Terms of Reference: National Consultant - Energy Expert - Short term consultancy for the development of a Pilot Study to further assess the applicability of switching from conventional fuels to natural gas in the industrial sector in Lebanon, particularly in the industrial zones of Chekka and Zouk Mosbeh.

1. Background

During the last decade, the Ministry of Energy and Water (MoEW) has recognized the offshore hydrocarbon potential in Lebanon and has commissioned several studies to further analyze this potential.

On the technical side, and in preparation for launching the first offshore licensing round, the MoEW and the Lebanese Petroleum Administration (LPA) assigned geophysical service companies to perform seismic surveys that covered the entire Lebanese offshore. The results of these surveys showed that there are prominent oil and gas reserves, with gas being dominant.

On the environmental side, the Government of Lebanon (GoL) represented by the MoEW commissioned, in collaboration with the Ministry of Environment (MoE), the preparation of a Strategic Environmental Assessment (SEA) of the offshore petroleum sector. This assessment identified several environmental recommendations that created the foundations of the project entitled "Sustainable Oil and Gas Development in Lebanon" (SODEL) which includes two main components.

The SODEL project, in its second component, assessed during a previous Consultancy Service the uses of potential gas resources in different sectors in Lebanon, namely the transport and energy sectors, in order to develop upstream gas policy recommendations that would maximize economic benefits to Lebanon while safeguarding the environment. Particularly with respect to the Energy sector, this assessment was done through the preparation of a Cost-Benefit Analysis (CBA) for the use of Natural Gas and in the industrial, commercial, institutional and residential sectors in Lebanon. The purpose of that assessment was to ensure that all decisions taken in the upstream gas exploration and production sectors as well as in the downstream use of natural gas and other hydrocarbon fuels, if found, take environmental, economic and social considerations into account in order to protect both the environment and the local communities.

This document constitutes the Terms of Reference for the provision of consultancy services for the development of a Pilot Study to further assess the applicability of switching from conventional fuels to natural gas in the industrial sector in Lebanon, with special focus on the industrial zones of Chekka and Zouk Mosbeh. These industrial areas were selected due to the diversity of the industrial activity within them, and due to their presence on the coastal area of Lebanon, which when natural gas is available would be among the first areas to be supplied with natural gas.

SODEL is being implemented by the United Nations Development Programme UNDP (Energy and Environment Portfolio) in partnership with LPA and the MoEW.
2. Scope of Work, Responsibilities and Description of the Proposed Analytical Work

2.1 Scope of work

The aim of this work is to develop a pilot study that would showcase the costs and benefits of a switch from current fuel types to natural gas in different industries allocated in the coastal industrial zones of Chekka and Zouk Mosbeh (Annex 1 to this ToR). The pilot study would also provide an overview of the advantages and disadvantages of such a switch building on the results of the original CBA Study that was performed for the energy sector in Lebanon last year under the SODEL Project (attached CBA study).

More specifically, the role of this pilot study is to identify and analyze details of such a fuel switch considering the production processes of each of the selected industries and assess the associated impacts on environment, economics, and employment. In line with the above mentioned analysis, the potential for energy efficiency measures shall also be addressed.

2.2 Methodology of work

2.2.1 General Issues

The Methodology of work will consist of desk review, data analysis, meetings with stakeholders, as well as field visits to the identified industrial establishments.

The main challenges that will encounter the Consultant will be data gaps/discrepancies as well as and setting assumptions and extrapolations. All assumptions used have to be approved by the SODEL Project Committee.

2.3 Proposal

The Consultants shall present in their submitted proposal a full understanding of the results of the CBA for the use of natural gas in the energy sector in Lebanon and accordingly their methodology of implementation of the pilot study in relation therewith.

3. Expected Outputs and Deliverables

3.1 Outputs

The following sections detail the expected outputs from the Consultant for each required activity. They are intended as general guidelines only. The Consultant is expected to provide further input based on their own knowledge and experience.
Under the direct supervision of the SODEL Project Manager, the Consultant’s responsibilities are, but not limited to, the following:

**Task 1: Analysis of the industrial zones:**

- The Consultant shall identify the industries present in the Chekka and Zouk Mosbeh industrial clusters and prepare an overview on type, location, size, employment, and environmental status based on a rapid study of the area.

**Task 2: Analysis of production processes for the selected industries:**

- The consultant, in consultation with the selected industries, shall:
  - prepare an analysis of the production processes for the selected industries,
  - provide an analysis of the energy consumption practices and trends of the identified industries,
  - describe the typical production processes in Lebanon and compare them to international best practice,
  - identify the technical and financial aspects and implications required to shift the manufacturing process towards the use of natural gas as an alternative fuel source,
  - prepare an energy efficiency analysis for the target industries,
  - analyze energy flows within the production process, CAPEX, and potential economic savings when realizing the energy efficiency measures.

**Task 3: Preparation of a Cost Benefit Analysis for the target industries:**

- The consultant shall use the results of Task 2 to develop a CBA report for the use of natural gas in the selected industries.

- The consultant shall be granted access to the available CBA model that was developed for the MoEW during the consultancy service that prepared the CBA study for the use of natural gas in the energy sector in Lebanon last year as explained in section 1 above.

- The CBA shall also include a high-level environmental analysis for the identified industrial clusters, including the effects of the fuel switch to natural gas on local and global pollution such as noise, GHG emissions, traffic...

**3.2 Deliverables**

3.2.1 Deliverables
All deliverables should be handed out in 3 hard copies as well as one soft copy (word and PDF format). Copies of high resolution maps and graphics (if any) should also be handed out to the SODEL project management team.

The deliverables are to be submitted and reviewed according to section 4.1 below. All deliverables are to be submitted in the English language. An Executive summary of the findings of Task 3 only shall be submitted in **Arabic language** as well.

### 3.2.2 Progress Reporting

During the fulfilment of the assignment, the Consultant will ensure regular communication with the project team, and will ensure a timely delivery of the expected outputs and will regularly inform the project team of the progress as well as any obstacles that might occur.

The Consultant shall prepare monthly progress reports explaining the progress of each task, the development of project schedule, any difficulty or delay, etc.

### 4. Institutional Arrangements

#### 4.1 Reports Validation Modalities

Provisional approval of submitted deliverables shall take place at each of the defined milestones shown in the delivery schedule (to be agreed with the Consultant at the start of the project). It is expected that the Project Committee comments shall not exceed Ten (10) Working days from the receipt of the deliverable of a specific milestone.

On submittal of the deliverable, the Project Committee shall respond and its decision may either be:

a) Approval, or

b) Approval with reservations upon which the Consultant shall reply within ten working days under penalty of rejection

c) Rejection with clear justifications.

### 5. Duration of work

#### 5.1 Delivery Schedule
The Consultant is expected to complete and submit the deliverables specified in the above section based on the following time schedule. Expected overall duration for project completion is **4 months** from date of contract signature with an assigned **70 working days**.

Each deliverable shall include all the required supporting documentation.

The deliverables and schedules include the following:

<table>
<thead>
<tr>
<th>Task</th>
<th>Deliverables</th>
<th>Expected Duration to Complete</th>
<th>Target Due Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Deliverable 1</td>
<td>Minutes of Kick off meeting</td>
<td>Week 1</td>
<td>May 29 June 19</td>
</tr>
<tr>
<td></td>
<td>Work Plan</td>
<td>Week 4</td>
<td></td>
</tr>
<tr>
<td>Deliverable 2</td>
<td>Analysis of production processes for the selected industries</td>
<td>Month 2</td>
<td>June 22</td>
</tr>
<tr>
<td>Deliverable 3</td>
<td>Draft CBA Report</td>
<td>Month 3</td>
<td>August 22</td>
</tr>
<tr>
<td></td>
<td>Final CBA Report</td>
<td>Month 4</td>
<td>September 22</td>
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</tbody>
</table>

**6. Duty Station**

The assignment requires deskwork, research, meetings, fieldwork as well as coordination between the different related entities.

The consultant shall conduct the work at their chosen location of convenience and shall be responsible for conducting the required field visits in both Chekka and Zouk Mosbeh areas.

Bi weekly progress meetings as well as any other required meeting with the Project Committee shall take place at the premises of the Ministry of Energy and Water.
7. Requirements for Experience and Qualifications

7.1 Academic Qualifications:

University degree (at the Masters level) in engineering, economics, energy, or closely related fields. PhD is an asset.

7.2 Years of experience:

At least 10 years of relevant experience in the energy sector.

7.3 Technical experience:

The consultant shall have:
- Local experience as a must,
- Good knowledge in preparing technical studies related to the energy sector, and in particular, has worked previously with government entities/authorities in relation to energy production, energy efficiency, scenario development, infrastructure analysis, and/or policy recommendations,
- Knowledge of national policies and plans,
- Previous experience in preparation of similar studies, reviews, and sectorial recommendations is an asset.

7.4 Competencies:

- High proficiency in English languages, Arabic is an asset
- Demonstrable analytical skills,
- Excellent interpersonal and communication skills,
- Excellent analytical, and facilitation skills, and
- Ability to meet deadlines and prioritize multiple tasks.

8. Scope of Price Proposal and Schedule of Payments

The consultant shall be reimbursed in an all-inclusive lump sum amount linked to the submission of each deliverable. Deliverables and payments are based on the below schedule:
<table>
<thead>
<tr>
<th>Task</th>
<th>Deliverables</th>
<th>Expected Duration to Complete</th>
<th>Payment Amount</th>
</tr>
</thead>
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<tr>
<td>Deliverable 1</td>
<td>Minutes of Kick off meeting</td>
<td>Week 1</td>
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<tr>
<td></td>
<td>Work Plan</td>
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</tr>
<tr>
<td>Deliverable 2</td>
<td>Analysis of production processes for the selected industries</td>
<td>Month 2</td>
<td>40%</td>
</tr>
<tr>
<td>Deliverable 3</td>
<td>Draft CBA Report</td>
<td>Month 3</td>
<td>40%</td>
</tr>
<tr>
<td></td>
<td>Final CBA Report</td>
<td>Month 4</td>
<td></td>
</tr>
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</table>

**Definitions**

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBA</td>
<td>Cost Benefit Analysis</td>
</tr>
<tr>
<td>Consultant</td>
<td>The Expert that will be awarded this contract</td>
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<tr>
<td>Consultancy Services</td>
<td>The development of a Pilot Study to further assess the applicability of switching from conventional fuels to natural gas in the industrial sector in Lebanon, particularly in the industrial zones of Chekka and Zouk Mosbeh.</td>
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<tr>
<td>GoL</td>
<td>Government of Lebanon</td>
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<tr>
<td>LPA</td>
<td>Lebanese Petroleum Administration</td>
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<tr>
<td>MoEW</td>
<td>Ministry of Energy and Water</td>
</tr>
<tr>
<td>Project Manager</td>
<td>SODEL Project Manager</td>
</tr>
<tr>
<td>Project Committee</td>
<td>Committee formed by MoEW, LPA &amp; UNDP that will review and validate the Consultant’s deliverables</td>
</tr>
<tr>
<td>SODEL Project</td>
<td>Sustainable Oil and Gas Development in Lebanon, is a UNDP Project being executed by the LPA and the MoEW</td>
</tr>
<tr>
<td>UNDP</td>
<td>United Nations Development Programme</td>
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