

**Technical specification & scope of supply**

(Pipe Natural Gas)

Name of Vendor .....

Confirmation/comments on the conditions given below are mandatory.

S. No.	Description	Vendor confirmation/ comments
1	<b><u>Pre qualification criteria:-</u></b> a) The supplier must have authorization from PNGRB for supply of PNG in Bhopal district. Authorization copy to be submitted.	
2	<b><u>Scope of Supply:-</u></b> a) Supply of piped natural gas on formula based price for 3 years contract period. The Formula shall be based on combination of Henry Hub (HH) and Japan Crude Cocktail (JCC).	
	b) The gross calorific value of piped natural gas to be supplied shall not be less than 8500 KCAL/SCM.	
	c) The natural gas to be supplied through pipeline (i.e PNG) inside of BHEL Bhopal factory premises up to designated place inside GPX division. Pipeline is in the scope of the supplier.	
	d) The laying of pipeline from supplier's pipe network (outside of BHEL) to MRS/DRS station and up to GPX division, inside of BHEL, along with necessary approvals, testing, certification etc. is in the scope of supplier.  Suppliers should visit the site before submitting the offer.	
	e) To lay any pipeline inside BHEL Bhopal premises, the supplier has to first submit the layout drawing to BHEL representatives and shall start the work post approval only.  Supplier has to provide suitable markers above ground level, to identify the underground PNG pipeline at suitable distance.  Civil works related to laying of PNG pipeline till GPX division shall be in the scope of supplier only.	
	f) Supplier shall set up gas metering, regulating and supply (MRS/DRS) system in open area with all essential accessories as per PNGRB guidelines and applicable regulations at BHEL Bhopal factory premises. The MRS/DRS shall have gas leakage detection and alarm system.  The required area layout with dimension to be submitted.	
	g) All equipment/parts of MRS/DRS system like regulators, PRVs, gauges, valves, piping, pipe fitting, cable, flow meters, auxiliaries, accessories etc. will be in supplier's scope.	
	h) The capacity of installed MRS/DRS system shall meet the daily gas demand variation from 300 SCM/hr (min.) to 1000 SCM/hr (max.). Performance variation of $\pm 10\%$ will be permitted	
	i) Operation & Maintenance of entire system till gas metering outlet valves at GPX division with material/spares, will be on continuous basis and under supplier's scope. Supplier will maintain minimum inventory of spares to attend the breakdowns, if any.	

	<p>j) To lay gas pipelines and install MRS/DRS inside of BHEL, supplier has to obtain necessary permission/license from statutory authorities and maintain the same at their own cost.</p>	
	<p>k) Supplier shall comply with all the applicable/relevant acts, rules and statutory requirements wherever/whenever it is needed.</p>	
	<p>l) The requirement of gas by users inside BHEL is continuous and for any extent during 24 hrs, 365 days in a year (on all working days, Sundays &amp; holidays in all three shifts).</p>	
	<p>m) Gas pressure reduction system of required capacity for second stage (as per pt. 3.c.ii below) is in the scope of supplier.</p>	
	<p>n) The desired GCV (not less than 8500 Kcal/SCM) and gas supply pressure (First stage- min. 2 bar ; Second stage-min. 50 mbar) should be maintained by supplier in such a way that it can meet the peak demand at any time.</p>	
	<p>o) The party has to ensure uninterrupted gas supply to BHEL. Necessary arrangement must be made to ensure a stand by supply within 3 hour to meet any gas supply interruptions due to any problem in gas supply pipelines outside or inside of BHEL premises, in MRS/DRS system till gas metering outlet valves at GPX.</p>	
	<p>p) Power cabling from BHEL supply point to user point and further control/reduction/UPS is in the scope of supplier.</p> <p>BHEL will provide electricity 230 V <math>\pm</math>10%, 1 phase, 50 Hz, nearer to MRS/DRS and metering point, as per layout, free of cost.</p>	
	<p>q) Any other items which is not covered but essentially required for smooth functioning and safety of the PNG setup, shall also be in the suppliers scope.</p>	
	<p>r) Supplier has to provide necessary assistance for the certification of BHEL's internal pipeline for PNG supply. The Internal Pipeline (IP) certification work will be done by BHEL.</p>	
	<p>s) Supplier has to submit the copy of below mentioned documents before starting the PNG supply to BHEL Bhopal:-</p> <ul style="list-style-type: none"> <li>i) Necessary permissions / licenses from regulatory bodies as applicable.</li> <li>ii) Testing and certification documents of pipeline, MRS/DRS etc. as per PNGRB or CCOE guidelines/ rules as applicable.</li> <li>iii) Calibration certificate of the flow meter, pressure gauges, safety valves etc.</li> <li>iv) GA, P&amp;I drawing of MRS/DRS</li> <li>v) As built drawing of complete pipeline laid by the supplier inside BHEL premises.</li> <li>vi) MSDS of PNG</li> <li>vii) Emergency response procedure / document in case of gas leakage/fire.</li> </ul>	
3	<p><b><u>Specification &amp; technical requirements :-</u></b></p> <p><b>a) Gas Quality:-</b></p> <ul style="list-style-type: none"> <li>i. GCV shall not be less than 8500 Kcal/SCM. Latest test &amp; constituent analysis report shall be submitted by the suppliers along with technical offer. The same shall also be submitted as and when required during contract.</li> <li>ii. <b>Odourisation:</b> The gas must have distinct odour/odorant as per PNGRB norms to detect its leakage and ensure safety.</li> </ul>	

	<p><b>b) Gas Quantity:-</b></p> <ul style="list-style-type: none"> <li>i. Annual: Approx. 1,50,000 ±20% MMBTU</li> <li>ii. Monthly: Approx 12500 ± 20% MMBTU</li> <li>iii. Daily : Approx 200 to 400 MMBTU</li> <li>iv. Hourly: Approx.: 10 to 40 MMBTU</li> <li>v. The gas shall be supplied on “Reasonable endeavour (RE) basis” which means that there shall not be any minimum assured quantity for the payment on daily, fortnightly, monthly or annual gas consumption. Payment of gas shall be strictly in accordance to actual gas consumption (in MMBTU) and rate worked out from formula only”.</li> <li>vi. Advance intimation of approx. monthly quantity for next (i.e. subsequent) month will be given by BHEL on or before 15<sup>th</sup> of every month.</li> <li>vii. The monthly intimated quantity may vary by ± 20%.</li> <li>viii. UNIT “MU” STANDS FOR “MMBTU”.</li> </ul>	
	<p><b>c) Gas Pressure:-</b> Two stage reduction:</p> <ul style="list-style-type: none"> <li>i. <b>1<sup>st</sup> Stage (i.e at MRS/DRS outlet):</b> Constant gas pressure 2-4 kg/cm<sup>2</sup> for boiler.</li> <li>ii. <b>2<sup>nd</sup> Stage (i.e after boiler tapping):</b> Constant gas pressure of 50-100 millibar @ flow of 0.5 to 12 MU per Hr, for LPG pipeline. Supplier has to supply 1 no. regulator to meet the rating as per the second stage reduction.</li> </ul>	
	<p><b>d) Stand by facility:</b> The MRS/DRS &amp; metering shall have standby equipment (i.e. dual stream) to ensure the supply of gas in the case of failure of existing equipment.</p>	
	<p><b>e) Quantity measurement:-</b></p> <ul style="list-style-type: none"> <li>i. PNG Gas volume shall be measured in SCM at GPX division inside of BHEL Bhopal. The flow meter shall be calibrated &amp; have digital display for flow rate and flow totalizer or cumulative quantity. The flow meter shall have pressure &amp; temperature compensation for accurate reading.</li> </ul> <p>The supplier shall have a standby meter facility in case of its breakdown. The calibration of flow meter is essential at every two years’ interval from a recognized test house or OEM, report to be submitted to BHEL. The calibration shall be in the scope of supplier.</p>	
	<ul style="list-style-type: none"> <li>ii. The cumulative reading of gas flow meter/flow controller in SCM will be recorded by BHEL representative every day at approx.9 am. Joint reading (BHEL &amp; Supplier representative both) will be taken as per the billing cycle.</li> </ul>	
	<ul style="list-style-type: none"> <li>iii. Supplier shall submit the daily average GCV report of gas supplied to BHEL Bhopal from M/s GAIL, along with invoice for MMBTU calculations. The total MMBTU will be calculated on GCV basis.</li> </ul>	
	<ul style="list-style-type: none"> <li>iv. The billing shall be done in MMBTU units (refer as MU i.e UNIT MU STANDS FOR MMBTU). 1 MMBTU=252000 Kcal. The MMBTU conversion formula is:-  <b>MU = {Daily Gas Quantity (in SCM) x Daily Gas GCV (in Kcal) }/ 252000</b></li> </ul>	
4	<p><b>Gas Pricing &amp; PVC</b></p> <ul style="list-style-type: none"> <li>i. The supplier shall quote as per the detailed formula given in price bid (annexure-A) which is based on combination of Henry Hub (HH) and Japan Crude Cocktail (JCC).</li> </ul> <p>Additional pricing components (If any), have to be mentioned by the supplier in technical bid.</p>	

	<p>ii. Supplier shall define, specify &amp; mention separately the variable pricing components/ elements of formula, their time period &amp; change frequency to be considered for calculation and the applicable taxes &amp; duties in their offer in “values” or “%” clearly.</p>	
	<p>iii. Signed unpriced copy of the price bid to be submitted along with technical bid as an acceptance to the price bid formula.</p> <p>Applicable taxes &amp; duties with code heads like HSN code, CTH code etc. also mentioned in unpriced bid submitted with technical bid.</p>	
	<p>iv. Vendor has to quote gas price for the month of “Feb 2024” in price bid for tender evaluation. TT selling rate as per SBI card as on 15.02.24 to be taken for the same.</p>	
	<p>v. Price variation clause (PVC) will be applicable as per change in variable components/elements of formula and applicable taxes as declared in contract. The PVC shall be applicable from the start of supply and the gas rate will be calculated for the supply as per the billing cycle.</p>	
	<p>vi. The index based variable components/elements (i.e HH &amp; JCC and US dollar exchange rate) shall be taken from sources/websites, mentioned below:-</p> <p>a) HH-<a href="https://www.nrg.com/resources/energy-tools/nymex-settlement-history.html">https://www.nrg.com/resources/energy-tools/nymex-settlement-history.html</a></p> <p>b) JCC - <a href="https://www.paj.gr.jp/english">https://www.paj.gr.jp/english</a> » Oil statics » Oil Import Price</p> <p>c) US dollar exchange rate - TT selling rate as per SBI card (for transactions above Rs. 10 lacs).</p>	
	<p>vii. The value of the index based components / elements (i.e HH &amp; JCC and US dollar exchange rate) for PVC formula shall be taken as below:-</p> <p>a) HH - Denominated in USD per MMBTU shall be the NYMEX (M) which is the final settlement price of Natural Gas (Henry Hub) Futures Contract, for the month immediately preceding the delivery month.</p> <p>b) JCC – Denominated in USD per barrel. This value shall be the average value of previous 9 months, just before the preceding month from the supply month.</p> <p>c) US dollar exchange rate - At the prevailing TT selling rate as per SBI card (for transactions above Rs. 10 lacs.) applicable on the last day of the billing cycle. In case the last day of the billing cycle happens to be a bank holiday then the SBI card rate as on the previous bank (SBI) working day shall be taken.</p> <p><b>EXAMPLE:- Let PNG supply month is January 2024. Then value of above variables shall be as below:-</b></p> <p>a) HH - Value of HH-NYMEX (M) shall be of Dec-2023 (Final Settlement Price)</p> <p>b) JCC - Value of JCC shall be Average price of nine months from Nov-2023 to March-2023.</p> <p>c) US dollar exchange rate – TT selling rate as on 31<sup>st</sup> January 2024. If 31<sup>st</sup> January 2024 happens to be bank holiday, then TT selling rate of 30<sup>th</sup> January 2024 shall be taken and so on.</p>	
	<p>viii. The formula, declared variable pricing components/elements and change frequency shall remain firm/vary as finalized at the start of contract, no further addition, elimination or variation will be done till the entire contract period.</p> <p>The applicable taxes, duties and any component declared by Government/PNGRB, if changed during the contract period the same</p>	

	will be applicable from the date of its application.	
	ix. In case GST becomes applicable during the contract period the same shall be paid extra to supplier as per actual after verification of the same in GSTN and fulfillment of other statutory requirement as per BHEL norms. GST benefit, if applicable, must be transferred to BHEL.	
5	Supplier will not be permitted to take out or sell PNG from BHEL Bhopal factory premises during the contract period.	
6	<p><b><u>BHEL will provide free of cost:-</u></b></p> <p><b><u>a) Electrical Supply</u></b></p> <ul style="list-style-type: none"> <li>i. Electrical power supply of 230 V <math>\pm</math>10%, 1 phase, 50 Hz nearer to supplier's panel at MRS/DRS and metering point, through isolation switch, as per layout.</li> <li>ii. Suppliers have to quote/mention approx. load requirement in kW/kVA (kwh).</li> <li>iii. Electrical earth pits if required, supplier to specify the details.</li> <li>iv. Area lighting for MRS/DRS and metering point.</li> </ul> <p><b><u>b) Fire fighting measures</u></b></p> <ul style="list-style-type: none"> <li>i. Water supply at a single point (untreated) or water hydrant, supplier has to specify details of water requirement at initial stage.</li> <li>ii. DCP type fire extinguisher (2 nos.)</li> </ul> <p><b><u>c) Land, Civil Work and Structure</u></b></p> <ul style="list-style-type: none"> <li>i. Open land for laying of gas pipeline inside BHEL and installation of MRS/DRS and metering point.</li> <li>ii. Necessary civil work and structure for installation of MRS/DRS system and metering point only. Supplier has to submit the layout and details with technical bid.</li> </ul>	
7	<p><b><u>Erection &amp; commissioning: -</u></b></p> <ul style="list-style-type: none"> <li>a) Erection of the complete system till GPX division, as per scope of work, shall be completed within 150 days from date of Lol/PO.</li> <li>b) Commissioning of the complete system must be completed within 30 days from the date of BHEL intimation after readiness of BHEL's system.</li> <li>c) All manpower for unloading, unpacking, placement at the site, erection and commissioning, will be provided by the supplier. Only Space to store material will be provided by BHEL. All tools and tackles including crane, hydra etc if required, for unloading, erection etc, shall also be in the scope of the supplier.</li> <li>d) Care must be taken while carrying out the work to ensure that no structure and installation, fittings or fixtures, roads, pathways etc are damaged. Any damage to the same or any other BHEL property will have to be repaired / restored / replaced, by the supplier failing which the same shall be done at his risk and cost. The decision of BHEL Bhopal on the correctness of the adequacy of any repair / restoration / replacement work done by the supplier or any cost recoverable from the contractor on his behalf shall be final and binding on the contractor</li> </ul>	
8	<p><b><u>Entry of equipment at material gate:-</u></b></p> <p>All equipment shall be entered through material Gate of BHEL with proper entry and stamped by CISF in a triplicate challan on returnable basis so that it can be taken back after completion of contract period.</p>	

9	The supplier shall deploy it's own employees for routine inspection of the PNG pipeline inside BHEL upto MRS/DRS to ensure safety and uninterrupted supply of gas. Supplier has to ensure minimum wage payment to their employee as per the Central. State Govt. regulations/ BHEL Policy/ Practices. BHEL will not provide anyaccommodation to any employee/ workmen of supplier.	
10	Supplier will also ensure that all statutory payments of PF, ESI, etc are made and will follow all the rules of Factory Act. BHEL will be free to check & verify the records from time to time, as per need Supplier will ensure that proper insurance for their personnel have been taken by them for the entire eventuality like injury / loss during contract period. Vendor will indemnify BHEL Bhopal for the above issues.	
11	<b><u>Safety &amp; statutory requirement:-</u></b> a) To lay PNG pipeline and install MRS/DRS inside BHEL, supplier will take necessary permission/ license from regulatory bodies as applicable (if required) on behalf of BHEL including approval of layout at their own cost (including permission/license & its renewal fee), The renewal of permission/license for total set up shall be in supplier's scope till the contract period. Any modification, if required as per statutory rules or process requirement shall be done by the supplier at their cost along with the license fee. b) The supplier shall comply with all applicable rules/ legal requirement of Central & State Govt and amendments later on as applicable during the contract period. This shall include Factory act/rules, Environmental law, PNGRB/PESO rules, PF/ESI rules, Tax & Excise duty rules, GST etc. c) Supplier should also take necessary insurance for their set up against theft, damage or fire etc. BHEL will not be responsible for any kind of damage of their equipment. d) Supplier should ensure proper safety of all his equipment, material and plant belonging to him or BHEL, during work inside BHEL. Supplier shall be responsible for enforcing all safety rules and regulations as applicable at the work place and as notified from time to time. e) The supplier shall provide PPEs like safety belt, helmet, hand gloves etc. for their workmen/staff and ensure proper use while working in plant.	
12	BHEL will not be responsible for non-availability of power supply on account of grid failure and no claim shall be made by supplier in this regard.	
13	In case of ambiguity with points mentioned elsewhere in various annexures of this tender, the technical specification & scope of supply shall prevail.	
14	Mention the name, mobile no. & email address of the contact person.	

**Note:-**Vendor should submit the confirmation and acceptance of the above points by submitting the signed & sealed copy of above specification sheet along with technical bid. If required separate sheet may be attached for further detailing/deviation.

Date:

Signature & Seal of the supplier