

### Annex 1.3: Schedule of requirement – LOT 3

#### LOT3 DISTRIBUTION: RS 485 (serial interface)

<b>LOT 3:</b>	<b>Total</b>
<b>DISTRIBUTION: RS 485 (serial Interface)</b>	<b>1 phase</b>
<b>Total Meters</b>	<b>522</b>

#### Smart Meters

REQUIRED SPECIFICATIONS	
Specifications	Smart meters, single-phase
Accuracy class: for Active Energy for Reactive Energy	B 2
Reference current	min. 5 A
Maximum current, Iref	min. 60 A
Minimum current	0.05 Iref for active / 0.05 Iref for reactive
Reference voltage, Un	230 V
Reference frequency	50 Hz (± 2 %)
Inherent consumption (EN 50470-3 , IEC 62053/21-22-23, IEC 62053-61, without communications overhead) of current circuit, not more than of voltage circuit, not more than	1 VA 2 W / 10 VA
Inherent consumption of voltage circuit (IEC 62052-11, IEC 62053/21-22-23, IEC 62053-61, including communication overhead), not more than	5 W / 10 VA
Internal clock accuracy (IEC 62052-21)	≤ 0.5 s / 24 h
Insulation strength (IEC 61010-1-90)	4 kV, 50 Hz, 1 min
Shock voltage (IEC 60060-1)	6 kV, 1.2/50 µs
Electrostatic discharge (IEC 61000-4-2)	15 kV
High frequency radiant field (IEC 61000-4-3)	≥ 30 V/m
High frequency interferences (IEC 6100-4-4)	4 kV
Surge immunity test (IEC 6100-4-5)	6 kV

IP rating	IP54
Mechanical class	min. M1
MTL (Mean Total Lifetime)	not less 15 years
MTBF (Mean Time Before Fail)	less than / year 0.5%
<b>CERTIFICATES</b>	<b>REQUIRED SPECIFICATIONS</b>
Specifications	<b>Smart meters, single-phase</b>
MID certificate	Should be issued by European recognized lab
Production certificate	According to MID (mode D)
ISO	9001
<b>FUNCTIONAL SPECIFICATIONS - METERING PARAMETERS</b>	<b>REQUIRED SPECIFICATIONS</b>
Specifications	<b>Smart meters, single-phase</b>
METERING DATA	<ul style="list-style-type: none"> <li>- Actual meter readings;</li> <li>- Periodic (billing) meter readings: Day, month;</li> <li>- Interval meter readings: 15', 30', 60'; day</li> <li>- Timestamp.</li> </ul>
MULTI-RATE METERING	<ul style="list-style-type: none"> <li>- Up to 4 tariff registers, flexible adjustment of tariff intervals;</li> <li>- Min. 4 changeovers per day;</li> <li>- Tariff indicator is displayed on LCD and transmitted to an external system;</li> <li>- Active and passive tariff plans, configurable activation time of the passive tariff plan.</li> </ul>
MEASURED VALUES	<ul style="list-style-type: none"> <li>- Active energy, class B, export/import;</li> <li>- Reactive energy, class 2, 4 quadrants;</li> <li>- Apparent energy;</li> <li>- Active/reactive power, apparent power;</li> <li>- Phase voltage/current, instantaneous value (True RMS, integration period 1 s);</li> <li>- Voltage angle values relative to the voltage in first phase and phase currents relative to relevant phase voltages.</li> </ul>
METERING CALENDAR	<ul style="list-style-type: none"> <li>- Up to 4 seasons per year;</li> <li>- Up to 7 daily profiles per week;</li> <li>- Up to 30 special days per year;</li> <li>- Support of movable holidays.</li> </ul>
DATA STORAGE	<ul style="list-style-type: none"> <li>- Non-volatile memory;</li> <li>- Not less than 3 interval profiles and 1 billing profile.</li> <li>- Storage capacity:</li> <li>- 15 minutes interval profile: not less than 45 days for 6 parameters</li> <li>- Asynchronous profile (spontaneous events), last entries data.</li> </ul>
OPERATING MODES	<ul style="list-style-type: none"> <li>- Normal mode;</li> <li>- Energy saving mode - real time clock, opening sensors, and data displaying are active.</li> </ul>
POWER QUALITY CONTROL	<ul style="list-style-type: none"> <li>- Quality indexes: <ul style="list-style-type: none"> <li>✓ average voltage;</li> <li>✓ voltage sags and swells;</li> <li>✓ outages;</li> <li>✓ network frequency;</li> <li>✓ THD for voltage/current harmonics;</li> </ul> </li> <li>- Remote or local configuring of parameters thresholds and control actions.</li> </ul>
<b>FUNCTIONAL SPECIFICATIONS - MANAGEMENT AND CONTROL PARAMETERS</b>	<b>REQUIRED SPECIFICATIONS</b>
Specifications	<b>Smart meters, single-phase</b>

DLMS/COSEM SUPPORT	<ul style="list-style-type: none"> <li>- IEC 62056 compliant;</li> <li>- Object Identification System compliant;</li> <li>- Standard data models;</li> <li>- Standard communications protocols.</li> </ul>
DATA TRANSMISSION	<ul style="list-style-type: none"> <li>- On demand;</li> <li>- By Schedule;</li> <li>- Remote HES request;</li> <li>- Local request (via optical port).</li> <li>- Internal interface for transformer connected meters (which is an integrated part of the data concentrator)</li> </ul>
SOFTWARE UPGRADE	<ul style="list-style-type: none"> <li>- Remote (via communication channel);</li> <li>- Local (via RS-485 or optical port)</li> </ul>
FRAUD AND THEFT PROTECTION	<ul style="list-style-type: none"> <li>- Non-stop monitoring, including sleep mode time;</li> <li>- Meter cover opening sensor;</li> <li>- Terminal block cover sensor;</li> <li>- Reverse meter connection control;</li> <li>- Strong magnetic field detection;</li> <li>- Events registering in relevant logs;</li> </ul>
BUILT IN CLOCK	<ul style="list-style-type: none"> <li>- Real-time clock with 0.5 s accuracy per day;</li> <li>- IEC 62052-21 standard compliant;</li> <li>- External synchronization with HES</li> </ul>
EVENTS AND ALARMS HANDLING	<ul style="list-style-type: none"> <li>- Continuous control of current state of meter functional nodes and alarms/events;</li> <li>- Standard set of events processing including: registration in special logs and registers, event report sending, states displaying;</li> <li>- Different types of event logs;</li> <li>- Asynchronous sending of Event;</li> <li>- Notification can be configured for specific events.</li> </ul>
METER SELF CONTROL	<ul style="list-style-type: none"> <li>- Built-in test for continuous self-control;</li> <li>- Quick response on severe error</li> </ul>
POWER LOAD CONTROL	<ul style="list-style-type: none"> <li>- Basic relay (80 A) – for direct connected meters only</li> <li>- Control modes: <ul style="list-style-type: none"> <li>✓ remote (by command)</li> <li>✓ local (by condition)</li> <li>✓ manual - by push button</li> </ul> </li> <li>- Basic relay status displayed on the meter LCD</li> </ul>
METER PARAMETRIZATION	<ul style="list-style-type: none"> <li>- Remote (via communication channel) or local (via optical port);</li> <li>- Access rights assignment from HES;</li> </ul>
THRESHOLDS MANAGEMENT	<ul style="list-style-type: none"> <li>- Threshold for active power, active power demand, current/voltage (per phase), differential current (direct connected meters only);</li> <li>- Remote or local configuring of parameters thresholds;</li> <li>- Possibility to disconnect consumer from the network, when a threshold is crossed.</li> </ul>
BACK-UP POWER SUPPLY	<ul style="list-style-type: none"> <li>- Supports clock/meter operation when the power is off;</li> <li>- Battery, lifetime - not less than 10 years.</li> </ul>
<b>FUNCTIONAL SPECIFICATIONS - SECURITY</b>	<b>REQUIRED SPECIFICATIONS</b>
Specifications	<b>Smart meters, single-phase</b>
INFORMATION SECURITY	<ul style="list-style-type: none"> <li>- Communication encryption (AES-GCM-128 security suite);</li> <li>- Data access according to access rights stated;</li> <li>- Firmware protection.</li> </ul>
<b>FUNCTIONAL SPECIFICATIONS - INTERFACES</b>	<b>REQUIRED SPECIFICATIONS</b>

Specifications	<b>Smart meters, single-phase</b>
OPTICAL PORT	<ul style="list-style-type: none"> <li>- IEC 62056-21 Compliant;</li> <li>- Data rates - up to 19200 bps;</li> <li>- Password protected;</li> <li>- Multiple access levels.</li> </ul>
BUILT-IN DISPLAY	<ul style="list-style-type: none"> <li>- LCD with min 8 lines;</li> <li>- Configurable decimal places (up to 3 digits);</li> <li>- Manual and automatic scrolling;</li> <li>- Backlight.</li> </ul>
TEST OUTPUTS	<ul style="list-style-type: none"> <li>- 2 led outputs;</li> <li>- Active and reactive energy;</li> </ul>
PUSH BUTTON	<ul style="list-style-type: none"> <li>- Scroll meter screens;</li> <li>- View data on LCD, when the power is off.</li> </ul>
RS485 SERIAL INTERFACE (optional, mandatory for Lot 3 only)	<ul style="list-style-type: none"> <li>- EIA/TIA-485A standard;</li> <li>- Baud rate - up to 38400 bps</li> </ul>
<b>FUNCTIONAL SPECIFICATIONS - REMOTE COMMUNICATION</b>	<b>REQUIRED SPECIFICATIONS</b>
Specifications	<b>Smart meters, single-phase</b>
REMOTE DISCONNECTION	<ul style="list-style-type: none"> <li>- Bi-stable switching module for local or remote disconnection/reconnection;</li> <li>- Min. 10 000 mechanical disconnections/reconnections under maximum load.</li> </ul>

<b>TECHNICAL SPECIFICATIONS - HES SOFTWARE</b>	
SOFTWARE LICENCES	<ul style="list-style-type: none"> <li>- HES software licenses will be offered for piloting, free of charge with full functionality;</li> <li>- The Bidder will provide the necessary hardware and operating system specifications for the HES software installation;</li> <li>- The HES platform must have sufficient licenses to cover the meters delivered by the Bidder; Licenses must be valid for a period of 12 months from the time of commissioning.</li> </ul>