EGYPT

FEASIBILITY STUDY AND ENERGY OPTIMIZATION STUDY FOR THE NASR PETROLEUM COMPANY (NPC)

1. PROJECT BACKGROUND

The European Bank for Reconstruction and Development (the “EBRD” or the “Bank”) is committed to “attach particular importance to operations which promote energy and resource efficiency, waste reduction, resource recovery and recycling, the use of cleaner technologies and the promotion of renewable resources”. Particularly through its Green Economy Transition\(^1\) (“GET”) initiative, the Bank aims at promoting sustainable resource efficiency and innovation in three areas vital for countries where the EBRD invests: energy, water and materials. The rapid growth in demand for resources, volatile prices, and growing environmental concerns including those about the impacts of climate change, has made resource efficiency a priority for all countries. With the above in mind the EBRD is considering providing finance to the Nasr Petroleum Company (“NPC” or “Plant” or “the Client”), a subsidiary of EGPC\(^2\), for the implementation of an Investment Program (“the Project”).

The Nasr refinery in Suez is operated by NPC with a crude design capacity of 146,000 BPSD and it is basically a topping and reforming refinery. The Plant is considering implementing a New Hydrocracker (capacity of about 4,600 tons/day) with feed streams of Vacuum Gasoil (VGO) from the Vacuum Distillation Unit (VDU) and Heavy Coker Gas Oil (HCGO) from a Delayed Coker Unit (DCU) from the Suez Oil Petroleum Company (SOPC). Therefore the investment relies on the integration with SOPC, which is undertaking an investment program of upgrading the DCU. Please refer to Annex I for an overall Block Flow Diagram (BFD) of the integrated facility. Basic products will be LPG, Naphtha, Diesel and Unconverted Oil and all final products will be in line with EURO V specifications. Preliminary investment cost is estimated at around 600 mln USD, excluding Outside Battery Limits (“OSBL”).

\(^1\) [https://www.ebrd.com/what-we-do/get.html](https://www.ebrd.com/what-we-do/get.html)
\(^2\) EGPC: Egyptian Petroleum Corporation
2. OBJECTIVES

The Bank is considering appointing a Consultant (“Consultant”) with the overall objective to assess the feasibility for the Investment being proposed by the Plant in line with the investment strategy of EGPC, market conditions and also provide advice on the energy efficiency and energy solutions solution(s) for the optimal configuration(s) integrated also with SOPC. Additionally under this scope is to understand EGPC/NPC’s current situation, its investment strategy and key criteria and to identify the market sectors offering these investment opportunities. This will include:

- Understand EGPC/NSR’s objectives and reasoning for the investment and the long-term strategy and current competencies;
- Confirm feedstock / raw material availability within NSR along with a clear definition of the interactions of NSR with neighboring SOPC;

With the involvement of the Consultant the Client will have access to the best practice in the implementation of the Project and procurement of works, goods and services, as well as advice on specific technical issues including Environmental & Social requirements³. Therefore the Bank wishes to engage a consultant (the “Consultant”) to work on the above basis and with the Plant technical staff, in order to support EBRD and the Company management in the investment decision.

3. TASKS

The tasks to be executed are defined below in order to assist the development of the feasibility study for the configuration but are not limited:

Market Study

- Provide a supply/demand balance for both domestic market requirements and export opportunities from the Plant stemming from the Investment being proposed;
- Assess and determine appropriate feedstock basket(s) for the feasibility study;
- Provide an overall feedstock and product pricing basis for the feasibility study. There is a need to identify the potential products to be targeted;

The following will have to be evaluated in detail:

³Please note that all projects financed by the Bank are required to meet the Bank’s E&S requirements which include reference to EU standards and EU BAT requirements
• **Feedstock requirements and availability**
  Listing of all key feedstock / raw material required for the production of the products and comparing them against their availability.

• **Synergy and strategic benefit with SOPC**
  Opine on the justification on strategic grounds and operational considerations and what could be the key strategic benefits to both NSR and SOPC. Potential synergy with SOPC existing or future operations need to be considered.

• **Commercial issues & Risks**
  Whether any commercial issues related to overall operations exist and level of perceived risk in terms of market, technology, substitute products, entry barriers, etc.

• **Market Volumes, Growth and Trends**
  Categorisation of available market demand volume (as large, moderate, small) from regional and export market perspective. Long term outlook for annual demand growth rate is categorized (as low, moderate, and strong).

• **Product Price Set**
  The consultant is expected to provide a forecast or maintain an economic model for the major refinery products. It is anticipated that the Consultant will produce or procure a production/economic models to perform the analysis and develop future projections for prices as well as cost competitiveness. NSR can also provide a price set to the Consultancy to carry out the Assignment, which will be compared and critically reviewed.

• **Logistics / handling issues**
  Any concern or cost issues involved in logistics and handling of the product, e.g.: VGO, storage for petcoke, etc.

**Capital Cost Estimate - (+/- 30 to 40%)**

The consultant will critically assess the proposed cost estimate and prepare a cost estimation plan to calculate the capital costs of up (+/- 30-40%) for ISBL/OSBL capital cost estimates. When preparing the new units’ ISBL portion of the cost estimate, there will be a need to correlate the capital cost of process units and utilities as a function of unit capacity against project cost data. This activity is sensitive to differences not only in capacity but also
location, date of EPC contract award or other contractual agreements being considered, technological differences and a variety of other factors. Unallocated costs (contingency) should be included in the total project cost to allow for unknowns, data inaccuracies and other deviations from the estimated project budget that cannot be itemised at this stage of the project, but which may be incurred. Capital cost estimates should be prepared for each development opportunity.

**Material/Energy Balances, Utilities, Catalyst and Chemicals**

Prepare the material balances, energy/utility balance, catalyst and chemical requirements of individual units as well as of the total refinery for the options being considered, in order to estimate operating costs. The unit capacities will also be outputs and will be used for capital cost estimation.

**Plot Area Requirements**

Develop a conceptual high-level assessment on the layout and approximate plot area requirements for the options being considered. Existing site constraints will be taken into consideration and for ISBL/OSBL and should take into consideration also buildings, firefighting, waste water facilities, etc. As above, these could play a role in the investment evaluation.

**Energy Optimization & Efficiency Review**

The consultant will also undertake an Energy Optimization review of the proposed configuration and recommend the optimal solution for the proposed scenario and integration with SOPC along with but not limited to:

- Benchmarking against known Key Performance Indicators (KPIs): Energy Intensity Index (EII), Nelson Complexity Index (NCI), etc
- Reconstruction and modernisation of Power and Heat Supply systems (e.g. boilers, turbines and generators, I&C systems, etc.);
- Reconstruction and modernisation of condensers and cooling systems (improve condenser surface cleaning, vacuum system, cooling towers etc.);
- Reconstruction and modernisation of auxiliary systems (water treatment, instrumentation & control systems etc.);
- Investments in improvement of Managements Systems (e.g. Energy Management System, Asset/Turnaround Management, Quality Management, Environmental Health and Safety).
- Financial Analysis for each measured proposed
- Analysis of the GHG potential in each Energy Efficiency project and undertake a carbon intensity benchmarking analysis as per the relevant EU-ETS methodology for the downstream oil refinery sector for the current situation and for the future configurations.

**Financial Analysis**
The Consultant will produce a discounted cash flow model to calculate the comparative economic performance of the investment. The basic economic assumptions will be discussed with EGPC & NSR, but as an indication it is expected that the economic modelling will include cash flow with and without taxes but without financing options, as the economic model will be for assessing the investment being considered. All related assumptions should be clearly stated. There will be a need to conduct sensitivity analysis on various issues: Capital Cost, Operating Costs, Product Prices, Refinery Gross Margin, etc.

**Definition of Facilities**
A thorough description of the refinery configuration that will include but not limited to:

- Plant overall block flow diagram with feedstock, products and by-products, utilities and energy balance;
- Definition of process facilities with unit capacities, basic quality characteristics, simplified process flow diagrams, etc;
- Basic Infrastructure Information;
- Energy Optimization Information;
- Compliance with Egyptian environmental regulations and EU BAT Conclusions for the refining of mineral oil and gas (specifically technologies employed and BAT-AELs) as required by EBRD’s Environmental and Social Policy (Performance Requirement 3). The requirements of the Seveso III Directive also need to be considered.
- Advise on Preliminary Procurement and Contracting Strategy for execution:
· The Consultant shall advise the Client on a preliminary procurement and contracting strategy for the Project with the overall aim of minimising overall Project implementation risks and ensuring the successful implementation of the Project in an economic and efficient manner and in accordance with best practice. This should be in line with EBRD’s Procurement Polices and Rules (PP&R) and specifically the Procurement Rules for Public Sector Operations. This should include also advice with regard to issues such as; prequalification, single versus multi-stage tendering, procurement methods, contract packaging, forms of contract and interface and risk management.

· The Consultant shall advise the Client on how to develop a preliminary procurement plan (based on EBRD’s standard template) which will describe the procurement process and a preliminary schedule for implementation.

4. DELIVERABLES

The Consultant will provide the Client and the EBRD with information, designs, data and documentation through submission of reports prepared during the course of its service. Reporting will include at least the following:

<table>
<thead>
<tr>
<th>Report</th>
<th>Date</th>
<th>No. of Copies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inception</td>
<td>Site Visit + 3 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Intermediate Report/Presentation</td>
<td>Mobilization + 10 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Draft Final Report</td>
<td>Mobilization + 16 weeks</td>
<td>1</td>
</tr>
<tr>
<td>Final Report</td>
<td>Within 2 weeks of receiving comments from all parties</td>
<td>1</td>
</tr>
<tr>
<td>Final Presentation</td>
<td>To be confirmed in due course</td>
<td>1</td>
</tr>
</tbody>
</table>

• **Documentation Supply**: all documents have to be delivered in English and the study has to be delivered in 1 paper copy and 2 electronic copies (CD/DVD) to the EBRD office in London. The electronic copies should be in the following file format: text - MS Word 2010, tables - MS Excel 2010, schemes - MS Visio 2010, drawings - AutoCAD 2010.

• The **Final Report** shall include the following text: “Please be advised that the report has been prepared exclusively for EBRD and is provided to the Company for illustration purposes only. EBRD makes no representation or warranty, express or implied, as to the accuracy or completeness of the information set forth in this report. EBRD has not independently verified any of the information contained in the report and EBRD accepts no liability whatsoever for any of the information contained in the report or for any misstatement or omission therein. The report is confidential and should not be released to anyone other than the project team / senior management at the Company. The report remains EBRD's property, it can only be used by EBRD internally for evaluation of similar projects and no information or data from the report will be used or exposed to any 3rd party.”.

• **Final Meeting/Presentation**: The Consultants will submit a brief presentation (up to 25 slides) summarizing the scope of the project, main findings, technical proposal and conclusions of the related study in Microsoft PowerPoint. The results of the assignment will be presented in a final meeting to the Executive Management of EGPC & APC. The Consultant should make a budget provision for this on-site presentation.

• The consultant is to propose dedicated experts (subject to approval by EBRD) as part of the team and must submit references in the business of making the same or similar analysis (in terms of volume and content). Reference must be made in writing, with contacts so that they could be checked.

• The Consultant is to submit a proposal with the approach, the budget and the time schedule for executing the work.

### 5. IMPLEMENTATION ARRANGEMENTS

The assignment is expected to start in February 2020 and have duration of 5 months. The Consultant will carry out a site visit at the Company’s facilities located in Egypt and will report to the EBRD’s Operation Leaders, Mr. Demetris Koufos (koufosd@ebrd.com), +44 20 7338 7934, based in London) on all aspects of the Assignment.