hazardous waste<br>Trucks from licensed handler<br>Pre-treatment (if needed)<br>Disposal cost at Nasreya<br><br>Approximate cost of the above (to be revised upon project execution): 8,000-10,000 LE per ton |
| | | – Adequate management of asbestos and any possible hazardous waste | Water Authority + contractor | | Field supervision + review of Water Authority manifests | – Contractor costs<br>– LDC |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| | | – Minimize fueling, lubricating and any activity onsite that would entail production of hazardous materials empty containers<br>– Pre-Plan the anticipated amounts of hazardous liquid materials (such as paint, oils, lubricants, fuel) to be used in the various activities in order to minimize leftovers and residuals.<br>– To the extent practical, seek to combine leftovers or residuals of the same liquid material/waste in order to minimize the number of containers containing hazardous residuals<br>– Ensure hazardous liquid material/waste containers are always sealed properly and secured from tipping/falling/damage/direct sunlight during transportation and storage<br>– In case of spillage:<br>o avoid inhalation and sources of ignition<br>o cover and mix with sufficient amounts of sand using PPE<br>o collect contaminated sand in clearly marked secure containers/bags<br>– Add sand to inventory of hazardous waste | – LDC<br>– Excavation Contractor | | Field supervision | management costs |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| – **Local community** | **Non-hazardous waste accumulation** | 1. Designate adequate areas on-site for temporary storage of backfill and non-hazardous waste<br>2. Segregate waste streams to the extent possible to facilitate re-use/recycling, if applicable<br>3. Reuse non-hazardous waste to the extent possible<br>4. Estimate size of fleet required to transport wastes.<br>**5. <u>Transfer waste to disposal facility East of the project area</u>** | – LDC<br>– Excavation Contractor | LDC HSE | – Contractual clauses<br>– Monitoring of waste management plan<br>– Field supervision | – Contractor costs<br>– LDC management costs |
| **Local community** | **Destruction of streets and pavement** | – Arrange Restoration and re-pavement (رد الشئ لأصله) with local unit<br>– Communication with local community on excavation and restoration schedules. | – LDC in cooperation with the LGU | EGAS | - Field supervision<br>- Coordination with LGU as needed | Included in re-pavement budget agreed by LDC with local units or Roads and Bridges Directorate |
| **Occupational health and safety** | **Health and safety** | 1. Full compliance to EGAS and LDC HSE requirements, manuals, and actions as per detailed manuals developed by Egypt Gas<br>2. Ensure the provision of the appropriate personal protective Equipment and other equipment needed to ensure compliance to HSE manuals | Excavation Contractor | LDC HSE and EGAS SDO | Field supervision | – Contractor costs<br>– LDC management costs |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost of mitigation / supervision |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| **Local communities and businesses** | **Lack of accessibility to businesses due to delay in street rehabilitation** | Compliance with the Environmental management plan concerning timely implementation of the construction schedule to minimize impact on local business<br>• Follow up the procedure of Grievance Redress Mechanism<br>• Ensure transparent information sharing | During digging process<br>LDC<br>The sub-contractors | LDC and EGAS SDO | – Ensure the implementation of GRM<br>– Supervision on Contractors performance | No cost |
| **Local community Health and safety** | **Threat to Safety of users and houses (due to limited level of awareness and misconceptions)** | Prepare Citizen engagement and stakeholder plan<br>Awareness raising campaigns should be tailored in cooperation with the community-based organizations | During the construction<br>LDC | LDC and EGAS SDO | – List of awareness activities applied<br>– Lists of participants<br>– Documentation with photos<br>– Awareness reports | – 2250 $ per awareness raising campaign<br>– 2250 $ for brochure and leaflets to be distributed (material available by EGAS-$ spent) |

## 5.4 Environmental and Social Monitoring Matrix during CONSTRUCTION

**Table 2: Environmental and Social Monitoring Matrix during CONSTRUCTION**

| Receptor | Impact | Monitoring indicators | Responsibility of monitoring | Frequency of monitoring | Location of monitoring | Methods of monitoring | Estimated Cost of monitoring |
|---|---|---|---|---|---|---|---|
| **Local traffic and accessibility** | Reduction of traffic flow and accessibility to local community | Comments and notifications from Traffic Department | LDC HSE | Monthly during construction. | Construction site | Documentation in HSE monthly reports<br>Complaints log | LDC management costs |

| Receptor | Impact | Monitoring indicators | Responsibility of monitoring | Frequency of monitoring | Location of monitoring | Methods of monitoring | Estimated Cost of monitoring |
|---|---|---|---|---|---|---|---|
| **Ambient air quality** | Increased air emissions | HC, CO% and opacity | LDC HSE | Once before construction + once every six months for each vehicle | Vehicles licensing Department | Measurements and reporting of exhaust emissions of construction activities machinery<br><br>Complaints log | LDC management costs |
| **Ambient noise levels** | Increased noise levels | Noise intensity, exposure durations and noise impacts | LDC HSE | Regularly during site inspections and once during the night in every residential area or near sensitive receptors such as hospitals | Construction site | Measurements of noise levels Complaints log | LDC management costs |
| | | Complaints from residents | LDC HSE | Monthly during construction. | Construction site | Documentation in HSE monthly reports | LDC management costs |
| **Underground utilities** | Damages to underground utilities and infrastructure | Official coordination reports with relevant authorities Accidents documentation | LDC HSE | Monthly during construction. | Construction site | Documentation in HSE monthly reports | LDC management costs |
| **Physical state of street** | Waste generation | Observation of accumulated waste piles | LDC HSE | During construction. Monthly reports | Construction site | Observation and documentation | LDC management costs |
| | | Observation of water accumulations resulting from dewatering (if encountered) | LDC HSE | During construction. Monthly reports | Around construction site | Observation and documentation | LDC management costs |
| | | Chain-of-custody and implementation of waste management plans | LDC HSE | Zonal reports | Construction site and document examination | Site inspection and document inspection | LDC management costs |

| Receptor | Impact | Monitoring indicators | Responsibility of monitoring | Frequency of monitoring | Location of monitoring | Methods of monitoring | Estimated Cost of monitoring |
|---|---|---|---|---|---|---|---|
| **Local community** | Damaging to the streets | – Streets quality after finishing digging<br>– Number of complaints due to street damage | LDC, EGAS | Four times per year, each three months | Site and Desk work | Checklists and complaints log | No cost |
| **Local community** | Threat to Safety of users and houses (due to limited level of awareness and misconceptions) | – Number of awareness raising implemented<br>– Number of participants in information dissemination | LDC, EGAS | Quarterly monitoring | Office | Reports<br>Photos<br>Lists of participants | No cost |

## 5.5 Environmental and Social Management Matrix during OPERATION

**Table 3: Environmental and Social Management Matrix during OPERATION**

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| - **Ambient air quality**<br>- **Community health and safety** | **Network integrity** | – Detailed review of the geotechnical and geological history of the project area<br>– Development of a full emergency response plan<br>– Random inspections and awareness campaigns to ensure that NG piping and components (both inside the household and outside) are not be altered, violated, or intruded upon in any way without written approval from, or implementation of the alteration by, the LDC.<br>– Availability of 24-7 hotline service (129) to all beneficiaries and the public for reporting possible leaks, damages or emergencies<br>– Quick response to gas leaks by evacuation of the affected area<br>– Repair or replacement of failed component | LDC | LDC HSE. | - Map and local geotechnical report review<br>- Site inspections<br>- Awareness actions<br>- Periodical trainings and drills | LDC management costs |
| - **Ambient air quality**<br>- **Community health and safety** | **Repairs and maintenance (network and households)** | As with construction phase activities | – LDC<br>– Excavation Contractor | LDC HSE | As relevant from construction phase | LDC management costs |

| Receptor | Impact | Mitigation measures | Responsibility | | Means of supervision | Estimated Cost |
|---|---|---|---|---|---|---|
| | | | Mitigation | Supervision | | |
| **Economically disadvantaged Community members** | **Financial burden on economically disadvantaged due to the installments** | – Petro Trade should collect the installment immediately after the installation of NG<br>– The installments should be collected on monthly basis in order not to add burden to the poor, as it will be easier for them to pay on monthly basis<br>– The installment should not be high | Petro trade (Company responsible for collecting the consumption fees and the installments | EGAS | Banks loans log<br>Complaints raised by poor people due to the frequency of collecting the installments | No cost |
| **Informal LPG distributors** | **Loss of revenue for LPG distributors** | – LPG distributors should be informed about the NG potential areas in order to enable them to find alternative areas<br>– They should be informed about the GRM in order to enable them to voice any hardship | Butagasco | EGAS | Information sharing activities with the LPG vendors<br>Grievances received from them | No cost |
| **Community health and safety** | **Possibility of Gas leakage** | – Information should be provided to people in order to be fully aware about safety procedures<br>– The hotline should be operating appropriately<br>– People should be informed of the Emergency Numbers | LDC | LDC | Complaints raised due to Gas leakage | No cost |

## 5.6 Environmental and Social Monitoring Matrix during OPERATION

**Table 4: Environmental and Social Monitoring Matrix during OPERATION**

| Impact | Monitoring indicators | Responsibility of monitoring | Monitoring Frequency | Location of monitoring | Methods of monitoring | Monitoring Estimated Cost |
|---|---|---|---|---|---|---|
| **Network integrity** | - Earthquakes or geotechnical settlements<br>- Emergency response time and corrective actions during emergency drills<br>- Reports of alteration or tampering with ANY gas components | LDC HSE | Bi-annual inspections and annual emergency response drills | Along the network and inside and outside households | - Inspection, leakage detection, running the drills | LDC management costs |
| **Financial burden on economically disadvantaged due to the installments** | - Number of economically disadvantaged people who complained<br>- Number of those who can't pay the installment | LDC and Petro Trade, EGAS | Quarterly | Desk work | - Complaints log<br>- Bank reports<br>- Petro trade reports | No cost |
| **Impact on the informal LPG distributors** | - Grievance received from the informal LPG distributors<br>- Information shared with them | EGAS, LDC | Quarterly | Desk work | - Complaints log | No cost |
| **Possibility of Gas leakage** | - Complaints raised by the community people<br>- Number of leakage accidents reported/raised | LDC, EGAS | Four times per year, each three months | Site and Desk work | Complaints log LDC | No cost |

# 6 Stakeholder Engagement and Public Consultation

The public consultation chapter aims to highlight the key consultation and community engagement activities that took place as part of the preparation of the ESIAs and their outcomes. Following are the main groups consulted during the ESIAF and the SSESIA and the engagement tools used.

**Table 5: Summary of Consultation Activities in Qalubia Governorate**

| participants | Number | | Methods | Date |
|---|---|---|---|---|
| During the preparation of framework | | | | |
| | **Males** | **Females** | | |
| Potential beneficiaries and government officials | 6 | 8 | FGD | October-November 2013 |
| Governmental and NGOs | 3 | 2 | In-depth | Nov-13 |
| Community people | 69 | 206 | Structured questionnaire | October-November 2013 |
| Potential beneficiaries, government officials, NGO representatives | 63 | 8 | Public consultation | 21st of December 2013 |
| Total | 141 | 224 | | |
| **During the site specific study** | | | | |
| Potential beneficiaries and government officials | 80 | 78 | FGD | September and October 2015 |
| Governmental and NGOs | 12 | 4 | In-depth | |
| Community people | 477 | 727 | Structured questionnaire | |
| Potential beneficiaries, government officials, NGO representatives, | 64 | 19 | Public consultation | 10h of February 2016 |

## 6.1 Main results of consultation during the data collection phase

The majority of sample surveyed expressed their willingness to be connected to the NG regardless of the amount of money they can afford to pay. This trend is attributed to the fluctuation of the LPG prices.

Following are the main issues raised during data collection and scoping phase

**Table 6: Key comments and concerns raised during the Final Public Consultations**

| Subject | Questions and comments | Responses |
|---|---|---|
| **Installation action plan** | What the exact installation action plan? | There is a clear action plan that was developed by EGAS and Egypt Gas |

| Subject | Questions and comments | Responses |
|---|---|---|
| **Areas that have not been connected to the NG** | There are many areas that were not selected for NG connections. Will they be left behind? (This question was raised by all participants | There are certain specifications to install the NG to any area. In case the area is suitable, the Government of Egypt tries to allocate financial resources to install the NG. Given the limited resources, the installation plan to new areas might take some time |
| **Narrow streets problems** | Many areas in Qalubia Governorate have narrow streets. Will they be able to be connected to the NG? | According to the technical specification, certain street width is required in order to be able to mitigate any emergency cases |
| **Coordination with the Local Units** | It is highly recommended to coordinate with information centers within the local units in order to get information about the underground utilities. | All LDCs coordinate with the Local Units, not only to obtain information but also to be able to get permissions for street closures and crossings. |
| **The necessity to have sanitary system installed prior to NG** | Why it is so essential to have sanitary system installed prior to the NG installation? | Presence of Sewage/sanitation infrastructure prior to installing NG infrastructure is crucial. For safety reasons, NG should be the final ground utility installed in any area. |
| **Street restoration** | After the completion of the NG construction, the contractor never have streets rehabilitated | The LDCs disburse the cost of street restoration to the local unit and road authority prior to construction phase. The rehabilitation plan is then implemented by the local unit as part of their pavement plan. |
| **Regulator related problems** | There are regulators installed on the walls of buildings. In case of paving roads, such regulators might be covered. | Such concern is not viable due to the coordination between the LDCs and other entities. In case of implementing any projects after the installation of NG, all entities should inform the LDCs. They aim at securing the project. In case if any community member noticed such practices it will be essential to inform the LDCs on 129 telephone |

| Subject | Questions and comments | Responses |
|---|---|---|
| **Role of the NGOs** | What is the role of the NGOs? | They may play an active role in the process of information sharing regarding:<br>1- The cost of NG connection during the project and during operation<br>2- The importance to install the gas during the project as subsidy will be available only during the construction phase<br>3- The safety measures<br>4- Emergency procedures<br>5- Hotlines |

## 6.2 Summary of consultation outcomes

The majority of consulted groups expressed their willingness to install the NG to their areas. Aside from the overwhelming acceptance, few concerns were raised during the consultation process. Traffic congestion and street rehabilitation were the main concerns raised in El Khosous. NG Safety measures were raised as a main concern. Sharing of information in full cooperation with the community stakeholders and NGOs was strongly recommended by most of the consulted groups.

Site specific consultation efforts included all concerned stakeholders – be they persons/households affected by the project activities, civil society organizations representing the interest of the community, or regulatory and governmental bodies who will play a role in facilitating or regulating the implementation of site-specific project activities.

While WB safeguards and regulations state that a minimum of two large-scale, well-publicized public consultation sessions are a must for projects classified as category 'A' projects like the one at hand , additional consultation activities (for example through focus group discussions, in-depth meetings, and interviews) were implemented to reach the most vulnerable and difficult to reach community members. Additionally, in order to obtain larger scale and more quantifiable information, the consultant has conducted surveys in the different sites.