Appendix 1

TECHNICAL SPESIFICATION

Information on necessary technical, quality and quantity characteristics

In the event that these Technical Requirements contain references to standard characteristics, technical regulations and conditions, requirements, conventional designations and terminology related to the purchased goods, stipulated by existing international, European standards, other joint technical European norms, other technical reference systems recognized by European standardization bodies or national standards, norms and regulations, references to the source of origin or manufacturer, etc., then it is considered that the Technical Requirements contain the expression "or equivalent"

Justification: The customer could have applied the use of the names of individual manufacturers in order to simplify the process of preparing tender offers and give the participants an understanding of which products fully satisfy the needs of the enterprise.

У разі, якщо дані Технічні вимоги містять посилання на ДСУТ/ГОСТ/ТУ, якість продукції, запропонована учасниками, має бути не гірша ніж в зазначеному ДСТУ/ГОСТ/ТУ

If these Technical Requirements contain a reference to DSUT/GOST/TU, the quality of the products proposed by the participants must not be worse than in the specified DSTU/GOST/TU

I. Інформація про кількісні та якісні характеристики предмета закупівлі:

I. Information on quantitative and qualitative characteristics of the subject of purchase:

No.	Найменування товару/ Name	Одиниця виміру/ UoM	Кількість / Quantity	Опис, технічні характеристики та інша інформація/ Technical characteristics			
				No.	Опис/ Parameters	Одиниці/ UoM	Значення та зміст/ Description
1	**Дизельна транспортабельна котельня 1,8 МВт**	**Set**	**8**	I			
					Теплова потужність (номінальне навантаження не менше)/ Thermal power (nominal load not less)	МВт/ MW	1.8
					Температурний графік / Temperature regime	°C	80-60
					Котел/ Boiler:		Автоматизований водогрійний котел працюючий на рідкому паливі. Встановлена потужність – 1,8 МВт/ Automated water heating boiler operating on liquid fuel. The installed capacity is 1.8 MW
					Котел виконаний у зварному газощільному виконанні. Матеріал корпусу нержавіюча сталь, можливість автоматичного запуску при температурі зовнішнього повітря -22/ The boiler is made in a welded gas-tight version. The material of the body is stainless steel, the possibility of automatic start-up at an outside air temperature of -22.	Шт./ EA	1
					The frame of the module with roller shutters and service platforms on the wheelbase (at least two axles). The trailer must comply with standard DSTU 3850-99 "Road vehicles. Specialized trailers and semi-trailers." The type of towing coupler must meet the requirements of DSTU 3649:2010, the manufacturer's requirements for tightening and availability of all fasteners, providing intended functions of coupling devices and the wear degree of the working surfaces of load-bearing elements and friction couples - height to be agreed with Enabel. The maximum static axial load on the trailer undercarriage wheels must not exceed: - for single-axle carriages - 10 t. - for two-axle carriages - 16 t. - for three-axle carriages - 22 t. Dimensions must not exceed: - width - 2 600 mm - height, taking into account the height of the diesel boiler of 1.8 MW output, above the road surface — 3 700 mm - length (for tractor-trailer units) - 22 000 mm	EA	1

					The set of drawings (schematic diagrams) of the trailer shall be agreed with Enabel.		
					Chimney with a clamp-attached removable section, as a part of the module. Height not above 3.7 m above the road surface level. Emissions shall not exceed the ones specified in EU directive 2015/2193	EA	1
					Full service life of the boiler specified for average boiler running time at nominal capacity of 3000 hrs/year, not less than	years	20
					Average time to failure, not less than	hours	3000
					Service life between major repairs, not less than	years	5
					"Gross" efficiency of the boiler at the calculated outdoor temperature of 0°C, not less than To be determined by the reverse balance according to GKD 34.09.103-96 "Calculation of reporting technical and economic indicators of power plants on the thermal efficiency of equipment"	%	93
					Equivalent noise level in the service area, not above	dB	80
					Temperature on the insulation surface during boiler operation at an ambient temperature of 25°C	°C	45
					Automated fire alarm and extinguishing system.	Set	1
					Power supply system	EA	1
					- for Motors: 380V, 50Hz AC; all supplied equipment must be resistant to short-circuit currents; - provide for the possibility of powering "remote" equipment from the module; From a stationary outlet or via transfer switch from an industrial 3-phase diesel generator not under 44 kVA with automatic start, 12V battery, float fuel tank overflow relay with discrete output, 1500 rpm. 5-core power cable with a cross-section not under 6 mm^2 5th class of flexibility, temperature -30 +60, 10 meters long - 2 pcs. with 50A crimp terminals at the ends. Power supply voltage of electrical equipment of the trailer - 24 V.		
					Circulation pump complete with electric motor and frequency converter	set	**1**
					Determine the pressure and flow characteristics of the pump by calculation.		* - the pump parameters must be sufficient to ensure the operating parameters of the boiler circuit and provide regulation in the boiler output range of 30-100%
					Boiler control and monitoring system complete with EC&I	EA	1
				II	**Burner:**		
					The burner is designed for burning liquid fuel (mechanical nozzle) complete with blast fan; smooth adjustment	EA	1
				III	**Connection pattern:** independent	-	
					Heat exchanger(s) set(s). with capacity not under 1.8 MW	set	The quantity and capacity shall be determined by calculation taking into account the requirements for overall dimensions
					Network pump complete with electric motor and frequency converter. Determine the pressure and flow characteristics of the pump by calculation.	set	3
				IV	**Heat media of the main heat circuit**	-	
					propylene glycol (with hygienic certificate) for temperature -30 ºC	$м^3$	The quantity must ensure 100% filling of the boiler system
				V	**Connection to the consumer circuit**		
					Hoses included. Hoses (supply and return) DN 65, 10 m long - 2 pcs. complete with bolts, nuts, and gaskets. Heated hose DN 25, 10m - 1 pc.	Set	3
				VI	**Scheme of refilling the consumer's heat supply system** The refilling unit must be the part of the module (on-board). The module must be equipped with a separate pipeline that can be connected to the municipal water supply system and equipped with a flow meter. Pump with a pressure of at least 3 bar, flow rate not under 1.5 m^3	set	1

				VII	Indoor and outdoor lighting of the module and a portable battery-powered lamp	Set	1
				VIII	Manual pump for pumping diesel fuel, complete with hoses	EA	1
				IX	**Boiler platform (excluding standardized trailer coupling):** dimensions not above 7.5x2.6 m (taking into account the dimensions on approach ramps), and height not above 3.7 m from the road surface level.	EA	1
				X	**Communication device**	comp.	1
					VHF gateway to the control room with 10 m cable and antenna	EA	3
2	**Transportable cistern of diesel fuel (transported empty) 6 m³.**	**set**	**2**	X1	The full set includes: Cylindrical tank 6 m³ Stairs with a platform and railings for hatch maintenance Set of process equipment for the hatch: - Breathing line DN 50 with valve DC-50 (ДК-50) - Measuring line DN 50 with coupling CAM-LOCK DC 2 - Drain line DN 80 with fire fuse OP-80 (ОП-80) and coupling CAM-LOCK DC 3 Filling pump with output of 60 l/min. for diesel fuel Delivery line equipped with a back-flow valve, OP-50 (ОП-50) fire barrier and a KSh-25 (КШ-25) ball valve Filter separator Fuel pump, fuel hose. The capacity is graded with a meter rod. Fire extinguisher Frame of a transportable tank with service platforms on a wheelbase (at least two axles). "Earring" coupling; also provide a locking device for the loop "NATO" (for the earring coupling). Coordinate the height with Enabel. Anticorrosive protection of surfaces (external and internal) and all elements and structures according to the requirements: DSTU 4454:2005; DSTU B V.2.6-193:2013 (ДСТУ 4454:2005; ДСТУ Б В.2.6-193:2013). Power supply voltage of electrical equipment of the trailer - 24 V. The set of drawings (schematic diagrams) of the trailer shall be agreed with Enabel	set	2
3	Spare parts kit	set	1	XII	Recharge pump	EA	1
					Boiler circuit circulation pump	EA	1
					Main circuit circulation pump	EA	1
					Fuel pump	EA	1
					Heat exchanger	EA	1
					Burner nozzles	EA	1
					Burner fuel filter	EA	1
					Generator fuel filter	EA	1
					Generator lubrication, not less than	L	18
					Hoses (supply and return) DN 65, 10m long - 2 pcs. Heated hose DN 25, 10m - 1 pc.	Set	1
					Automation system and EC&I	Set	1
					Shut-off valves DN65 - 1 pc. DN 25 - 1 pc. DN 20 - 1 pc. DN 15 - 1 pc. Filter DN 150 - 1 pc.	Set	1
					propylene glycol (with hygienic certificate) for temperature -30 °C	м³	3.0
					5-core power cable with cross-section not under 6 mm2 of the 5th flexibility class; temperature -30 +60; 25 meters long - 1 pc.	EA	1
					Automated fire alarm and extinguishing system.	Set	1

* * The Boiler control and monitoring system must provide:

- dispatching and control via LTE and VHF.

- VHF dispatching in emergency mode in the absence of external power supply and cellular network must ensure operation for 30 days.

- access to the dispatching system (both via LTE and VHF) from the control point through the WEB interface.

- transfer of all the measured pressures and temperatures to the controller (thermometers and pressure gauges shall duplicate the indicators).

- when operator presses the “WARM-UP” button, the module shall automatically start circulation in the boiler circuit, start the boiler burners (start and finish the warm-up). Meanwhile, the operator shall not perform any manipulations inside the module.

- after connecting consumer's heating system to the module, when operator presses the “START” button, the module must automatically fill the flexible hoses and consumer's circuit (connection valves shall be closed). Once full, the module must automatically warm up the consumer's circuit through a throttling washer between the supply and return pipelines.

- Measurement of internal tank fuel level, emergency minimum level, emergency maximum level (duplicated).

- Automated refueling of the generator fuel tank by sending appropriate fuel pump signals to the external fuel tank.

- Commercial metering of released heat energy.

The automation system must be equipped with a GPS module and remote data transmission device, from which the boiler coordinates are transmitted via VHF/GSM/LoRaWAN standard wireless network. Support for all these standards is required to select the data transmission standard with a reliable coverage area at the location of the diesel transportable boiler.

Data must be transmitted through the data processing server, which is provided by the corresponding wireless operator to the existing PC of the control point of the respective RT (translator's note: PT - unknown abbreviation in Ukrainian, presumably denoting the separate boiler unit). This data shall be presented via the WEB interface on the map of city.

For GSM technology, this server must have the function of a network server and provide connection of the existing PC of the control point of the respective RT via the GRE tunnel and APN. For VHF/LoRaWAN technology, in addition to the network server function, this server must have the application server function and decrypt information packets if they get distorted during narrow-band transmission typical of this standard.

The remote data transmission device must support "transparent" mode (by emulating the serial port in TCP or UDP client mode) to ensure the possibility of interrogating with the software at the control point.

The automation system must be equipped with a GPS module, from which the boiler coordinates are transmitted to the existing PC of the control point of the respective RT (translator's note: PT - unknown abbreviation in Ukrainian, presumably denoting the separate boiler unit). This data shall be presented via the WEB interface on the map of city.

The automation system shall be able to automatically select pre-configured parameters depending on GPS coordinates.

The module must be equipped with a video surveillance camera for the fuel tank with video recording function and video storage device. The archive capacity must be designed to store recordings for 72 hours.

A separate remote chamber shall be provided for the fuel tank.

All materials and equipment must be new, and their brands must meet the operating conditions specidied for the boiler plant, in compliance with the NPAOP 0.00-1.81-18 (НПАОП 0.00-1.81-18).

1. LIST OF SUPPORTING DOCUMENTS TO BE PROVIDED AS PART OF THE TENDER PROPOSAL:

1.1 Technical proposal in the form of Appendix 3 to the Tender Documentation.

1.2 Passport or operational documentation of the module in Ukrainian (item I);

1.3 Passport or instruction for auxiliary equipment (paragraphs II-III);

1.4 Valid permission of the equipment manufacturer to perform high-risk work: installation, dismantling, adjustment, repair, maintenance, reconstruction of high-risk machines, mechanisms, and equipment. Steam and hot water boilers with a heating capacity above 0.1 MW (steam boilers with a steam capacity up to 100 t/hr with operating steam pressure up to 3.9 MPA and steam temperature up to 350 ºC; hot water boilers with a heating capacity up to 100 GCal/hr with operating pressure up to 3.9 MPA and water heating temperature up to 250 ºC); vessels operating at pressures above 0.05 MPA (vessels operating at pressures up to 4.0 MPA)

1.5 Permit for technical inspection, testing, expert examination, technical diagnostics of machines, mechanisms, and equipment of increased safety issued by the State Labor Service to the manufacturer of the equipment operating under pressure, which is specified in the Technical Regulations of equipment operating under pressure, approved by the resolution of the Cabinet of Ministers of Ukraine dd 16.01.2019 No.27.

1.6 A letter in any format confirming that the permit to operate a transportable boiler plant has been obtained from the State Labour Service of Ukraine.

1.7 License from the equipment manufacturer for installation of fire alarm and fire extinguishing systems (water, foam, gas, powder, aerosol) at sites with a high, medium, and low degree of fire safety risk.

1.8 A copy of the current technical specifications (ТУ) or another regulatory document (title page) for the equipment being the subject of purchase.

1.9 Information about the availability of the equipment and the material and technical base:

1.9.1 5-ton cargo truck;

1.9.2 3.5-ton cargo truck;

1.9.3 Sheet bending machine;

1.9.4 Shearing press;

1.9.5 Milling machine;

1.9.6 Lathe machine;

1.9.7 Metal plasma cutting machine;

1.9.8 High-pressure device;

1.9.9 Availability of a production hall with area of at least 150 m^2;

1.9.10 Availability of an installation site with area of at least 100 m^2;

1.9.11 In the case of rented equipment or premises, please provide valid lease agreements;

1.10 Certificate of conformity of the product manufacturer for transportable boiler installations.

1.11 For non-manufacturers of goods: a contract with the manufacturer and/or a certificate of distributor, representative, dealer and/or a letter of authorization from the manufacturer and/or other similar document confirming the legal relationship between the manufacturer and the participant.

1.12 A letter confirming the possibility of warranty service for the purchased item in Ukraine, indicating the addresses of service centers (at least 2).

2. Year of manufacture of the module: not earlier than 2023.

3. The warranty period for the equipment must be specified in the manufacturer's passport, but in any case shall not be under 36 months from the date of the equipment delivery and 24 months from the date of its first start-up. The day of signing the Act of the Admissions Committee on the acceptance of the object into operation shall be deemed to be the beginning of the warranty period.

4. Documents that shall be provided within 3 weeks upon the conclusion of the Agreement:

Drawings of tasks for attaching all the supplied equipment.

5.1 Technological diagrams of pipelines, including connection dimensions, thermal displacements, and permissible loads at points.

5.2 List of safety and control valves and pipeline specifications.

5.3 Instrument list, instrument data, and materials specification for the control system.

5.4 Electrical component diagrams and connection diagrams of automatic burner control panels, with terminal boxes of thermocouples, igniters, scanning devices, etc.

5.5 The supply points of resources, i.e., the heat carrier and electricity (with a list of electrical equipment) shall be specified, including the corresponding consumption figures and indicating the necessary temperature and pressure modes."

6. Documents that shall be provided with the products:

6.1 Declaration of conformity of the module with the requirements:

- Technical regulations of the equipment operating under pressure approved by resolution of the Cabinet of Ministers of Ukraine No. 27 dd January 16, 2019;
- Technical regulations of low-voltage electrical equipment approved by resolution of the Cabinet of Ministers of Ukraine No. 1067 dd December 16, 2015;

6.2 Factory test reports.

6.3 Instructions for the equipment acceptance by the Buyer on the site and processing claims and compensations.

6.4 Certificates of conformity according to the technical regulations of equipment operating under pressure approved by resolution of the Cabinet of Ministers of Ukraine No. 27 dd January 16, 2019 for the boiler and all relevant equipment that it is equipped with.

6.5 Passports for the boiler and equipment supplied with the transportable boiler plant from the manufacturers.

The passport must be accompanied by a guidance (instruction) for installation, start-up, adjustment, and operation, containing requirements for the restoration and control of metal during installation and operation over the estimated service life, including the instruction for cleaning the boiler heating surfaces.

Manufacturers (their authorized representatives) or suppliers (importers) of pressure equipment or their components of overseas production must provide them with operational documents (passports, installation and operation instructions), nameplates, and markings in the Ukrainian language.

The technical documentation must include:

• Storage and loading/unloading methods.

• Assembly and installation instructions with drawings.

• A complete set of instructions and drawings for operation, maintenance, and repair, including a list of quick-wear parts that can be replaced on-site.

• Equipment performance characteristics.

• Calculation of boiler strength.

7. Delivery volume

Delivery of a single module shall include, without limitations, the following:

1. Boiler with embedded thermal insulation.
2. Burner with fan.
3. Control systems.
4. Safety means.
5. Network pump(s) complete with electric motor with frequency converter.
6. Circulation pump complete with electric motor with frequency converter.
7. Strapping fittings.
8. Heat exchanger(s).
9. Automation and dispatching system.
10. Flexible hoses.
11. Power supply system with diesel generator.
12. Automated fire alarm and extinguishing system.
13. Transportable diesel fuel tank 6 m^3 2 pcs. with a set of pipes interconnecting the tanks.
14. The delivery package must include the necessary set of tools for installation, connection/disconnection, maintenance, and repair.
15. Documentation:

Passports from manufacturing plants, certificates of conformity according to the technical regulations of equipment operating under pressure for all equipment comprised by the module. The passport and operational documentation of the module must be drawn up in the official Ukrainian language.

The passport must be accompanied by a guidance (instruction) for installation, start-up, adjustment, and operation, containing requirements for the restoration and control of metal during installation and operation over the estimated service life, including the instruction for cleaning the module heating surfaces and the technical file.

Manufacturers (their authorized representatives) or suppliers (importers) of pressure equipment or their components of overseas production must provide them with operational documents (passports, installation and operation instructions), nameplates, and markings in the Ukrainian language and the technical file.

All equipment, its components, or parts shall be supplied filled with working fluids, pre-installed, and ready for operation.

16. Appropriately formalised and approved:

- calculations for the selection of equipment;
- data on the volume of the internal boiler system with specified amount of propylene glycol.

17. The supplier must register the trailer for moving the technical module and trailers of transportable diesel fuel tanks 6m^3 (2 pcs.) with the bodies of the Ministry of Internal Affairs for the Buyer, obtaining the state license plates and technical passports. The documents required to registrer the trailers with regional service centers of the Ministry of Internal Affairs must comply with the requirements of Resolution No. 873 of the Cabinet of Ministers of Ukraine dd 21 October, 1993.

18. After completing the delivery, the supplier shall obtain the permission to operate the transportable boiler plant from State Labour Service of Ukraine.

19. The supplier undertakes to conduct an initial technical inspection of the boilers, making the respective entry in the boiler passport.

20. The supplier undertakes to carry out staff training.

21. The dispatcher software shall be included in the delivery package comprised by the general delivery package.

8. Requirements for the module structure

The equipment (automatic safety of boiler equipment) shall be secured according to the requirements of: Section 17-DBN V 2.5-77:2014 (17 - ДБН В 2.5-77:2014); paragraph 4 of Section VII - NPAOP 0.00-1.81-18 (НПАОП 0.00-1.81-18); paragraph 3.26 of Section V of the NPAOP 0.00-1.76-15 (НПАОП 0.00-1.76-15); paragraphs 9.69 – 9.72 DBN V. 2.5-20:2018 (ДБН В.2.5-20:2018); paragraph 6.1.14 - PTETUiM (ПТЕТУіМ).

9. Warranties

The service life of the equipment included in the delivery package must be not less than 20 years.

The warranty period for the equipment must be specified in the manufacturer's passport, but in any case shall not be under 36 months from the date of the equipment delivery and 24 months from the date of its first start-up. The day of signing the Act of the Admissions Committee on the acceptance of the object into operation shall be deemed to be the beginning of the warranty period.

10. Transportation and packaging

All heating surfaces and pipelines must be internally cleaned of all possible foreign impurities before shipment from the factory.

The surfaces of all machine-treated equipment must be protected from corrosion during transportation, storage, and installation by applying one (1) layer of corrosion-resistant coating, as well as the outer edges of valves and pipelines intended for welding.

All elements of the module, including auxiliary equipment, must be sent to the consumer in preserved form in appropriate packaging, which ensures the safety of the equipment during loading, unloading, transportation, and storage throughout the warranty period.

All parts must be protected from dirt, rust, and other possible damage toof external and internal surfaces during shipment, transportation, and outdoor storage prior to installation of the equipment. The measures used to protect the equipment must be in accordance with the factory instructions.

All delivered nodes shall be listed.

The module must contain a nameplate with the marking of passport data applied in a shock or other equivalent way, which ensures the clarity and durability of the image and comprises the following information:

a) name and trademark of the manufacturer;

b) module marking;

c) number according to the manufacturer's numbering system;

d) year of production;

e) installed capacity, in MWh;

f) operating pressure at the outlet in MPa (KgF/cm2);

g) nominal outlet temperature in °C;

k) specified technical conditions;

l) climatic version.

The body is marked with a strapping scheme, center of gravity, and weight.

All supplied equipment shall have nameplates with the manufacturer's name, model number, and serial number.

Factory test reports with certificates for pressure parts shall be prepared. Certification test reports shall be kept at the manufacturing plant so that they can be verified by the Buyer.

The buyer shall have the right to attend the factory tests. The supplier shall notify the buyer of the test date at least 15 calendar days in advance.