

# **ANNEX II + III: TECHNICAL SPECIFICATIONS + TECHNICAL OFFER**

**Contract title: Supply of equipment for solid waste source separation schemes in 4 regions**

**Publication reference: EuropeAid/140442/IH/SUP/RS**

**Columns 1-2 should be completed by the contracting authority**

**Columns 3-4 should be completed by the tenderer**

**Column 5 is reserved for the evaluation committee**

Annex III - the contractor's technical offer

**Lot 2: Supply of Refuse Collection Vehicles.**

- a) **12 m<sup>3</sup> Refuse Collection Vehicles (RCV)** capacity with hydraulic press compaction type , with rear loading, able to handle both 120/240-litre bins and 1.1 m<sup>3</sup> containers, 3 pcs.
- b) **16 m<sup>3</sup> Refuse Collection Vehicles (RCV)** capacity with hydraulic press compaction type , with rear loading, able to handle both 120/240-litre bins and 1.1 m<sup>3</sup> containers, 12 pcs.
- c) **20 m<sup>3</sup> Refuse Collection Vehicles (RCV)** capacity with hydraulic press compaction type with rear loading, able to handle both 120/240-litre bins and 1.1 m<sup>3</sup> containers, 11 pcs.

## **Project description**

The purpose of this contract is purchase of RCVs for the Public Utility Companies (PUCs), in order to enable local waste operators – PUCs, to organize systematic collection and transport of dry municipal solid waste fraction – recyclables, from households to the waste transfer stations or directly to secondary separation line at the Regional Waste Management Centres (RWMCs).

Department for Contracting and Financing of EU Funded Programmes (CFCU) of the Ministry of Finance of the Republic of Serbia is the Contracting Authority responsible for this project. The beneficiary of this Contract (Beneficiary) is the Ministry of Environmental Protection.

## **1) General Provisions**

The Refuse Collection Vehicles (RCVs) considered to include both the truck and superstructure to be supplied must conform to the Detailed Technical Specification given below.

The RCVs shall be suitable for operation in all climatic conditions in the territory of Serbia.

The RCVs has to be fully assembled, new (produced in 2020 or later) and unused with enclosed documentation for traffic registration and normal traffic usage. Both production and assembly must fully comply with all relevant and necessary Serbian laws and regulations.

Producer must to submit statement of conformity and acceptance of the requested warranty period and conditions for the complete vehicles, in particular for power train failure and anticorrosion protection.

Each RCV must have marking in accordance the Communication and Visibility in EU-financed external actions requirements (<https://ec.europa.eu/europeaid/work/visibility/en>).

## **2) Service Provisions**

### **2.1 Performance**

The Tenderer shall provide a copy of published data concerning performance tests on the models offered.

### **Verification operations and warranty conditions**

**Installation:** The Contractor will be responsible for installation, configuration and start-up of the supplies delivered in accordance with the directions provided by the Beneficiary. The Beneficiary reserves the right to done the testing equipment after installation is finished

**Testing:** Items shall be tested during the takeover event, where all the required specifications and features shall be accounted for, and full functionality of the items shall be presented.

**Warranty** for this Lot is 12 months, starting from the date of issuance of Provisional Acceptance Certificate

**Commercial warranty:** Commercial warranty for this Lot is minimum 24 months, starting from the date of issuance of Final Acceptance Certificate .

### **2.3 Support Services**

The Tenderer shall be able to provide all relevant technical assistance to the users and all documentation for quality maintenance at prevailing market prices for a period of at least 7 years.

The Tenderer shall be able to provide repairs or replacements in line with the warranty, at a location within Serbia. The Tenderer to provide a list of authorised service sites to fulfil this requirement.

### **2.4 Training**

The Tenderer shall provide appropriate training for the operation and maintenance of the RCVs to the end user. The training will be organized at the user's service workshops, in Serbian language. Further details are in the Detailed Technical Specification given below.

## **3) Technical Specifications**

### **3.1 Capacity**

Body of the RCVs shall have a payload capacity as set out in the Detailed Technical Specifications.

### **3.2 Detailed Specification**

The required Technical Specifications have been provided by the Contracting Authority. The Tenderer's Technical Offer should meet or exceed the requirement stated.

The Tenderers are requested to complete the template on the next pages, for each specific requirement:

- Column 2 is completed by the Contracting Authority shows the required specifications (not to be modified by the Tenderer),

- Column 3 is to be filled in by the Tenderer and must detail what is offered (for example the words 'compliant', 'included' or 'yes' are not sufficient). Where compliance with a specific standard is included as a requirement, the Tenderer shall provide certificates of compliance in each case,
- Column 4 allows the Tenderer to make comments on its proposed supply and to make eventual references to the documentation.

The eventual documentation supplied should clearly indicate (highlight, mark) the models offered and the options or extras included, if any, so that the Evaluators can see the exact configuration. Offers that do not permit to identify precisely the models and the specifications may be rejected by the Evaluation Committee.

The offer must be clear enough to allow the evaluators to make an easy comparison between the requested specification and the offer specifications.

**Detailed Technical Specifications**

**Item 1) Refuse Collection Vehicle of 12 m<sup>3</sup> Capacity,  
[Quantity: 3 pcs.]**

<b>Item Number</b>	<b>Specifications Required</b>	<b>Specifications Offered</b>	<b>Notes, remarks, ref to documentation</b>	<b>Evaluation Committee's notes</b>
<b>Truck Chassis</b>				
a. Truck Type	1) Year of manufacturing is 2020 or later			
	2) Rigid truck with drive on rear axle			
	3) Wheel configuration to be 6 wheels on 2 positions (i.e. 4 x 2)			
	4) GWV is max 16,000 kg			
	5) Designed to carry a waste disposal body with min 12 cubic metres capacity			
b. Cabin	1) Day cab shall be provided with own mechanical suspension and hydraulic tilting without rear window			
	2) Three seats with safety belt in the cabin (i.e. driver adjustable seat plus two fix seats for operators)			
	3) Electro powered cabin windows			
	4) Air conditioner installed			
	5) Radio with AUX i USB connector			
c. Chassis Frame	1) Designed for a minimum non-failure working period of 6 (six) years with the vehicle working in all road conditions			
	2) Corrosion protection for a minimum of 3 (three) years			
d. Engine	1) Diesel engine with minimum 175 kW power output, (i.e. per ECE R24-03/ISO 1585, 88/195 EEC to Directive 80/1269 EEC)			
	2) Exhaust emissions comply to EURO 6 standard			
	3) Vertical direction of exhaust pipe behind the truck cab			
e. Gearbox	1) Automated manual transmissions (AMT) without retarder			
	2) Gearbox input torque to comply with engine torque outputs			
f. Steering	1) Left hand drive			

	2) Power assisted steering (Steering force in accordance with Regulation R-79.01 or Directive 70/311 EEC, as amended by Directive 92/62 EEC or Directive 1999/7 EC)			
	3) Adjustable steering column			
g. Suspension	1) Front suspension with leaf-type springs or air-type suspension			
	2) Rear suspension with leaf-type springs or air-type suspension			
	3) Hydraulic-type shock absorbers			
	4) Stabilizer on front and rear axle			
h. Axles	1) Front: Specify capacity allowing weight distribution as per Gross vehicle weight min 7.000 kg (G.V.W.)			
	2) Rear: Specify capacity allowing weight distribution as per Gross Vehicle Weight min 11.500 kg (G.V.W.)			
	3) Power drive on rear axle			
i. Brake System	1) In accordance with Regulation ECE R-13.09 or Directive 71/320 EEC as amended by Directive 98/12 EC with ABS system			
	2) Dual-circuit disc brake system with brake pad wear indicators			
	3) Engine brake actuated by the brake pedal			
	4) Parking brake operated by spring actuators on rear axle			
j. Wheels & Tyres	1) Tyres on steel disc rim			
	2) Spare wheel to be delivered			
k. Electrical System	1) Voltage 24 volt			
	2) Two high capacity maintenance-free batteries			
l. Other General Equipment	1) Digital tachograph for two drivers			
	2) Electro powered front wipers and washers			
	3) Light indicator for low air pressure with audible warning			
	4) Light indicator for low engine oil pressure, with audible warning			
	5) Audible indicator warning at reverse vehicle movement			
	6) Easy access of fire extinguisher installed in the cabin			
	7) Fuel tank with corrosion protection 3 (three) years			
	8) Anti-vandalism filling cap, lock protected			

	9) At the front side towing/pushing pin			
	10) Noise emission level in accordance with Directive 92/97 EEC			
	11) Under run protection device on the left and right side of the truck chassis in compliance with EC directives			
	12) Set of standard tools provided			
	13) Over rear wheels mud guards or wheel arches			
	14) Two chocks for the tire mounted on the chassis			
	15) Vehicle to be colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b>			
	16) Side mirrors in truck is wide-angle mirrors electric adjustable and heatable			
	17) At the right side added blind spot mirror – “ramp mirror”			
	18) Two orange rotary LED lights on the roof of the vehicle			
<b>Superstructure</b>				
a. General	1) The dimensions and weights of the proposed chassis/superstructure shall be appropriate for satisfactory safety and stability. The bidder shall submit all relevant drawings and calculations including calculations of the distribution of the weight over the axles. The bidder shall present any required drawings/ calculations to show that the maximum weight (i.e. total dead weight + payload) is compatible with the truck specifications			
	2) Superstructure is on the counter chassis			
	3) At the rear side hydraulic lifting device shall be suitable for collection of household waste and bulky waste and for handling standard wheel bins and containers capacity from 120 lit to 1.1 m <sup>3</sup> (EN – 840)			

	4) Greasing points on all main bolts, main shafts of lifting device and hydraulic cylinders Main bolts must be reinforced and chromed or radial spherical plain bearings (G bearings) should be used for these support shafts/points			
	5) Net capacity of body min 12 m <sup>3</sup>			
	6) Seal or type of construction between the loading compartment and the tailgate is required to prevent leakage or at the lower position under the tailgate it is waste water container to prevent any leakage between body and tailgate. Waste water container is with draining tap			
	7) Superstructure to be double layer colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b> (same colour as truck)			
b. Construction	1) Loading system consist of the drum with 2 transport coils on the inner side of the container and an aguer for compaction. Minimal drum diameter 2.200 mm, minimal thickness 6 mm			
	2) Bearing support of the drum container on the rear side with an integrated radial and axial bearing which covers the entire outer diameter of the drum and on the front by the centrally positioned hub and one radial and axial bearing resting on the frame. Gear power transmission to the drum by gear pair, outer diameter of the drum covered with the gear.			
	3) Noise insulation incorporated in the superstructure construction			
c. Compaction Mechanism	1) Compaction ratio is minimum 1:5			
	2) Compaction is made only with the drum rotation			
	3) The driver can select the fraction. Drum rotation stops when the maximum load is exceeded.			

	4) Compaction auger made as one-piece part of steel thickness minimum 40 mm, including stiffening, with additional interchangeable plates made of highly wear-resistant steel. Plates connected for the auger with screws.			
d. Hopper/ Tailgate	1) Tailgate operations: lifting, lowering, locking, unlocking – with the help of hydraulic			
	2) Automatic unlocking/locking when opening/closing the tailgate			
e. Hydraulics	1) Hydraulic reservoir with level meter			
	2) All hydraulic cylinders must be new not repaired			
	3) System equipped with filter with visual dirt indicator in return line			
	4) Double pump incorporated to enable independent operation of the compaction mechanism and the container loading device			
	5) Hydraulic cylinders with load-holding valve or hose burst valves provided on the hydraulic circuit that opens the tailgate in order to prevent a sudden drop of the tailgate			
f. Electrics	1) Voltage: 24 volts electrical system			
	2) Circuits protected from overvoltage with appropriate connections for use in hazardous environments, with fuses or automatic circuit breakers			
	3) In order to facilitate easy trouble shooting and repair, the electrical circuits to be provided with colour or number coding on the cable looms and wiring as well as on the various connector strips.			
	4) Wire will be with brass insulated cord electric wire end terminals			
	5) Light equipment in accordance Regulation ECE – R 48.01 and minimum IP55 standard is applied			
	6) Two working LED lights (reflectors) over the tailgate			
	7) One moving working LED light (reflector) fitted behind the vehicle			

	8) One orange rotary LED light on the left side roof of the superstructure			
	9) The necessary sensors - detectors for the electric devices-actuators in the superstructure should be connected through a programmable logic controller (PLC), in accordance with the European Standard EN 1501.			
g. Operation and Controls	1) The possibility to control body operations from the cabin, using the multifunctional control panel with operation indicator as well as control vehicles operation			
	2) During lifting or emptying containers engine operates at optimum torque			
	3) Engine revs increase automatically to the optimum torque when superstructure operates			
	4) All functions electro-hydraulically controlled			
	5) All lifting operations via push buttons or levers			
	6) Function of controls to be clearly indicated either by text in Serbian language or internationally accepted symbols			
	7) "Hold to Run" type of controls			
	8) Emergency stop button in the driver's cabin			
	9) Position of tailgate opening/closing control in accordance with EN 1501 standard			
h. CCTV Camera	1) The superstructure to be fitted with a camera at the rear of the vehicle integrated in multifunctional control panel in the cabin			
<b>Loading Devices</b>				
a. Loading devices for standard waste containers, 1.1 m3 capacity and 240-litre wheel bins	1) Lifting capacity is min 600 kg			
	2) Lift and loading device suitable for handling standard waste containers of 1.1 m3 capacity conforming with DIN 30700 or EN 840 – 3 (i.e. with pick up at lateral trunnions via folding arms) and also standard 120-litre and 240-litre wheel bins			
	3) Lift devices in accordance with EN1501			
	4) Controls for the lifting and lowering movement are at both sides at rear side of vehicles			

	5) Two separate lifting and loading devices provided on each side (i.e. devices capable of operating separately to lift and load the standard 120-litre and 240-litre wheel bins and also operating together to lift and load the standard 1.1 m3 waste containers			
	6) Loading height of rave rail in accordance standard EN 1501			
	7) Maximum cycle time (up and down) for handling of the containers of min. 15 seconds			
	8) Automatic lid opener incorporated in loading device for the waste containers of 1.1 m3 capacity			
b. General	1) Foot stands (which are capable of being folded up) with hand grips provided at both sides at the rear of the vehicle in accordance with EN 1501 standard			
	2) Superstructure waterproofed to avoid any leakage during compaction and transportation			
<b>Additional Requirements</b>				
<b>Legal Requirements</b>				
a. General	1) The vehicle shall comply with the stipulated requirements of any relevant legislation pertaining in Serbia as well with any applicable Serbian or International (ISO) regulations and standards, where there are no Serbian standards.			
	2) The vehicle shall be suitable for operation in all climatic conditions on the Serbia territory			
<b>Documentation</b>				
Documentation	The following documentation to be provided within delivery: 1) User's operation manual 2) Maintenance manual 3) Service manual 4) Spare part catalogues 5) Homologation (Attest - certificate of compliance with the Serbian law and regulation) 6) Original invoice			

<b>Training for the end user staff</b>				
Short training course	1) One day on-site training (during delivery process) to be provided in vehicle driving and in regular operation and maintenance.			
	2) Training course to be in Serbian Language			
	3) Each trained worker will receive a certificate as a statement that the person is informed and awarded for the safety and secure usage of all systems installed on the vehicle			

**Detailed Technical Specifications**

**Item 2) Refuse Collection Vehicle of 16 m<sup>3</sup> Capacity,  
[Quantity: 12 pcs.]**

<b>Item Number</b>	<b>Specifications Required</b>	<b>Specifications Offered</b>	<b>Notes, remarks, ref to documentation</b>	<b>Evaluation Committee's notes</b>
<b>Truck Chassis</b>				
a. Truck Type	1) Year of manufacturing 2020 or later			
	2) Rigid truck with drive on rear axle			
	3) Wheel configuration to be 6 wheels on 2 positions (i.e. 4 x 2)			
	4) GWV is max 19,000 kg			
	5) Designed to carry a waste disposal body with min 16 cubic metres capacity with a further minimum 1.5 cubic metres in the hopper			
b. Cabin	1) Day cab shall be provided with own mechanical suspension and hydraulic tilting without rear window			
	2) Three seats with safety belt in the cabin (i.e. driver adjustable seat plus two fix seats for operators)			
	3) Electro powered cabin windows			
	4) Air conditioner installed			
	5) Radio with AUX i USB connector			
c. Chassis Frame	1) Designed for a minimum non-failure working period of 6 (six) years with the vehicle working in all road conditions			
	2) Corrosion protection for a minimum of 3 (three) years			
d. Engine	1) Diesel engine with minimum 210kW power output (i.e. per ECE R24-03/ISO 1585, 88/195 EEC to Directive 80/1269 EEC)			
	2) Exhaust emissions comply to EURO 6 standard			
	3) Vertical direction of exhaust pipe behind the truck cab			
e. Gearbox	1) Automated manual transmissions (AMT) without retarder			
	2) Gearbox input torque to comply with engine torque outputs			
f. Steering	1) Left hand drive			
	2) Power assisted steering (Steering force in accordance with Regulation R-79.01 or Directive 70/311 EEC, as amended by Directive 92/62 EEC or Directive 1999/7 EC)			

	3) Adjustable steering column			
g. Suspension	1) Front suspension with leaf-type springs or air-type suspension			
	2) Rear suspension with leaf-type springs or air-type suspension			
	3) Hydraulic-type shock absorbers			
	4) Stabilizer on front and rear axle			
h. Axles	1) Front: Specify capacity allowing weight distribution as per Gross vehicle weight min 7.000 kg (G.V.W.)			
	2) Rear: Specify capacity allowing weight distribution as per Gross Vehicle Weight min 12.000 kg (G.V.W.)			
	3) Power drive on rear axle			
i. Brake System	1) In accordance with Regulation ECE R-13.09 or Directive 71/320 EEC as amended by Directive 98/12 EC with ABS system			
	2) Dual-circuit disc brake system with brake pad wear indicators			
	3) Engine brake actuated by the brake pedal			
	4) Parking brake operated by spring actuators on rear axle			
j. Wheels & Tyres	1) Tyres on steel disc rim			
	2) Spare wheel to be delivered			
k. Electrical System	3) Voltage 24 volt			
	4) Two high capacity maintenance-free batteries			
l. Other General Equipment	1) Digital tachograph for two drivers			
	2) Electro powered front wipers and washers			
	3) Light indicator for low air pressure with audible warning			
	4) Light indicator for low engine oil pressure, with audible warning			
	5) Audible indicator warning at reverse vehicle movement			
	6) Easy access of fire extinguisher installed in the cabin			
	7) Fuel tank with corrosion protection 3 (three) years			
	8) Anti-vandalism filling cap, lock protected			
	9) At the front side towing/pushing pin			
	10) Noise emission level in accordance with Directive 92/97 EEC			
	11) Under run protection device on the left and right side of the truck chassis in compliance with EC directives			
	12) Set of standard tools provided			
	13) Over rear wheels mud guards or wheel arches			
	14) Two chocks for the tire mounted on the chassis			

	15) Vehicle to be colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b>			
	16) Side mirrors in truck is wide-angle mirrors electric adjustable and heated.			
	17) At the right side added blind spot mirror – “ramp mirror”			
	18) Two orange rotary LED lights on the roof of the vehicle			
	19) Audible and visible warning in case vehicle is overloaded.			
<b>Superstructure</b>				
a. General	1) The dimensions and weights of the proposed chassis/superstructure shall be appropriate for satisfactory safety and stability. The bidder shall submit all relevant drawings and calculations including calculations of the distribution of the weight over the axles. The bidder shall present any required drawings/ calculations to show that the maximum weight (i.e. total dead weight + payload) is compatible with the truck specifications			
	2) Superstructure is on the counter chassis – reinforced profile			
	3) At the rear side hydraulic lifting device shall be suitable for collection of household waste and bulky waste and for handling standard wheel bins and containers capacity from 120 lit to 1.1 m <sup>3</sup> (EN – 840)			
	4) Greasing points on all main bolts, main shafts of lifting device and hydraulic cylinders Main bolts must be reinforced and chromed or radial spherical plain bearings (G bearings) should be used for these support shafts/points			
	5) Net capacity of body (i.e. not including the capacity of the hopper) is min 16 m <sup>3</sup>			
	6) Seal or type of construction between the loading compartment and the tailgate is required to prevent leakage or at the lower position under the tailgate it is waste water container to prevent any leakage between body and tailgate. Waste water container is with draining tap			

	7) Superstructure to be double layer colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b> (same colour as truck)			
b. Construction	1) In order to reduce wear and tear to the minimum and achieve a low weight, the superstructure floor to be made of high tensile, abrasion and corrosion resistant steel grades min. yield strength 1,250MPa (e.g. "HARDOX 450")			
	2) Continuous welding to be applied throughout the body to avoid the formation of rust			
	3) Noise insulation incorporated in the superstructure construction			
c. Compaction Mechanism	1) Compaction ratio is minimum 1:5			
	2) Electrically-controlled discontinuous cycle compaction system in accordance with standard EN 1501			
	3) Sliding plate has four (4) sliders			
d. Hopper/ Tailgate	1) Hopper capacity minimum 1.5 m <sup>3</sup> (Note: Capacity of the hopper is not included in the capacity of the RCV)			
	2) The base of the hopper to be minimum 8 mm made of high tensile, abrasion and corrosion resistant steel grades min. yield strength 1,250MPa (e.g. "HARDOX 450")			
	3) Automatic unlocking/locking when opening/closing the tailgate			
e. Hydraulics	1) Hydraulic reservoir with level meter			
	2) All hydraulic cylinders must be new not repaired			
	3) System equipped with filter with visual dirt indicator in return line			
	4) Double pump incorporated to enable independent operation of the compaction mechanism and the container loading device			
	5) Hydraulic cylinders with load-holding valve or hose burst valves provided on the hydraulic circuit that opens the tailgate in order to prevent a sudden drop of the tailgate			
f. Electrics	1) Voltage: 24 volts electrical system			
	2) Circuits protected from overvoltage with appropriate connections for use in hazardous environments, with fuses or automatic circuit breakers			
	3) In order to facilitate easy trouble shooting and repair, the electrical circuits to be provided with colour or number coding on the cable looms and wiring as well as on the various connector strips.			

	4) Wire will be with brass insulated cord electric wire end terminals			
	5) Light equipment in accordance Regulation ECE – R 48.01 and minimum IP55 standard is applied			
	6) Two working LED lights (reflectors) over the tailgate			
	7) One moving working LED light (reflector) fitted behind the vehicle			
	8) One orange rotary LED light on the left side roof of the superstructure			
	9) The necessary sensors - detectors for the electric devices-actuators in the superstructure should be connected through a programmable logic controller (PLC), in accordance with the European Standard EN 1501.			
g. Operation and Controls	1) Driver cabin equipped with main switch with warning light to stop all operation of superstructure for safety reasons			
	2) During lifting or emptying containers engine operates at optimum torque			
	3) Engine revs increase automatically to the optimum torque when superstructure operates			
	4) All functions electro-hydraulically controlled			
	5) All lifting operations via push buttons or levers			
	6) Function of controls to be clearly indicated either by text in Serbian language or internationally accepted symbols			
	7) “Hold to Run” type of controls			
	8) Emergency stop button in the driver’s cabin			
	9) Position of tailgate opening/closing control in accordance with EN 1501 standard			
h. Camera	1) The superstructure to be fitted with a camera at the rear of the vehicle with a LCD monitor in the cab			
<b>Loading Devices</b>				
a. Loading devices for standard waste containers, 1.1 m3	1) Lifting capacity is min 600 kg			
	2) Lift and loading device suitable for handling standard waste containers of 1.1 m3 capacity conforming with DIN 30700 or EN 840 – 3 (i.e. with pick up at lateral trunnions via folding arms) and also standard 120-litre and 240-litre wheel bins			
	3) Lift devices in accordance with EN1501			

b. capacity and 240-litre wheel bins	4) Controls for the lifting and lowering movement are at both sides at rear side of vehicles			
	5) Two separate lifting and loading devices provided on each side (i.e. devices capable of operating separately to lift and load the standard 120-litre and 240-litre wheel bins and also operating together to lift and load the standard 1.1 m3 waste containers			
	6) Loading height of rave rail in accordance standard EN 1501			
	7) Maximum cycle time (up and down) for handling of the containers of min. 15 seconds			
	8) Automatic lid opener incorporated in loading device for the waste containers of 1.1 m3 capacity			
c. General	1) Foot stands (which are capable of being folded up) with hand grips provided at both sides at the rear of the vehicle in accordance with EN 1501 standard			
	2) Superstructure waterproofed to avoid any leakage during compaction and transportation			
<b>Additional Requirements</b>				
<b>Legal Requirements</b>				
General	1) The vehicle shall comply with the stipulated requirements of any relevant legislation pertaining in Serbia as well with any applicable Serbian or International (ISO) regulations and standards, where there are no Serbian standards.			
	2) The vehicle shall be suitable for operation in all climatic conditions on the Serbia territory			
<b>Documentation</b>				
Documentation	The following documentation to be provided within delivery: 1) User's operation manual 2) Maintenance manual 3) Service manual 4) Spare part catalogues 5) Homologation (Attest - certificate of compliance with the Serbian law and regulation) 6) Original invoice			

<b>Training for the end-user staff</b>				
Short training course	1) One day on-site training (during delivery process) to be provided in vehicle driving and in regular operation and maintenance.			
	2) Training course to be in Serbian Language			
	3) Each trained worker will receive a certificate as a statement that the person is informed and awarded for the safety and secure usage of all systems installed on the vehicle			

**Detailed Technical Specifications**

**Item 3) Refuse Collection Vehicle of 20 m<sup>3</sup> Capacity,  
[Quantity: 11 pcs.]**

<b>Item Number</b>	<b>Specifications Required</b>	<b>Specifications Offered</b>	<b>Notes, remarks, ref to documentation</b>	<b>Evaluation Committee's notes</b>
<b>Truck Chassis</b>				
a. Truck Type	1) Year of manufacturing is 2020 or later			
	2) Rigid truck with drive on rear axle			
	3) Wheel configuration to be three axles (i.e. 6 x 2x4)			
	4) GWV is max 26,000 kg			
	5) Designed to carry a waste disposal body with min 20 cubic metres capacity with a further minimum 2 cubic metres in the hopper			
b. Cabin	1) Day cab shall be provided with own mechanical suspension and hydraulic tilting without rear window			
	2) Three seats with safety belt in the cabin (i.e. driver adjustable seat plus two fix seats for operators)			
	3) Electro powered cabin windows			
	4) Air conditioner installed			
	5) Radio with AUX i USB connector			
c. Chassis Frame	1) Designed for a minimum non-failure working period of 6 (six) years with the vehicle working in all road conditions			
	2) Corrosion protection for a minimum of 3 (three) years			
d. Engine	1) Diesel engine with minimum 230 kW power output (i.e. per ECE R24-03/ISO 1585, 88/195 EEC to Directive 80/1269 EEC)			
	2) Exhaust emissions comply to EURO 6 standard			
	3) Vertical direction of exhaust pipe behind the truck cab			
e. Gearbox	1) Automated manual transmissions (AMT) without retarder			
	2) Gearbox input torque to comply with engine torque outputs			
f. Steering	4) Left hand drive			

	5) Power assisted steering (Steering force in accordance with Regulation R-79.01 or Directive 70/311 EEC, as amended by Directive 92/62 EEC or Directive 1999/7 EC)			
	6) Adjustable steering column			
g. Suspension	1) Front suspension with leaf-type springs or air-type suspension			
	2) Rear suspension with leaf-type springs or air-type suspension			
	3) Hydraulic-type shock absorbers			
	4) Stabilizer on front and rear axle			
h. Axles	1) Front: Specify capacity allowing weight distribution as per Gross vehicle weight min 7.000 kg (G.V.W.)			
	2) Rear: Specify capacity allowing weight distribution as per Gross Vehicle Weight min 13.000 kg (G.V.W.), steering axle min 9.000 kg (G.V.W.)			
	3) Power drive on rear axle			
i. Brake System	1) In accordance with Regulation ECE R-13.09 or Directive 71/320 EEC as amended by Directive 98/12 EC with ABS system			
	2) Dual-circuit disc brake system with brake pad wear indicators			
	3) Engine brake actuated by the brake pedal			
	4) Parking brake operated by spring actuators on rear axle			
j. Wheels & Tyres	1) Tyres on steel disc rim			
	2) Spare wheel to be delivered			
k. Electrical System	1) Voltage 24 volt			
	2) Two high capacity maintenance-free batteries			
l. Other General Equipment	1) Digital tachograph for two drivers			
	2) Electro powered front wipers and washers			
	3) Light indicator for low air pressure with audible warning			
	4) Light indicator for low engine oil pressure, with audible warning			
	5) Audible indicator warning at reverse vehicle movement			
	6) Easy access of fire extinguisher installed in the cabin			
	7) Fuel tank with corrosion protection 3 (three) years			

	8) Anti-vandalism filling cap, lock protected			
	9) At the front side towing/pushing pin			
	10) Noise emission level in accordance with Directive 92/97 EEC			
	11) Under run protection device on the left and right side of the truck chassis in compliance with EC directives			
	12) Set of standard tools provided			
	13) Over rear wheels mud guards or wheel arches			
	14) Two chocks for the tire mounted on the chassis			
	15) Vehicle to be colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b>			
	16) Side mirrors in truck is wide-angle mirrors electric adjustable and heatable.			
	17) At the right side added blind spot mirror – “ramp mirror”			
	18) Two orange rotary LED lights on the roof of the vehicle			
	19) Audible and visible warning in case vehicle is overloaded.			
<b>Superstructure</b>				
a. General	1) The dimensions and weights of the proposed chassis/superstructure shall be appropriate for satisfactory safety and stability. The bidder shall submit all relevant drawings and calculations including calculations of the distribution of the weight over the axles. The bidder shall present any required drawings/ calculations to show that the maximum weight (i.e. total dead weight + payload) is compatible with the truck specifications			
	2) Superstructure is on the counter chassis – reinforced profile			
	3) At the rear side hydraulic lifting device shall be suitable for collection of household waste and bulky waste and for handling standard wheel bins and containers capacity from 120 lit to 1.1 m <sup>3</sup> (EN – 840)			

	<p>4) Greasing points on all main bolts, main shafts of lifting device and hydraulic cylinders Main bolts must be reinforced and chromed or radial spherical plain bearings (G bearings) should be used for these support shafts/points</p>			
	5) Net capacity of body (i.e. not including the capacity of the hopper) is min 20 m <sup>3</sup>			
	6) Seal or type of construction between the loading compartment and the tailgate is required to prevent leakage or at the lower position under the tailgate it is waste water container to prevent any leakage between body and tailgate. Waste water container is with draining tap			
	7) Superstructure to be double layer colour coated according to Serbian standards (noticeable in all conditions). Colour to be <b>RAL 9010 pure white</b> (same colour as truck)			
b. Construction	1) In order to reduce wear and tear to the minimum and achieve a low weight, the superstructure floor to be made of high tensile, abrasion and corrosion resistant steel grades min. yield strength 1,250MPa (e.g. "HARDOX 450")			
	2) Continuous welding to be applied throughout the body to avoid the formation of rust			
	3) Noise insulation incorporated in the superstructure construction			
c. Compaction Mechanism	1) Compaction ratio is minimum 1:5			
	2) Electrically-controlled discontinuous cycle compaction system in accordance with standard EN 1501			
	3) Sliding plate has four (4) sliders			
d. Hopper/ Tailgate	1) Hopper capacity minimum 2.0 m <sup>3</sup> (Note: Capacity of the hopper is not included in the capacity of the RCV)			
	2) The base of the hopper to be minimum 8 mm made of high tensile, abrasion and corrosion resistant steel grades min. yield strength 1,250MPa (e.g. "HARDOX 450")			
	3) Automatic unlocking/locking when opening/closing the tailgate			
e. Hydraulics	1) Hydraulic reservoir with level meter			
	2) All hydraulic cylinders must be new not repaired			

	3) System equipped with filter with visual dirt indicator in return line			
	4) Double pump incorporated to enable independent operation of the compaction mechanism and the container loading device			
	5) Hydraulic cylinders with load-holding valve or hose burst valves provided on the hydraulic circuit that opens the tailgate in order to prevent a sudden drop of the tailgate			
f. Electrics	1) Voltage: 24 volts electrical system			
	2) Circuits protected from overvoltage with appropriate connections for use in hazardous environments, with fuses or automatic circuit breakers			
	3) In order to facilitate easy trouble shooting and repair, the electrical circuits to be provided with colour or number coding on the cable looms and wiring as well as on the various connector strips.			
	4) Wire will be with brass insulated cord electric wire end terminals			
	5) Light equipment in accordance Regulation ECE – R 48.01 and minimum IP55 standard is applied			
	6) Two working LED lights (reflectors) over the tailgate			
	7) One moving working LED light (reflector) fitted behind the vehicle			
	8) One orange rotary LED light on the left side roof of the superstructure			
	9) The necessary sensors - detectors for the electric devices-actuators in the superstructure should be connected through a programmable logic controller (PLC), in accordance with the European Standard EN 1501.			
g. Operation and Controls	1) Driver cabin equipped with main switch with warning light to stop all operation of superstructure for safety reasons			
	2) During lifting or emptying containers engine operates at optimum torque			
	3) Engine revs increase automatically to the optimum torque when superstructure operates			
	4) All functions electro-hydraulically controlled			

	5) All lifting operations via push buttons or levers			
	6) Function of controls to be clearly indicated either by text in Serbian language or internationally accepted symbols			
	7) “Hold to Run” type of controls			
	8) Emergency stop button in the driver’s cabin			
	9) Position of tailgate opening/closing control in accordance with EN 1501 standard			
h. Camera	1) The superstructure to be fitted with a camera at the rear of the vehicle with a LCD monitor in the cab			
<b>Loading Devices</b>				
a. Loading devices for standard waste containers, 1.1 m <sup>3</sup> capacity and 240-litre wheel bins	1) Lifting capacity is min 600 kg			
	2) Lift and loading device suitable for handling standard waste containers of 1.1 m <sup>3</sup> capacity conforming with DIN 30700 or EN 840 – 3 (i.e. with pick up at lateral trunnions via folding arms) and also standard 120-litre and 240-litre wheel bins			
	3) Lift devices in accordance with EN1501			
	4) Controls for the lifting and lowering movement are at both sides at rear side of vehicles			
	5) Two separate lifting and loading devices provided on each side (i.e. devices capable of operating separately to lift and load the standard 120-litre and 240-litre wheel bins and also operating together to lift and load the standard 1.1 m <sup>3</sup> waste containers			
	6) Loading height of rave rail in accordance standard EN 1501			
	7) Maximum cycle time (up and down) for handling of the containers of min. 15 seconds			
	8) Automatic lid opener incorporated in loading device for the waste containers of 1.1 m <sup>3</sup> capacity			
b. General	1) Foot stands (which are capable of being folded up) with hand grips provided at both sides at the rear of the vehicle in accordance with EN 1501 standard			
	2) Superstructure waterproofed to avoid any leakage during compaction and transportation			
<b>Additional Requirements</b>				

<b>Legal Requirements</b>				
a. General	1) The vehicle shall comply with the stipulated requirements of any relevant legislation pertaining in Serbia as well with any applicable Serbian or International (ISO) regulations and standards, where there are no Serbian standards.			
	2) The vehicle shall be suitable for operation in all climatic conditions on the Serbia territory			
<b>Documentation</b>				
Documentation	<p>The following documentation to be provided within delivery:</p> <ol style="list-style-type: none"> <li>1) User's operation manual</li> <li>2) Maintenance manual</li> <li>3) Service manual</li> <li>4) Spare part catalogues</li> <li>5) Homologation (Attest - certificate of compliance with the Serbian law and regulation)</li> <li>6) Original invoice</li> </ol>			
<b>Training for the end user staff</b>				
Short training course	1) One day on-site training (during delivery process) to be provided in vehicle driving and in regular operation and maintenance.			
	2) Training course to be in Serbian Language			
	3) Each trained worker will receive a certificate as a statement that the person is informed and awarded for the safety and secure usage of all systems installed on the vehicle.			

**After sales services for Lot no. 2**

<b>Specifications Required</b>		<b>Specifications Offered</b>	<b>Notes, remarks, ref to documentation</b>	<b>Evaluation Committee's notes YES/NO</b>
<b>Commercial warranty</b>	2 years (after the end of 1 year standard warranty in accordance with the conditions laid down in Article 32 of the General Conditions and Article 33 of the Special Conditions Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)			
<b>Response time</b>	On-site response time within 24 hours during 3 years after provisional acceptance Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)			
<b>Repair time</b>	72 hours repair time during 3 years after provisional acceptance Tenderer must provide a detailed description of the organisation of the proposed service (e.g. name of the authorised service provider)			

## Annex II + III: Technical Specifications + Technical Offer - part II – Place of delivery/Acceptance

Item	Nb of items for delivery	PUC responsible for provisional and final acceptance	Place of acceptance
Lot 2 - Supply of Refuse Collection Vehicles			
1) Refuse Collection Vehicle of 12 m <sup>3</sup> Capacity	1	1) JKP Komunalac, Čačak	Nikole Tesle 42, Čačak
	1	2) JKP Naš dom Požega	Zelena pijaca 7, Požega
	1	3) JKP Stari grad, Šabac	Dalmatinska bb, Šabac
2) Refuse Collection Vehicle of 16 m <sup>3</sup> Capacity	2	1) JKP Komunalac, Čačak	Nikole Tesle 42, Čačak
	1	2) JKP Zlatibor, Čajetina	Aleksandra Karađorđevića 65, Čajetina
	1	3) JKP Ivanjica, Ivanjica	Milinka Kušića 61, Ivanjica
	2	4) JKP Bioktoš, Užice	Heroja Luna 2, Užice
	1	5) JKP 12 Septembar Bajina Bašta	Svetosavska 6, Bajina Bašta
	2	6) JKP Stari grad, Šabac	Dalmatinska bb, Šabac
	1	7) JKP Komunalije, Sremska Mitrovica	Bul. Konstantina Velikog bb, Sremska Mitrovica
	2	8) JP Komunalac Pirot	Vojvode Mišića 50, Pirot
3) Refuse Collection Vehicle of 20 m <sup>3</sup> Capacity	1	1) JKP Elan Kosjerić	Nikole Tesle 1, Kosjerić
	1	2) JKP Komunalac Lučani	Jugoslovenske armije 5, Lučani
	1	3) JKP Komunalije, Sremska Mitrovica	Bul. Konstantina Velikog bb, Sremska Mitrovica
	1	4) JKP Bogatić	Mike Vitomirovića 4, Bogatić
	1	5) JKP Standard Šid	Ulica Svetog Save 80, Šid
	1	6) JP Komunalac Pirot	Vojvode Mišića 50, Pirot
	1	7) JKP Komnis Bela Palanka	Srpskih vladara 51, Bela Palanka
	1	8) JP Komunalac Dimitrovgrad	Balkanska 30, Dimitrovgrad
	1	9) JKP Komunalac Babušnica	7. juli 20, Babušnica
	2	10) JKP Higijena Pančevo	Cara Lazara 57, Pančevo