

Measures to support Ukraine: Sweden



To withstand Russian attacks on the energy system and to avoid a humanitarian catastrophe, we need to maintain Ukraine's ability to counter attacks. We need to provide equipment for quick system repair and maintenance

For this Ukraine's high-voltage system requires complete list in Annex 1)*:

- Autotransformers
- Circuit breakers and disconnectors
- Joints
- Other high-voltage equipment

Potential sources:

- Newly produced already
- Produced but not installed
- Used / on conservation
- Uninstalled and decommissioned

POTENTIAL SUPPLIERS

Generation, TSO & DSO

Svenska Kraftnät
Luossavaara-Kiirunavaara Aktiebolag (LKAB)
Vattenfall
E.ON Sverige AB
Ellevio AB
Eskilstuna Energy and Environment (EEM)
Mälarenergi AB
Skellefteå Kraft
Umeå Energi

Suppliers

Hitachi Energy Sweden AB

Contact details:

donoraid@ua.energy

Contact person:

Oleg Pavlenko
+380955338345

Annex 1

Complete list
of urgent needs

TSO

DSO

Generation

Equipment	Description
Autotransformers	333 000 kVA, rated voltage HV/MV/LV 750/330/15,75 kV
	250 000 kVA, rated voltage HV/MV/LV 330/150/35 (10) kV, rated voltage HV/MV/LV 330/220/35 kV
	200 000 kVA, rated voltage HV/MV/LV 330/110/35(10) kV
	125 000 kVA, rated voltage HV/MV/LV 330/110/35(10) kV
	200 000 kVA, rated voltage HV/MV/LV 220/110/10 kV
	125 000 kVA, rated voltage HV/MV/LV 220/110/35 (10, 6)kV
Transformer	20 000 kVA, rated voltage HV/MV/LV 110/35/6 kV
Circuit breakers	750 kV /4000A/40 kA
	330 kV/3150A/40 kA
	220 kV/3150A/40 kA
	150 kV/3150A/40 kA
	110 kV/3150A/40 kA
	35 kV/2000A/40 kA
Disconnectors	750-330kV/3150A
	220-150-110-35 kV/2000A
	150 kV/ 2000A
Current transformers	750 kV, transformation ratio - 3000/1, accuracy class - 0,2S/0,2S/10P/10P/10P
	330 kV, transformation ratio - 2000/1, 2000/5, accuracy class - 0,2S/0,2S/10P/10P/10P
	220 kV, transformation ratio - 1200/1, 600/5, 600-1200/5, accuracy class - 0,5/10P/10P/10P
	150 kV, transformation ratio - 1200/5, accuracy class - 0,5/10P/10P/10P
	110 kV, transformation ratio - 750-1500/1, 1500/5, 600-1000/5, accuracy class - 0,5/10P/10P/10P
	35 kV, transformation ratio - 1500/5, accuracy class - 0,5/10P/10P/10P
Voltage transformers	rated voltage - 330, 220, 110, 35 kV
Surge arrestors	750 kV, SA rated voltage - 612 kV, line grade class as per IEC - 3
	330 kV, SA rated voltage - 288 kV, line grade class as per IEC - 2
	220 kV, SA rated voltage - 192 kV, line grade class as per IEC - 2
	150 kV, SA rated voltage - 138 kV, line grade class as per IEC - 3
	110 kV, SA rated voltage - 108 kV, line grade class as per IEC - 2
	35 kV, SA rated voltage - 37,5 kV, line grade class as per IEC - 2
Relay protection and emergency automatics	Relay protection devices for 110-750 kV primary equipment

Equipment	Description
Mobile Substation	Mobile substation 154 (110) kV (40 kVA transformer + set of switchgear 110, 35, 10, 6 kV)
Complete secondary substation	Complete secondary substation (2x630 kVA) with transformers
Transformers	Power transformer 63 MVA 150/35/10 kV
	Power transformer 40 MVA 150/35/10 kV
	Power transformer 80 MVA 110/35/10 kV
	Power transformer 63 MVA 110/35/10 kV
	Power transformer 40 MVA 110/35/10 kV
	Power transformer 40 MVA 110/10/10 kV
	Power transformer 25 MVA 110/35/10 kV
	Power transformer 25 MVA 110/10/10 kV
	Power transformer 16 MVA 110/35/10 kV
	Power transformer 10 MVA 110/35/10 kV
	Power transformer 16 MVA 35/10 kV
	Power transformer 10 MVA 35/10 kV
	Power transformer 6,3 MVA 35/10 kV
	Power transformer 4 MVA 35/10 kV
	Joints
Power Cable Termination (POLT 24) 1x120 - 1x800 mm	
Other positions	Circuit breaker 110 kV, SF6
	Circuit breaker 35 kV, vacuum 35-20-1600
	Conical reinforced concrete pole for OHL (22m)
	Power Cable 6-10 kV with XLPE Isolation 1x120 - 1x800 mm
	Steel-aluminum wire 120-400 mm ²

Equipment	Description	
Transformers	Three-phase autotransformer 240000/330/220, or similar (Rated voltage of windings, HV - 330 kV, MV -220 kV, LV - 38.5kV, Rated power: 240 MVA, Frequency, Hz: 50, with forced circulation of oil and air, lightning-proof, outdoor)	
	Single phase autotransformer 210000/400/330-73, or similar (Rated voltage of windings, HV - 400 kV, MV - 330 kV, LV - 35 kV, Rated power: 240 MVA. Frequency, Hz: 50, with forced circulation of oil and air and on-load tap-changer)	
	Single phase autotransformer 133000/400/220, or similar (Rated voltage of windings, HV - 400 kV, MV - 220 kV, LV - 35 kV, Rated power: 133 MVA. Frequency, Hz: 50, with forced circulation of oil and air, lightning-proof)	
	Current transformer 2000/1, U=330 kV, accuracy class 0.2S, IEC 61869	
	Current transformer 1200/1, U=220 kV, accuracy class 0.2S, IEC 61869	
	Current transformer 1200/5, U=154 kV, accuracy class 0.2S, IEC 61869	
	Current transformer 1200/5, U=110 kV, accuracy class 0.2S, IEC 61869	
	Voltage transformer U1=400/√3 kV, U2=100/√3 V, accuracy class 0,2, IEC 61869	
	Voltage transformer U1=330/√3 kV, U2=100/√3 V, accuracy class 0,2, IEC 61869	
	Voltage transformer U1=220/√3 kV, U2=100/√3 V, accuracy class 0,2, IEC 61869	
	Voltage transformer U1=150/√3 kV, U2=100/√3 V, accuracy class 0,2, IEC 61869	
	Voltage transformer U1=110/√3 kV, U2=100/√3 V, accuracy class 0,2, IEC 61869	
	Circuit breakers and disconnectors	SF6 LTB 420E2/330kV/4000/40kA
		SF6 HPL245B1/220kV/4000/50kA
		SF6 LTB 170D1/154kV/3150/40kA
SF6 HPL145B1/110kV/4000A/40kA		
4000 A - 160 kA peak - 63 kA/3sec (various voltage class) 3150 A - 125 kA peak - 50 kA/3sec.		
Other positions	Bushings for AT (RIP bushings with silicone composite insulator): 400 kV	
	Bushings for AT (RIP bushings with silicone composite insulator): 245 kV	
	Transformer Oil (T-1500 or similar oil)	
	Power cable XLPE insulation – 330 kV 1x630/95	
	Cable bushing Pfisterer ESS420-C166	

* We ready to consider equipment that is not fully consistent (in part of technical specifications) with our list of needs
** Also, we are ready to consider the equipment with broader range of technical parameters

Annex 2

Contact list

1	Svenska Kraftnät	Mr. Bo Netz, Chairman of the Board registrator@svk.se ; +46 10-475 80 00
2	Luossavaara-Kiirunavaara Aktiebolag (LKAB)	Jan Mostrom, CEO info@lkab.com ; 0771-760 000
3	Vattenfall	Anna Borg, President and CEO +46 8 739 50 00,
4	E.ON Sverige AB	+46 (0)40-255000
5	Ellevio AB	Johan Lindehag, CEO +46 8-606 00 00 info@ellevio.se
6	Eskilstuna Energy and Environment (EEM)	kundservice@eem.se ; +46-1610-6060
7	Mälarenergi AB	post@malarenergi.se ; 021 39 50 50
8	Skellefteå Kraft	Joachim Nordin, CEO
9	Umeå Energi	Jan Ridfeldt , CEO umea.energi@umeaenergi.se ; 090-16 00 20
10	Hitachi Energy Sweden AB	Tobias Hansson, CEO +46 (0)21-325000, contact.center@se.abb.com ;