# VOLUME 3

**Supply and installation of 20kw photovoltaic system and electric car charging station in Resen**

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# TECHNICAL SPECIFICATIONS

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| **Supply and installation of 20kw** **photovoltaic system and electric car charging station in Resen**  |
| **ELECTRICAL INSTALLATIONS – CONSTRUCTION**  |
| **No** | **Description** | **unit** | **quantity** | **unit price** | **total euro** |
| E1.1 | Supply, transport and installation of aluminum profiles ( as sub construction) with all required connecting elements  | Piece  | 142 |  |  |
| - length 54cm  |
| E1.2 | Supply of ending holders for attachment of modules  | Piece | 44 |  |  |
| E1.3 | Supply of middle holders for attachment of modules  | Piece | 98 |  |  |
| E1.4 | Supply , transport and installation of monocrystal photovoltaic panels with power of 330WDimensions: 99 x 164 x 4,00cm Photovoltaic module should has the following certificates: * ISO 9001:2015
* ISO 14001:2015
* BS OHSAS 18001
* MKC EN 61215:2010
* MKC EN IEC 61730-1:2018
* MKC EN IEC 61730-2:2018
* CE Certificat
* SGS TUV SAAR – IEC 61215 and IEC 61730

Mechanical warranty from the producer with the duration of 10 years. Technical warranty with duration of 25 years.  | Piece  | 60  |  |  |
|  | **TOTAL E1 without VAT (euro)** |  |
| E2  | **E2 – ELECTRICAL INSTALLATIONS – INVERTERS AND DISTRIBUTION CABINETS**  |  |
| E2.1 | Supply , transport and installation of three-phase Grid Connected inverter from European origin 17.5kW , with following specifications :* nominal power of 17.5 kW
* maximum recommended power of PV modules of 20.12 kW ( recommended maximum overload 15% of nominal power)
* 2(two) MPP trackers
* Working range : 200-1000 VDC
* Working range in maximum power point MPP:370-800 VDC
* Number of springs per entry : 3X3
* warranty 5 years
 | Piece  |  1 |  |  |
| E2.2  | Supply , delivery and wall mounting at a height of 1.5 m in an electrical room, DC distribution cabinet , degree of protection IP65 with cable editorials on the bottom and top side, equipped with following equipment  |  |  |  |  |
|  | - surge drainer, class 2 , In=20kA, Imax = 40kA, Up>1kV | Piece  | 2 |  |  |
|  | - cylinder patrons photovoltaic .g PV with nominal voltage of 1000V ( nominal current per project). | Piece  | 3 |  |  |
|  | - system of busbars for connection of positive and negative potential ( one for "+" and one for "- ") , one for MPPT1 and 1 for MPPT2 | Piece  | 2 |  |  |
| E.2.3 | Supply , delivery and wall mounting at a height of 1.5 m in corridor, AC distribution cabinet, degree of protection IP65 with cable editorials on the bottom and top side, equipped with following equipment | Piece | 1 |  |  |
|  | - automatic fuse B32A 3P , with short circuit current switching power ICU=10kA. The protection device must meet the standard IEC/EN 60269-1  | Piece | 1 |  |  |
|  | - system of busbars for L1, L2, L3 , N | Piece | 1 |  |  |
|  | - busbar for connection of protective conductor (PE) rail  | Piece | 1 |  |  |
| Е2.4 | Device for reading the values of the inverter (monitoring system)- DATA LOGGER | Piece | 1 |  |  |
| E2.5 | Supply , delivery and wall mounting at a height of 1.5, AC distribution cabinet , degree of protection IP65 with cable editorials on the bottom and top side, equipped with following equipment* three-pole blade fuse with nominal electricity of 80A
* system of busbars for L1, L2, L3 , N
* busbar for connection of protective conductor (PE) rail
* three-phase CEE 63A power station connection
* surge arresters T2 Ucpv ≥ 1.45 x Uf
 | Piece | 1 |  |  |
| E2.6 | Supply, transport and installation of a charging station for electrical cars of European origin, with the following specifications: -nominal power 2 x 22 KWAC (32A)-protective housing- LCD monitor-load management controller-RFID authorization-online 24/7 access to the charger- ideal for the private sector-operating temperature: -20 ° C to + 55 ° C-protective class: IP54-Dimensions: 1460 x 780 x 200mm- adjusted with IEC61851 Mode 3 -CE certificate  | Piece | 1 |  |  |
|  | **TOTAL E2 without VAT (euro)** |  |
| E3 | **ELECTRICAL INSTALLATIONS – SOLAR AND INSTALLATION CONDUCTOR**  |  |  |  |  |
| E3.1 | Supply, delivery and mounting conductor – type: Solar cable PV1-F 0.6/1kV 1x4mm2 For connection between every springs and appropriate DC distribution cabinet  | M  | 230 |  |  |
| E3.2 | Supply, delivery and mounting conductor – type: Solar cable PV1-F 0.6/1kV 1x4mm2 For connection between appropriate DC distribution cabinet and the inverter  | m | 5 |  |  |
| E3.3 | Supply, delivery and mounting conductor - type: Energy cable PP00-A 0.6/1kV 4x50 mm2For connection between MDB and electrical car charging station.  | m | 25 |  |  |
| Е3.4 | Supply, delivery and mounting single core cable type P/F 1x25mm2 0.6/1kV for ground connection between MDB and electrical car charging station.  | m | 25 |  |  |
| E3.5 | Supply, delivery and mounting conductor – type * Conductor P/F 1x10mm2

For connection for protective grounding from the modules to the DC cabinet | m | 42 |  |  |
| E3.6 | Supply, delivery and mounting conductor – type Energy cable PP00-Y 5x6mm2for connection between the inverter and AC distribution cabinet . The cable will be dragged on the walls , within PVC canal ( 60x60)  | m | 2 |  |  |
| E3.7  | Supply, delivery and mounting conductor – type Energy cable PP00-Y 5x6mm2for connection between AC distribution cabinet and DB. The cable will be dragged on the walls , within PVC canal ( 60x60) |  |  |  |  |
|  | **TOTAL E3 without VAT (euro)** |  |
| E4 | **OTHER ELECTRICAL EQIPMENT** |  |  |  |  |
| E4.1 | MC connectors for springs connection  |  |  |  |  |
|  | - MC4 for „+“ potential  | Piece  | 3 |  |  |
|  | - MC4 for „- “ potential | Piece  | 3 |  |  |
| E4.2 | - LAN cable, screws and others  | total | 1 |  |  |
| E4.3 | Supply and installation of metal canal 50x60 for solar cable  | m | 40 |  |  |
| E4.4 | Supply and mounting of metal canal for energy cable between MDB and electrical cars charging station  | m | 15 |  |  |
| E4.5 | Supply and mounting of PVC canal ( 60x60) for solar and energy cables guiding | m | 15 |  |  |
| E4.6 | Supply of perforated tape for mounting of flexible intestine on aluminum roof  | piece | 1 |  |  |
| E4.7 | Supply and mounting of flexible intestine with Ф16mm2  | m | 10 |  |  |
| E4.8 | Measuring gage for data record on production and consumption of electricity | piece | 1 |  |  |
|  | **TOTAL E4 without VAT (euro)** |  |
|  | **TOTAL E1+E2+E3+E4 without VAT (euro)** |  |
| AW | **ADDITIONAL WORKS**  |  |  |  |  |
| AW1.1 | Contingency reserve – Additional works, occurred due to unexpected situation, from those planned in tech. document (max 10% of (E1+E2+E3+E4) ) | % |  |  |  |
|  | **TOTAL CR without VAT (euro) :** |  |
| **M** | **MARKING [[1]](#footnote-1)** |  |
|  M 1.1 | Information sign, with dimensions: 300 x 220 mm | Piece  | 2 |  |  |
| M 1.2 | Explanatory plaque, with dimensions: 1200 x 80mm , manufactured of resistant material – metal with protective layer | Piece  | 1 |  |  |
|  | **TOTAL : E1+E2+E3+E4+CR+OS without VAT (euro)** |  |

1. Marking should comply with the relevant rules lay down in the Communication and Visibility Manual for EU External Actions published by the European Commission. <http://www.ipa-cbc-programme.eu> [↑](#footnote-ref-1)