

Invoice Header

Field	Value
Invoice #	ETG-INV-2025-05
Date	20 May 2025
Supplier	Abc private Ltd
Bill To	National Grid Authority
Project	132 kV Double-Circuit Transmission Line
Payment Terms	Net 30 days
Delivery Terms	DDP (Delivered Duty Paid) job site

Line-Item Details

#	Item Description	Specification / Notes	Qty	Unit Price (USD)	Line Total (USD)
1	Lattice Transmission Tower	60 m, galvanized steel	8	9 800	78 400
2	ACSR Conductor (Conдор)	300 mm², bundled, per km	25 km	3 250	81 250
3	Composite Long-Rod Insulator	120 kN, 132 kV	240	45	10 800
4	Optical Ground Wire (OPGW)	48-core, per km	25 km	1 050	26 250
5	Hardware & Fittings Set	Suspension, tension, spacer dampers	240	18	4 320
6	Installation & Stringing Labor	Turn-key field work	1 lot	35 000	35 000
7	Testing & Commissioning	Line energization & reports	1 lot	12 000	12 000
Subtotal					248 020
VAT (13 %)					32 243
Grand Total					280 263

Grid-System Reference

- **Voltage level:** 132 kV (R-Y-B phase); nominal frequency 50 Hz.
- **Thermal line rating:** 260 MVA per circuit with summer clearance temperature of 75 °C.
- **Total route length:** \approx 25 km; average span 350 m; ruling span calculated for sag–tension charts.
- **Grounding & lightning:** OPGW doubles as shield wire; tower footing resistance $\leq 5 \Omega$.
- **Protection scheme:** Distance protection (zones 1–3) plus differential busbar protection at both 132 kV substations.
- **SCADA integration:** IEC-60870--5-104 gateway provided for real-time telemetry, breaker status, and PMU data.
- **Environmental compliance:** Towers sited to avoid migratory-bird flyways; insulators specified with silicon rubber sheds for high pollution levels (IEC 61024).
- **Standards followed:** IEEE-605 (substation grounding), IEC-60826 (loading), IEC-60273 (insulators), and ACI-318 for concrete foundations.