

## REQUEST FOR QUOTATION (RFQ)

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**DESCRIPTION: Request for Quotation for Goods, equipment and chemicals for Milk collection and bulking centres (Milk chillers)**

**DEADLINE DATE FOR SUBMISSION OF RFQ: 15 June, 2016**

**POSTING DATE: 1<sup>st</sup> June, 2016**

The Project Management Unit (PMU) of Sindh Agricultural Growth Project (Livestock Component), Bungalow No. A-7 Khalid Society, Qasimabad, Hyderabad Secretariat has received a grant from the World Bank to improve milk production and to improve the socio-economic status of the of small & medium milk producers through improved and efficient marketing system. It is intended that part of this proceeds will be applied to eligible payments under the contract for Procurement of *for Goods, equipment and chemicals for Milk collection and bulking centres (Milk chillers)*

The PMU (SAGP-L) now invites sealed quotations from manufacturers, authorized dealers and suppliers for the supply of Milk Chillers with appropriate Solar system and milk quality assessment system as per attached Technical specifications.

The Request for Quotation offer and accompanying documents must be received by Project Director SAGP-L, Bungalow No. A-7 Khalid Society, Qasimabad, Hyderabad, no later than **15<sup>th</sup> June, 2016 at 1600 PST.**

### **Terms and Conditions:**

- i. The Quotation must be submitted according to the attached specifications.
- ii. Supplier must quote all the items.
- iii. Taxes will be deducted according to applicable government rules.
- iv. Please quote only one offer.
- v. Quotations must be added, signed and stamped on letter head.
- vi. Quotation must be typewritten.
- vii. Milk Chillers with Solar panel must be delivered and installed at MPG of Mithhro Soomra (near Islamkot) and MPG of Malanhour Khaawiriya in Tharparkar on turn-key basis through PMU of the project and District Project Implementation Unit (DPIU) Tharpakar.
- viii. The Prices indicated in the Price Schedule shall be delivered duty paid (DDP). The price of other (incidental) services, if any, may be mentioned separately.

- ix. Prices shall be fixed and Quote price should be in Pak Rupees.
- x. The Chillers must have warranty and after sales service as mentioned in the specifications.
- xi. The suppliers are requested to give their best and final prices as no negotiations are expected.
- xii. Quotations shall be valid for a period of 30 days after submission.
- xiii. Hundred percent payments will be made after receipt of complete delivery, installation and issuance of inspection certificate.
- xiv. Payment will be made within 15 days after receipt of invoice and document mentioned in above clause.
- xv. Delivery shall be made within **45 days** of supply order. In case of late delivery there shall be **0.1% Liquidated Damage (LD) charges/ week** from contract price, maximum deduction shall be **10%**.

**A. Technical specifications of the Farm Milk Cooling Tanks- 500 L, Direct Expansion, Farm Milk Cooling Tank, and two milking:**

**A.1. MILK COOLING TANK:-**

S. No.	Description	Specification	Quantity
1	Type	Direct Expansion type Milk Cooling Tank, 2 milking.	02
2	Model	OM- /DX 500 L , 2 T- Horizontal	
3	Milk Vessel	2.0 mm 304	
4	Insulation vessel	0.9 mm thick Stainless steel	
5	Evaporator	0.9 mm thick Stainless steel AISI 304. <b>(Laser welded with milk vessel)</b>	
6	Test /Burst pressure of evaporator	36 / 80 Bar.	
7	Lid cover	1.5 mm thick Stainless Steel 304. Mounted with 2 Nos. Springs / springs having Milk pouring Opening with plastic cover	
8	Insulation	Polyurethane foam insulation, 36-90 mm thick, 38-40 Kgs. /M3 density. Environment friendly	
9	Electric / control panel	100% automatic/ digital type.	
10	Legs	S.S with Stainless Steel adjustable Bolts.	
11	Milk agitation	S.S blade driven by slow speed Agitator, 30-36 RPM including level switch for auto stop of gear motor when lid opened beyond 20 Deg. Imported and EC certified	
12	Agitator Motor	Taiwan made, Agitation confirms zero creaming of milk	
13	Milk Measuring	Calibrated Dip Stick provided with Milk Reading chart	
14	Butter Fly Valve at milk outlet	Stainless Steel DN 50 with SMS thread. Milk stopper installed with SS 10 mm rod with proper fitting inside.	
15	Milk thermometer	Digital.	
16	Milk thermostat	Digital. Operation of cooling unit controlled by	

		thermostat. Auto trip at 4 degree C	
17	Refrigerant Control	Thermostatic Expansion Valve and MOP Function	
18	Earthing	Single rod Earthing of chiller with < 1 ohm	

## **A.2. COOLING UNIT**

<b>S. No.</b>	<b>Description</b>	<b>Specification</b>	<b>Quantity</b>
1	Cooling Tank	Mounted with the Tank, Designed for higher ambient + 50 C of Following specs	02
2	Compressor	2 HP (Copland) manufactured under license of Copland under any part of the world	
3	Condenser	Air Cooled, imported or equivalent local brand (Breeze Frost Industries)	
4	Fan	Statically / dynamically balanced fan Motor assembly EC certified –Imported with safety protection grill	
5	Other Specification	<ul style="list-style-type: none"> <li>- CFC free refrigerant, 3- 3.1/2 HP - Hermetic Reciprocating Compressor, 1 phase – 220 Volt – 50 hertz rating.,</li> <li>- Contactor / overload relays from EU / Equivalent origin.</li> <li>- HP/HP switch, Filter drier, sight glass from Danfoss,</li> <li>- By pass solenoid valve with timer for easy start of compressor each time.</li> <li>- Stainless steel Base plate and S.S Cubical for the cooling machine.</li> </ul>	

Transportation & Complete installation and Standard wiring (from electricity meter to the chiller) at chiller site compatible with 1000 liter chiller

### **Warranty:**

Evaporator Leakage	5 Years
Compressor	1 year
Condenser Fan Motor	1 year
Agitator Motor	2 years
Thermostat	1 year

### **B. Voltage stabilizers**

Supply and Installation of Automatic Voltage stabilizer suitable for DX-300 L Milk Cooling tank:-

S. No.	Description	Specification	Quantity
1	Make	Local	02
2	Power Rating	11 KVA.	
3	Input Voltage	from 150 V to 250 Volt	
4	Output voltage	200 to 220 V.	
5	Phase / Hz	single phase – 50	
6	Relay Control System	Two steps up and one step down	
7	Change over switch	32 A Spain.	
8	Circuit breaker	32 A MG	
9	Indication Light	Orange, Green, Red	
10	Amp. Meter	Taiwan made - One per phase.	
11	Volt Meter	Taiwan made	
12	Selector switch	Taiwan made	
13	Body	Powder coated MS body. Any opening is sealed with proper rubber gasket against water leakage	

**Warranty:** One year full parts warranty

### C. Technical Specifications of Solar Power System (Off-Grid) for Milk Chillers of 500 Liters

***(Compressor will be 2.0 HP, 1-phase, 220 volts, 50 Hz):***

Table # 01 lists the specification of equipments for the solar power system including solar PV panels, battery bank, charge controllers, inverters and all standard accessories for solar power system operation and protection. The international and local transportation of all equipments shall also be considered as a part of the installation, testing and commissioning as a turn-key activity.

Sr. No.	Details of Equipments	Unit	Quantity	Brand	Quantity
1	Solar Panel with aluminum frame, IEC 61215:2005	Watts	6000	EU/ UK/ USA	02
	with TUV/VDE Certification from Germany			(TUV/VDE German Certified)	

2	Sealed Maintenance Free Valve Regulated Lead Acid Battery 2V-600Ah. High compression AGM with >99% recombination efficiency- Battery design life: 20 years -- Battery complies with EUROBAT (IEC 896-2), BS 6290 Part 4, IEC 60896-2, IEC 61427, Underwriter Laboratories (UL1989). Cyclic life must be 6300 cycles @ 10% DoD.	kWh	38.4	EU/ UK/ USA
3	High efficiency MPPT automatic solar controller, Functionality for recognition for 12V / 24V / 36V / 48V / 60V battery voltage. Efficiency must be 98% for 48V DC systems. Charge regulation of three stages Bulk, Absorption, Float. Auto Battery temperature sensor, CSA Certified (UL 1741, CSA 107.1, CE EN50178, EN 61000-6-1, 6,-3.	Amp.	120	Schneider
4	High efficiency Pure Sine Wave inverter (Hybrid) with built in AC charger of 100A/140 AC. Efficiency >95%. DC input voltage range of 40/64V DC. AC over-load capacity of surge handling must be at 200% of rated capacity.	kVA	8.5	Schneider France
5	Balance of System including, programmable settings via Xanbus enabled System Control Panel	Set	01	Schneider France
6	PV modules combiner boxes with rated DC circuit breaker (CBs to be installed) for parallel connected PV modules and surge protection devices.	Set	01	Schneider France
7	Earthing/grounding arrangements for solar panels & solar power system.	Set	01	Pakistan
8	Iron made, rust proof, powder coated imported racks for battery bank - imported	Set	01	Imported
9	Galvanized Iron made, rust proof and adjustable mechanical mounting structures	Set	01	Pakistan
10	Civil works concrete foundation along with associated accessories for fixing of mechanical mounting structure	Job	01	Pakistan
11	Multi-strand electric wire 6 mm <sup>2</sup> PV-Interconnection	Feet	590	99.999% Copper
12	Multi-strand electric wire 16 mm <sup>2</sup> for PV to	Feet	590	

	Controller			
13	Multi-strand electric wire 80/100 mm <sup>2</sup> for BB and BoS	Feet	100	
14	Multi-strand electric wire 6/10 mm <sup>2</sup> for AC Input	Feet	295	
15	Multi-strand electric wire 6 mm <sup>2</sup> for AC Output	Feet	295	
16	Multi-strand electric wire 1.5/2.5/4 mm <sup>2</sup> for internal wiring of Load Interconnection	Feet	590	
17	Multi-strand electric wire 6/10 mm <sup>2</sup> for Grounding	Feet	50	
18	PVC pipe ( <i>perforated</i> ) for indoor electrification and battery cable routing.	Feet	50	Pakistan
19	Galvanized iron, PVC coated flexible pipe for cables protection.	Feet	700	Pakistan
20	Galvanized iron glands for cable sealing.	Set	01	Pakistan
21	Cable ties, heat shrink tubes, nut bolts, tape, screws, steel nails etc	Set	01	Pakistan
22	Multi-pole C.B for power distribution - BB to DB and Inverter- 3p/200A (MCCB)	Pcs	02	Schneider France
23	Multi-pole C.B for power distribution DC input to CC - 2p/63Amp	Pcs	02	Schneider France
24	Multi-pole C.B for power distribution - AC Input 3p/32Amp (MCCB)	Pcs	01	Schneider France
25	Multi-pole C.B for distribution - AC Output 3p/32Amp (MCCB)	Pcs	01	Schneider France
26	Multi-pole C.B for power distribution - Change Over 32Amp	Pcs	01	Schneider France
27	Bus-bar cabinet with protection devices & BOS (Internal Components) and Combiner Boxes for PV interconnection with CC	Set	01	Pakistan
28	Bracket Fans - 1 X 18" size for cooling of BB and BoS	Set		Pakistan
29	LED Bulbs (13/10 Watts)	pcs	06	Philips
30	Transportation, Installation, Testing, Commissioning including one-year warranty/guarantee	Turnkey Job		

**Table 1:** Detailed Specification of Equipments for One Solar Power System

**C.1. Electrical Load Details for Milk Chillers of 500 Liters (Compressor will be 2.0 HP, 1-phase, 220 volts, 50 Hz):**

Table # 02 lists the technical specification of electrical equipments having Milk Chiller along with associated accessories to be operated in off-grid areas through Stand Alone Solar Power System.

<b>Peak Electrical Load Details for 500 Liters Milk Chiller</b>						
Sr. #	Description of Electrical Appliances	Power (W)	Quantity	Total Power (Watts)	Operation (Hours/day)	Energy Consumption (Wh/day)
1	Compressor	1492	1	1492	5	7,460
2	Condenser Fan Motor	746	1	746	5	3,730
3	LED Bulbs	13	6	78	12	936
4	Ceiling Fans	100	2	200	10	2,000
5	Bracket Fan for Cooling of Solar Equipments	65	1	65	24	1,560
<b>Peak Electrical Load Details and Energy Daily Requirement</b>				2,581	-	<b>15,686</b>

**Table # 02:** Peak Electrical Load Details and Energy Daily Requirement

**C.2. Electrical Load Patterns for Milk Chillers of 500 Liters:**

Table # 03 lists load pattern of electrical equipments having Milk Chiller along with associated accessories to be operated in off-grid areas through Stand Alone Solar Power System.

cx	Milk Chiller	LED Bulbs (13W*6)	Fans (03)	TOTAL LOAD (Watts)
24 Hr day	Load-1	Load-2	Load-3	
Power (W)	2,238	78	265	2,581
<b>24 Hours' Time</b>	<b>Hourly Operational Time in "Minutes"</b>			
	<b>(Assumption for designing of Solar Power System)</b>			
00:00 – 01:00	5	0	60	2,238
01:00 – 02:00	5	0	0	2,238
02:00 – 03:00	5	0	60	2,238
03:00 – 04:00	5	0	0	2,238
04:00 – 05:00	5	0	60	2,238
05:00 – 06:00	5	0	0	2,238
06:00 – 07:00	40	60	60	2,316

07:00 – 08:00	40	60	60	2,581
08:00 – 09:00	40	60	60	2,581
09:00 – 10:00	20	60	60	2,581
10:00 – 11:00	15	60	60	2,503
11:00 – 12:00	0	0	60	0
12:00 – 13:00	0	0	60	0
13:00 – 14:00	0	0	0	0
14:00 – 15:00	0	0	0	0
15:00 – 16:00	0	0	0	0
16:00 – 17:00	0	60	60	0
17:00 – 18:00	40	60	60	2,581
18:00 – 19:00	20	60	60	2,581
19:00 – 20:00	20	60	0	2,581
20:00 – 21:00	15	60	0	2,238
21:00 – 22:00	5	60	0	2,238
22:00 – 23:00	5	60	60	2,238
23:00 – 24:00	10	0	0	2,238
<b>Operations Hours per day</b>	<b>5.0</b>	<b>12.0</b>	<b>14.0</b>	-

**Table # 03:** Electrical Load Pattern

### C.3. Energy Consumption Pattern for Milk Chillers of 500 Liters:

Table # 04 lists energy consumption pattern of electrical equipments having Milk Chiller along with associated accessories to be operated in off-grid areas through Stand Alone Solar Power System.

Load-1	Load-2	Load-3	Total Consumption (kWh)
0.19	0.00	0.27	0.45
0.19	0.00	0.00	0.19
0.19	0.00	0.27	0.45
0.19	0.00	0.00	0.19
0.19	0.00	0.27	0.45
0.19	0.00	0.00	0.19
1.49	0.08	0.27	1.84
1.49	0.08	0.27	1.84
1.49	0.08	0.27	1.84
0.75	0.08	0.27	1.09



0.56	0.08	0.27	0.90
0.00	0.00	0.27	0.27
0.00	0.00	0.27	0.27
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.00	0.00	0.00
0.00	0.08	0.27	0.34
1.49	0.08	0.27	1.84
0.75	0.08	0.27	1.09
0.75	0.08	0.00	0.82
0.56	0.08	0.00	0.64
0.19	0.08	0.00	0.26
0.19	0.08	0.27	0.53
0.37	0.00	0.00	0.37
<b>Total Energy Consumption per day kWh</b>			<b>15.84</b>

**Table # 04:** Electrical Load Pattern

#### D. Goods and chemicals for Milk Quality Assessment

##### Supply of tools and Glassware required for Milk collection at each MPG

S.No	Items	Specification	Per MPG Quantity
01	Gerber/centrifugal machine manual	With Iron stand, 3 MM iron Angle, 900 – 1100 RPM with 4 tubes Warranty 12 months	1
02	Gerber/centrifugal machine Electrical	1100-1400 RPM 4 tubes. Selector switch with Auto Timer up to 5 minutes, on/off switch. Warranty 12 months	1
03	Auto Milk Measurer	Calibrated stick capacity 10 liters one piece gauge in center. Stainless steel made	1
04	Aluminium Cans	Capacity 40 liter gauge 15 MM weight not less than 5 Kg.	2
05	Butyrometer	HBG 8% Germany	3
06	Lactometer	Made of Germany 20 C	3
07	Glassware supplies for MPG for milk testing (Complete Testing Kit for MPG, Quantity mentioned in bracket)	Wooden Box (1) Steel glass ware stand (1), Pipette 10 ml, (3) Pipette 10.94 ml, (3) Glass Thermometer (3) , Auto measure 1 ml for alcohol, (3)	1 kit

		Auto measure 10 ml for Acid, (3) Reagent Bottle 500 ml for Acid (1) Reagent Bottle 250 ml for Alcohol, (1) Cork for reagent bottles 500 ml (3) Cork for reagent bottles 250 ml (3)	
	Petri Dish	Glass made	3
	Spirit Lamp	Glass made	1
	Test tube	Glass made	3
	Plastic cylinder	For Lactometer 300 ml	1
	Stopper	For butyrometer, rubber made	60
	Sampler	Capacity 100 ml SS made with handle curved on other side	1

**Note: Please quote the separately in serials it should be included with all transportation charges to MPG**

**E. Supply of chemicals each MPG (quantity required for one year is mentioned)**

S.N	Items	Specification	Per MPG Quantity for a year
1	Sulphuric Acid 90 %	In packing of 35kg	128 kg
2	Iso Amyle Alcohol	Pure Germany in Packing of 5Liter	13 liters
3	APT Solution	In Packing of 500 ml	2.19 liter

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