Jasin, April 24, 2025

MB Poznań Sp. z o.o.
Gottlieba Daimlera 6
62-052 Komorniki

No/symbol: **WTE-MB-W-0004/25**

TECHNICAL CONDITIONS FOR CONNECTING THE INSTALLATION TO THE POWER NETWORK

for a recipient in connection group IV

concerns connection to the operator's electricity grid:

GLOSBE Sp. z o. o.
Jasin, Rabowicka 65
62-020 Swarzędz

Issued on the basis of an application to determine the connection conditions of MB Poznań Sp. z o.o.

Connected facility:

BESS-H5 electricity storage facility in Jasin, plot no. 303/44 Swarzędz commune

MB Poznań Sp. z o.o.

Fragment of the plot no. **303/44** precinct **0006 Jasin**, **Swarzędz** commune

with an installed power of 2.0 MW (2 MW/5.15 MWh) with a maximum charging and discharging power of 2.0 MW and batteries with a total nominal capacity of 5.15 MWh.

connected to the HALL M5 photovoltaic installation - 1.416 MWp (PPE: 590545064050005011)

total installed power 3.416 MW

total connection power 2.00 MW
in a 3-phase system on voltage 0.4 kV

1. **Connection points:**

   Current terminals in the main low-voltage switchboard located in the low-voltage switchboard of the H5 transformer station in Jasin, Jasin district, Swarzędz commune.

2. **Network connection type:** cable

3. **Scope of necessary network expansion:** no network expansion

4. **Scope of construction of the power connection:**

4.1. In the part concerning the Energy Company's equipment:

4.1.1. To power the connected facility, a transformer with a minimum capacity of 2500 kVA must be installed in the transformer station. The exact transformer parameters will be determined based on a technical analysis.

4.1.2. To power the connected facility, adapt the low-voltage cable line with a cross-section adapted to the needs determined based on calculations. This low-voltage cable line should be led from the transformer's current terminals towards the connection point specified in point 1.

4.2. In the part concerning the devices of the Connecting Entity:

4.2.1. To supply power to the generating source, adapt the low-voltage cable line. This cable line should be led from the main switch in the main low-voltage switchboard referred to in point 1 towards the connected facility.

4.2.2. Install electrical installation in the connected facility.

4.2.3. Install a device in the main 0.4 kV distribution board to ensure the technical capacity of the distribution board does not exceed the connection power specified in the connection conditions. This device should be installed in a way that allows the Glosbe Distribution System Operator (DSO) to supervise the device and prevents the customer from changing its settings without the Glosbe Distribution System operator's approval.

4.2.4. The generating source's switchboard should be equipped with the protection automation necessary for the source to cooperate with the Glosbe network. The automation should be designed in accordance with point 12 of the connection conditions.

4.2.5. Ensuring that the Facility meets the technical and operational requirements specified in regulations issued pursuant to Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity, including the requirements set out in Commission Regulation (EU) 2016/631 of 14 April 2016 establishing a network code on requirements for grid connection of generating units (NC RfG), Commission Regulation (EU) 2017/2196 of 24 November 2017 establishing a network code on electricity emergency and restoration and Commission Regulation (EU) 2017/1485 of 2 August 2017 establishing a guideline on electricity transmission system operation, as amended.

4.2.6. Ensuring compliance with the conditions and requirements established under the regulations developed under Articles 59 and 61 of Regulation 2019/943, including the requirements of general application arising from Regulation 2016/631, as amended.

4.2.7. Ensuring compliance with the conditions and requirements of implementing acts issued under the Act of 10 April 1997 - Energy Law, as amended.

4.2.8. Ensuring compliance with the conditions and requirements of the TNC and TNC, in areas not regulated in documents 4.2.5., 4.2.6. and 4.2.7.

4.2.9. Develop and agree on an operational cooperation manual, including provisions regarding

the conduct of the customer's and DSO Glosbe personnel in connection with the operation and maintenance of equipment and shutdowns, both planned and emergency, on power lines. This manual should be agreed upon with Glosbe's DSO.

4.2.10. Ensure the measurement and transmission of data measured on the low voltage side to the DSO Glosbe in accordance with the requirements of NC RfG and IRiESD (separately for each type of installation).

4.2.11. Ensure that the generating source is equipped with telemechanics and telecommunications devices, systems, and connections, along with parameterization, necessary for communication and online data transmission on the generating source's status to the Glosbe's SCADA System.

4.2.12. Required scope of signals, measurements and controls of object telemechanics (separately for each type of installation):

4.2.13. Signaling of switches on the low voltage side – two-bit,

4.2.14. Automation status:

a) Automation control mode – remote/local
b) P control mode – remote/local
c) Q control mode – includes Q, U, cosϕ parameters – remote/local

4.2.15. Signaling warnings resulting in the exclusion of fields.

4.2.16. Measurements:

a) Electrical (active power, reactive power, currents, phase-to-phase voltages, phase-to-phase voltages, cosϕ, frequency):
   - in the field outputting power to the Glosbe DSO,
   - active power set – percentage,
   - set reactive power – absolute/percentage,
b) System: transmission controller parameters,

4.2.17. Two-state control:

a) Control of the energy storage switch – OFF (after low voltage) – while maintaining the power supply for auxiliary needs,
b) Switching off/on the regulation mode: remote/local P, Q
c) Approval of control settings.

4.2.18. Analog Control:

a) Active power control,
b) Reactive power control,

4.2.19. Conditions for automatic connection of the facility to the network (must be met jointly):

a) The voltage frequency in the network is in the range from 49.00 Hz to 50.05 Hz,
b) Time delay (understood as the time between the moment when the frequency value returns to the range defined above and the moment the facility is connected to the network) – at least 60 seconds,

c) The maximum permissible gradient of increase in the generated active power is 10% of the maximum power per minute.

4.2.20. In the event of an increase in the frequency in the power system, the active power control system of the generating source should be capable of reducing the active power in accordance with the set static characteristic.

4.2.21. The generating source should be capable of continuous operation at rated power within the following range of changes:

a) Frequency: $49.0 \leq f \leq 51.0$ Hz,

b) Voltage $U \geq 0.85\ U_n$

where U_n – rated voltage at the point of connection

Minimum times during which the facility must be able to operate at different frequencies, deviating from the nominal value, without disconnecting from the network:

Frequency range	Working time
47.5 Hz – 48.5 Hz	30 minutes
48.5 Hz – 49.0 Hz	30 minutes
49.0 Hz – 51.0 Hz	Unlimited
51.0 Hz – 51.5 Hz	30 minutes

5. Required degree of reactive power compensation, tg ϕ ≤ 0.4.

6. Location of the metering and billing system and measurement systems:

6.1. The metering and billing system (for measuring power and energy drawn from the DSO Glosbe network and fed into the DSO Glosbe network) is to be located at the customer's premises in the main low-voltage distribution board in the 15/0.4 kV transformer station in Jasin – part of plot no. 303/44 – without changes,

6.2. Measuring systems (for measuring energy produced by generating equipment) – optional, at the customer's discretion. The measuring system should be implemented in accordance with point 7.

7. Requirements for the metering and billing system and measurement systems:

7.1. The measuring systems used must meet all requirements for modern remote reading meters defined in the Regulation of the Minister of Climate and Environment of 22 March 2022 on the measuring system,

7.2. The metering and billing system referred to in point 6.1 is the property of the customer, excluding the meter and data transmission system:

7.2.1. Install a semi-indirect metering and billing system at a voltage of 0.4 kV - no changes,

7.2.2. Transformers should:

7.2.2.1. Possess a calibration certificate issued by the Central Office of Measures or a laboratory accredited by the Polish Centre for Accreditation (PCA),

7.2.2.2. Have an accuracy class of no worse than 0.2 s (applies to current transformers),

7.2.2.3. Have a device safety factor of no more than 5 (applies to current transformers),

7.2.2.4. Current transformers should be selected so that the primary current resulting from the contractual power is within the range of 1-120% of the rated current,

7.2.2.5. Be selected so that the secondary side load is between 25% and 100% of the nominal power of the transformer windings/cores. If additional load is necessary, certified resistors installed in sealable housings should be used.

7.2.3. Secondary current circuits should be run directly from the transformer terminal strips to the measuring strip,

7.2.4. All elements of the power supply unit, as well as covers and devices included in the measurement and billing system should be suitable for sealing,

7.2.5. The meter and other auxiliary elements should be installed in a measuring cabinet.

7.3. The measuring systems referred to in point 6.2 are the property of the customer and must be installed in accordance with point 7.4 or 7.5.

7.4. For individual measurement systems located on the generating source:

7.4.1. Install semi-indirect measurement systems with active energy meters.

7.4.2. Electricity meters should:

7.4.2.1. They must have type approval and valid legalisation from the Central Office of Measures or be compliant with the MID (Measuring Instruments Directive) Standards,

7.4.2.2. Have an accuracy class of no worse than 1 for active energy,

7.4.2.3. Record and store active power measurements for periods of 15 to 60 minutes for at least 63 days,

7.4.2.4. Automatically close the billing period,

7.4.2.5. Have a signal indicating the presence of measuring voltage.

7.4.3. They should be adapted to remote time synchronization via the CSPR OSD Glosbe measurement system,

7.4.4. All elements of the power supply unit, as well as covers and devices included in the measuring system, should be suitable for sealing,

7.4.5. Meters and other auxiliary elements should be installed in a measuring cabinet,

7.4.6. For semi-indirect measuring systems, transformers should:

7.4.6.1. Possess a calibration certificate issued by the Central Office of Measures or a laboratory accredited by the Polish Centre for Accreditation,

7.4.6.2. Have an accuracy class of no worse than 0.2 s (applies to current transformers),

7.4.6.3. Have a device safety factor of no more than 5 (applies to current transformers),

7.4.6.4. Current transformers should be selected so that the primary current resulting from the contractual power is within the range of 1-120% of the rated current,

7.4.6.5. Be selected so that the secondary side load is within 25-100% of the nominal power of the transformer windings/cores. If additional load is necessary, certified resistors installed in sealable housings should be used.

7.5. For a common measurement system (in the event of individual measurement systems):

7.5.1. Install a semi-indirect measuring system with an active energy meter,

7.5.2. The electricity meter should:

7.1.1.1. Be type approved and have a current Central Office of Measures certification or comply with the Measuring Instruments Directive,

7.1.1.2. Have an accuracy class not worse than 1 for active energy,

7.1.1.3. Record and store active power measurements for periods of 15 to 60 minutes for at least 63 days,

7.1.1.4. Automatically close the billing period,

7.1.1.5. Have a signal indicating the presence of measuring voltage.

7.1.2. Should be adapted to remote time synchronization via Glosbe's Central Measurement and Billing System,

7.1.3. All elements of the power supply unit, as well as covers and devices included in the measuring system, should be suitable for sealing,

7.1.4. Meters and other auxiliary elements should be installed in a measuring cabinet,

7.1.5. Transformers should:

7.1.5.1. Possess a calibration certificate from the Central Office of Measures or an accreditation from the Polish Centre for Accreditation,

7.1.5.2. Have an accuracy class of not less than 0.2 s (applies to current transformers),

7.1.5.3. Have a device safety factor of no more than 5 (applies to current transformers),

7.1.5.4. Current transformers should be selected so that the primary current resulting from the contractual power is within the range of 1-120% of the rated current,

7.1.5.5. Be selected so that the secondary side load is within 25-100% of the nominal power of the transformer windings/cores. If additional load is necessary, certified resistors installed in sealable housings should be used.

7.2. Install the transmission system:

7.2.1. In the measurement and billing system specified in point 6.1., the data transmission system will be the property of the Glosbe DSO.

7.2.2. Remote data transmission systems will be implemented via fiber optic infrastructure using TCP/IP communication protocol layers,

7.2.3. Data transmission from meters should be carried out via serial interfaces,

7.2.4. Technological devices of communication systems should be approved by the ministry responsible for communications, allowing for the installation and use of the devices in the territory of the Republic of Poland.

7.3. Additional requirements:

7.3.1. Coordination in Glosbe of the documentation of the designed measurement systems and the measurement data transmission system,

7.3.2. Implementation of measurement systems and measurement data transmission systems at the customer's own expense and effort, based on the agreed documentation,

7.3.3. Reporting readiness for technical inspection to DSO Glosbe,

7.3.4. Conducting successful tests for transmitting measurement data in consultation with DSO Glosbe.

8. Type and location of security measures:

Execute in accordance with the agreed design.

9. Value for calculation:

9.1. Short circuit power – 245 MVA on the 15 kV MV switchgear busbars in the Swarzędz HV/MV Main Power Supply Station.

9.2. The resultant earthing resistance (working and protective) should be: Ruz ≤ 3.0 Ω. The measurement should be performed with the MV cables, artificial earthing of the station and PEN conductors of LV cables connected.

9.3. The resistance of the artificial earthing should be Ruz ≤ 5.0 Ω. The artificial earthing should be horizontal and vertical, enabling the connection of all natural earthing electrodes.
ATTENTION: The given technical data should be confirmed by the author of these connection conditions at the stage of developing the design documentation.

10. Data and information about the network for the selection of a shock protection system:

10.1. The power grid is equipped with automatic reclosing and transfer switching devices, which can cause interruptions lasting up to several seconds.

10.2. In terms of protection against electric shock, the following requirements must be met:

10.2.1. Until new regulations are published, the requirements specified in the Regulation of the Minister of Industry No. 473 of October 8, 1990 (Journal of Laws No. 81) shall apply,

10.2.2. The requirements of Polish standards apply to electrical installations.

11. Requirements for protection and network automation:

Design the automation to immediately disconnect the generating source upon any disturbance resulting in a voltage loss in the 15 kV MV DSO Glosbe network. The protection and automation systems must meet the requirements of the NC RfG and IRiESD to the extent not covered by the NC RfG. Determining the conditions for detuning the protection should be agreed upon at the design stage.

12. Requirements for dispatch control systems:

The operation and maintenance of generating equipment will be based on the NC RfG and the Grid Code, to the extent not covered by the NC RfG. The ability to transmit signals required for monitoring and controlling energy production from the customer's equipment to the Glosbe SCADA system will be provided.

13. Requirements for protecting the network against electrical interference:

13.1. Installed devices must meet the requirements of the NC RfG and IRiESD to the extent not covered by the NC RfG provisions or standards, and must have the appropriate approvals. These devices must not interfere with the operation of other customers' networks or installations..

13.2. If the quality requirements specified in point 14.1 are not met, it will be necessary to install, at the expense and effort of the customer, devices that eliminate the adverse impact of the customer's devices on the Glosbe DSO network.

14. Additional notes:

14.1. Installed devices should meet the requirements of the standards and have the appropriate certificates. Connected devices should have the required immunity to electromagnetic disturbances and should be designed so that they do not cause electromagnetic disturbances in their environment that exceed the immunity to such disturbances of other devices present in that environment.

14.2. The implementation of power supply based on the connection conditions in question will constitute the basis for including in the distribution services agreement or comprehensive agreement the quality parameters of electricity in terms of frequency and voltage deviations, voltage distortion and the content of individual harmonics in accordance with the provisions of applicable law, while the permissible duration for the energy drawn by the customer from the Glosbe DSO network:

14.2.1. A single interruption in the supply of electricity may not exceed in the event of:

14.2.1.1. Planned break 16h,

14.2.1.2. Unplanned breaks 24h,

14.2.2. Breaks during the year, being the sum of the duration of one-off long and very long breaks, in the case of:

14.2.2.1. Planned breaks 35h

14.2.2.2. Unplanned breaks 48h

14.3. The energy storage device must be capable of providing reactive power at the connection point, at maximum capacity, resulting from cosϕ = 0.95 in the direction of reactive power consumption and production. When the energy storage device is loaded with active power in the range below the maximum capacity up to 0.1 times the maximum capacity, the entire available reactive power must be made available, in accordance with technical possibilities, but not less than the value resulting from cosϕ = 0.95 (for the current active power), both in the direction of reactive power consumption and production.

14.4. Prior to connection, the customer is obligated to develop and agree with Glosbe the Operational Cooperation Instructions, taking into account the conditions specified in the NC RfG and the IRiESD to the extent not covered by the NC RfG. The instructions will be agreed upon before the customer's facility is connected to the Glosbe network.

14.5. The basis for commencing the design, construction, and assembly work specified in these terms and conditions is the connection agreement.

14.6. Construction and execution designs prepared on the basis of the connection conditions in question must be agreed with Glosbe.

14.7. In the event of overloads of medium voltage network elements supplied from the main power station K-727 transformer station and voltage problems, the operation of the energy storage may be limited or it may be completely shut down.

14.8. Before the energy storage facility is launched, the customer will provide the Glosbe DSO with the current parameters of the generating source's equipment (basic devices and control systems), necessary to conduct system analyses. In the pre-launch phase, this includes data from the device manufacturers. Furthermore, for the purposes of balancing the National Power System, the Investor must provide the energy storage facility with the necessary data specified by Glosbe prior to its launch.

14.9. Glosbe reserves the right, in justified cases, to refuse consent to connect the energy storage facility to the Glosbe DSO network or to allow the storage facility to operate at a power lower than the storage facility's current production capacity.

14.10. In particular, such a situation may occur in the event of a failure in the Glosbe distribution network, which prevents the collection of all stored energy.

14.11. In situations where the system's operational security is at risk, Glosbe may instruct the energy storage to be completely shut down. The energy storage will be shut down remotely via the Glosbe DSO SCADA system.

14.12. Interruptions or restrictions on the operation of the distribution network introduced by Glosbe, for the period of their duration and the liquidation of their effects, shall not constitute non-performance or improper performance of the Agreement for the provision of electricity distribution services for the customer, and any damage resulting from, among others, the situations described in points 14.7., 14.9. and 14.11. cannot be the basis for the customer to pursue any claims for compensation.

14.13. The energy storage facility will be shut down remotely in the situations described in point 14.11 from the Glosbe DSO SCADA system by switching off the disconnector owned by Glosbe that connects the energy storage facility to the Glosbe network.
In the event of complete shutdown of the energy storage facility, the power supply for own needs will be maintained.

14.14. Cooperation between the Glosbe DSO dispatch services and the customer's on-duty personnel after connection to the network will take place on the principles specified in the Distribution Network Operation and Maintenance Manual and the Instruction for Operational Cooperation.

14.15. The facilities must be equipped with telemechanics and telecommunications devices and the necessary connections to provide communication and online data transmission on the status of the electricity storage to Glosbe in accordance with the requirements of the Distribution

Network Operation and Maintenance Manual.

14.16. Schedule for connecting the energy storage facility is specified in the agreement for connection to the Glosbe grid.

14.17. The customer will provide the premises or places where the electricity meter, modem and antenna are installed free of charge and will cover other costs related to the maintenance of these premises or places.

14.18. At the stage of agreeing on the design documentation, the customer will present to Glosbe a project of the method of developing the plots designated for the development of the electricity storage facility, taking into account free access and access of Glosbe services to the existing network infrastructure belonging to Glosbe DSO.

14.19. The validity period of the connection conditions expires after two years from the date of their issue.

14.20. Any additional costs incurred by third parties resulting from the implementation of the above conditions shall be borne by the applicant.

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