COST ANALYSIS

The estimated cost of producing a prototype model of an LPG-Powered Food Dehydrator

BILL OF ENGINEERING MEASUREMENT AND EVALUATION (BEME)

A PROTOTYPE PRODUCTION OF AN LPG-POWERED FOOD DEHYDRATOR

S/N	Category	Item Description	Quantity Required	Estimated Unit Cost (₦)	Total Cost (₦)	Notes
1	Structural Frame & Outer Casing	Mild Steel Sheet (1.2mm gauge)	2 full sheet (8' x 4')	1,200,000	2,400,000	For outer cabinet panels. Pri highly volatile.
2		Mild Steel Angle Iron (1.5"x1.5")	5 lengths (12ft)	240,000	1,200,000	For the main structural fram
3		Insulation Material fiber glass	3 rolls (50mm thickness)	500,000	1,500,000	Essential for heat retention a efficiency.
4	Internal Chamber & Heat Exchanger	Stainless Steel 304 Sheet (1.5mm)	2 full sheet	2,500,000	5,000,000	Single biggest cost. Mandat heat exchanger, internal linir and trays to prevent corrosic and contamination.
5		Stainless steel sheets 4mm	full sheet	5,000,000	5,000,000	For the construction of a fire chamber
6		Stainless Steel Pipe (2" diameter)	6 meters	300,000	1,800,000	For constructing the heat exchanger core and flue.
7	Heating System	LPG Burner & Nozzle (High Pressure)	1 set	250,000	250,000	A robust burner designed fo higher heat output.
8		LPG Hose (High Quality)	3m meters	10,000	30,000	Must be certified for LPG use
9		LPG Regulator & Valve	1 set	75,000	75,000	Critical safety components.
10	Air Circulation System		1	120,000	120,000	Must be rated for temperatu above 80°C.

11			1	55,000	55,000	To power the fan from a ma outlet.
12			1 set	25,000	25,000	For basic electrical connecti
13	Drying Trays (5 Units)	Stainless Steel Mesh (Food Grade) 5*5mm. The wire of the tray sheet is 0.8mm	3 sq. meters	250,000	750,000	For the tray bases.
14		SS Rod / Flat Bar for Frame	10 meters	30,000	300,000	To fabricate the frames for t trays.
15	Doors & Sealing	Heavy-Duty Hinges	2 sets	10,000	20,000	To support the weight of the insulated door.
16		Door Latch/Handle	1 set	12,500	12,500	
17		Heat-Resistant Silicone Gasket	6 meters	5,000	30,000	To create an airtight seal on door.
18		Viewing Window (Tempered Glass)	1 (0.3m x 0.2m)	35,000	35,000	Optional but useful for monitoring.
19	Finishing & Sundries	High-Temperature Paint	2 cans	27,500	55,000	For the exterior.
20		Welding Electrodes/Rods (Stainless & Mild)		27,250	27,250	Consumables for fabrication
21		Roller caster wheels	4	12,500	50,000	
22		Nuts, Bolts, Screws, Sealant and reveting	-	-	135,000	Miscellaneous items often overlooked.
23		HMI Human Machine Interface			250,000	Human-machine interface

24	Humidity Sensors			90,000	To sense humity of the of in chamber
25	Gas Valve Control Module			350,000	To control the flow of lpg ga
26	Electronic Gas Igniter			200,000	To create spark at burner
27	PID Temperature Controller			200,000	To sense the temperature of chamber
28	Butane Gas Blow Torch			145,000	Burner
29	Flame Sensor			45,000	To sense burning flame
30	Heat resistant cables			120,000	Connection cable
31	Air Circulating fan	4	35000	140,000	To create airflow distributior
32	Four (4) phase stepper motor with driver	4	30000	120,000	To close the air ducts or ven
33	Flexible conduit pipe	5m	15,000	60,000	
34	Circuit breaker MCB 2pole	1	10,000	10,000	For protection against short
35	Indicators, power button (lumped)		45,000	45,000	
36	Power cable(flexible cord)	3m	7,500	22,500	

37		Load cell		125,000	125,000	
38		Data logger		145,000	145,000	
39		Control panel box	1	85,000	85,000	To house the circuitry
40		Transport & Logistics	-	-	250,000	Crucial. Cost of moving materi from various vendors.
41		SUB-TOTAL			21,272,250.00	
42		Contingency (15% - High Inflation Buffer)			3,190,837.50	Essential for unexpected price hikes and wastage.
43		TOTAL ESTIMATED COST			24,463,087.50	
44	Design, Simulation and Optimization	Design, Simulation and Optimization		3,000,000.00	3,000,000.00	
45	Fabrication Labour	Labour Cost for Fabricator/Welder	1	3,500,000	3,500,000.00	
46				**GRAND TOTAL ESTIMATE**	**₦30,963,087.50**	