**SCOPE OF WORK**

**Part-A: Detailed Market Feasibility Study Weak Nitric Acid (WNA) & Ammonium Nitrate (AN)**

The Scope of Work for carrying out a detailed Market Feasibility study is expected to consist of (but not limited to) the following aspects:

1. **Product Analysis:**

* Product Characteristics of WNA & Ammonium Nitrate (AN)
* Specification: The specification of the product
* Product Applications: Various applications of WNA & AN along with the sector wise consumption and pattern.

1. **Trade Analysis**:

* Market assessments for the regional and country level segments, Analysis of Indian demand of the products for past 5 years and next 10 years (Captive as well as Merchant), region-wise as well as end use segment-wise.
* Product Analysis to be done with respect to identification of specific consumption sectors and major consumers therein.
* Import details of WNA & AN during the last five years including sector wise consumption and purchase from domestic / import (for various uses of WNA & AN). The import details would include the country wise import.
* Export details during the last five years including country wise and sector wise export.

1. **Price Analysis:**

* Domestic price: Domestic price fluctuation of WNA & AN - last 5 years manufacturer wise and that too with specific mention about ex-works and net price after all discounts if any. For WNA price of various grades of WNA as such may be presented.
* CIF and FOB price Analysis of both Import and Export of WNA & AN with country wise and year-wise breakup.
* Price drivers: The main factors influencing the price of WNA & AN.
* Price forecast of WNA & AN (domestic and import) up to 2030.
* Consultant shall quote all the prices exclusive of any taxes however inclusive of custom.
* Consultant shall also mention impact of any past, proposed or probable anti-dumping duty.

The consultant would provide price forecasting of the products with detailed description of:

1. Price forecasting methodology
2. Factors driving the price forecast
3. Trends in prices
4. Price setting mechanisms
5. **Demand Supply Analysis:**

* Indian installed capacity and Indian producers - Period April 2016 to July 2021, upcoming plants/expansion and their capacity are also to be incorporated.
* Profile of Indian producers: Competitive landscaping mapping: Market share analysis of the industry players who are selling WNA & AN.
* Existing Production capabilities (installed capacity, last 5 years production, and operating rate), firm planned capacities, speculative capacities & major planned expansions/ closures to be considered for supply analysis.
* Future production estimate - Period August 2021 to March 2030.
* Demand drivers: Detailed analysis of the major consumers of WNA & AN, pattern, and future predictions. The imported WNA & AN used for various purposes is also to be incorporated. Special focus to be made on the impact area of around 300 km radius in and around Shahjahanpur. The lead distance may be indicated while assessing demand outside periphery of 300 km.
* Thrust area for demand: Major emerging / expansion sectors which would increase the demand.
* Consultant to clearly indicate the demand-Supply & operating rate forecasting methodology along-with all assumptions and considerations made.
* Analysis of end user segments: Comprehensive analysis of end user segments.
* Supply side drivers to also be incorporated.
* Current industry practices prevalent for product movement in India and globally to be indicated by consultant. Consultant also to identify key constraints in handling, logistics and transportation including safety concerns over long distance transportation of WNA & AN.
* Consultant shall specifically mention about the implementation of other proposed projects.
* Supply analysis of WNA and AN should also be bifurcated among merchant sales and supply for further consumption.

1. **Recommendation**:

* Recommendation for proposed sales capacity based on demand-supply gap and future market scenario. The impact of new projects and other drivers are to be incorporated in final recommendation.

Note: Consultant should provide the working for capacity projection, demand, supply and future projection in excel mode to the owner.

**Part-B: Techno-Economic Feasibility Report (TEFR) for an integrated WNA & AN plant:**

The Scope of Work is for carrying out a detailed study for preparation of Techno-Economic Feasibility Report of an integrated WNA & AN project consists of various aspects which are necessary for preparation of a report of such kind.

The scope of work for preparation of TEFR shall include but not limited to the following:

1. Comprehensive Market Study as per scope defined in **Part-A.**
2. Fixation of plant capacity & Project configuration - Capacity of WNA & AN plant at Shahjahanpur shall be fixed based on surplus ammonia available at respective locations and sustainable demand-supply gap arrived at after comprehensive market survey.
3. Description of manufacturing process & available process technology of WNA & AN along with process flow diagram and specific consumption of raw materials and utilities. Consultant also to state the technology used in running plant in India and highlight the latest trends in process licensor / technology. The description also to include the following:
   1. Brief details of catalysts and chemicals and their typical requirement
   2. Size of land required (approx.)
   3. Adequacy check of existing offsite and utility facility for sharing the proposed integrated WNA and AN plant.
   4. Summary of various effluent & emissions and technologies available to treat / meet the statutory norms.
4. Financial Analysis: The Financial Analysis shall be done considering project cost of a new WNA & AN plant. It would include:
   1. Project cost estimation of new WNA & AN Plant along with necessary offsite & utilities. The accuracy of estimate shall be (+/-) 20%
   2. Cost of production
   3. Profitability projections
   4. Financial indicators
   5. Sensitivity Analysis

Note: Consultant shall provide the specific details of consumption, capacity, utility requirement, other cost etc. and proposed financial model will be prepared in co-creation mode with KRIBHCO.

1. Government policies and regulatory issues: The different government policies and all the relevant Legal / Statutory Compliances and Environmental / Ecology Norms, PESO/CCOE Norms are to be incorporated in the report.
2. The report should clearly mention all the Import and Export Policies, Domestic Production Govt. norms, Transportation and rules for Vendor registration.
3. Time Schedule of Total Project including all milestones.
4. SWOT Analysis
5. Comparative analysis of both the sites based on Market study and TEFR.
6. Recommendations