



100% electric
drive

**The Electric
Propulsion Expert**

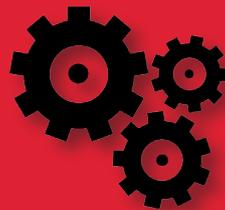
www.electromega.eu



Prototype **Scania P450**



80-150 km
range



200 kW
max. performance



80 km/h
top speed



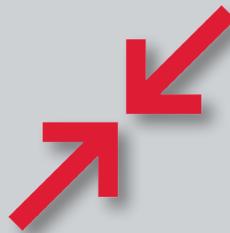
CHASSIS

Electromega Ltd. developed a heavy weight utility vehicle for waste collection with fully electric drive and compacting superstructure. We construct our fully electric garbage trucks on the chassis and superstructure of our customer's choice. We have initiated the serial production with a pilot series of 10 vehicles, and soon we will begin manufacturing the next three-axle garbage truck (26 tons).

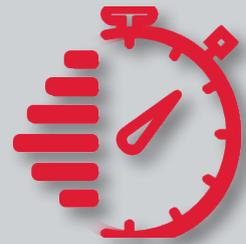
Superstructure Seres



15 m³
payload capacity



1:5
compression ratio



20-25 mp
compression

SUPERSTRUCTURE MANUFACTURER:

SERES machine industry
and commercial **LTD. PÉCS**



- HARD PRESS F 15-I container type
- SCANIA environment friendly, full electric drive
- Electric drive  **electromega**

SUPERSTRUCTURE

The hydraulics of the superstructure is 100% electrical. The electro-hydraulically powered superstructure is controlled by a microprocessor panel. The new elevator type S-K250 superstructure is compatible with the following standard bins (volume in litres): 2x110, 2x120, 2x360, 1x770, and 1x1100. The throw-in unit's cycle time is 8-15 seconds. Our fully electrical superstructure system is applicable to any upper body.

ELECTRIC DRIVE

Engine *Asynchronous Motor*

Performance *90 kW (max. 200 kW)*

Engine Torque *580 Nm (max. 1500 Nm)*

Average Consumption *700 Wh/km*

Top Speed *80 km/h*

Power Efficiency *maximum 94 %*



BATTERY

Type *LiFePO₄ - 103 kWh*

Charging Time *8 hour- 400V, 32A*

Battery lifespan *10 years*

CHARGER

Type *SDC700-10M*

Max. performance *10 kW*

Input voltage (tree) *380 VAC*

Output voltage *400-700 VDC*



VEHICLE CONTROL

Display Size *4,7", 15 cm*

Display *industrial, touchscreen*

Vehicle Control *unique control system developed by Electromega*



SERVICE

Compared to a combustion-engine driven truck the service requirements of our vehicle are only 30%. It has no exhaust, no catalyst or the associated sensors; there is no turbo, no fuel system of any kind, no clutch, no gearbox, etc. For example, the break system deterioration is 75% lower, due to the recharging solution we have in place. The maintenance implies considerably lower service fees, because the number of friction and heat release components is lower, therefore the engine lifetime is significantly prolonged, and general maintenance is never needed. By removing the gearshift from the truck we significantly reduced the wear, the consumption and the regular fault occurrences. Engine oil and filter changes are also unnecessary. The truck is driven by a simple power train; it has air conditioning and power steering. Due to the simplicity of our structure, the chances of failures are kept at a minimum.



ELECTROMEGA ELECTRIC Garbage Truck

TRADITIONAL DIESEL Garbage Truck



Zero Emissions
(CO₂=**0t**; CO=**0kg**; NO_x=**0kg**
yearly)



Greenhouse gases
(CO₂=**52t**; CO=**160kg**; NO_x=**380kg**
yearly)

100-120 kWh daily



60-80 liter gasoline

approx. 10 €/day



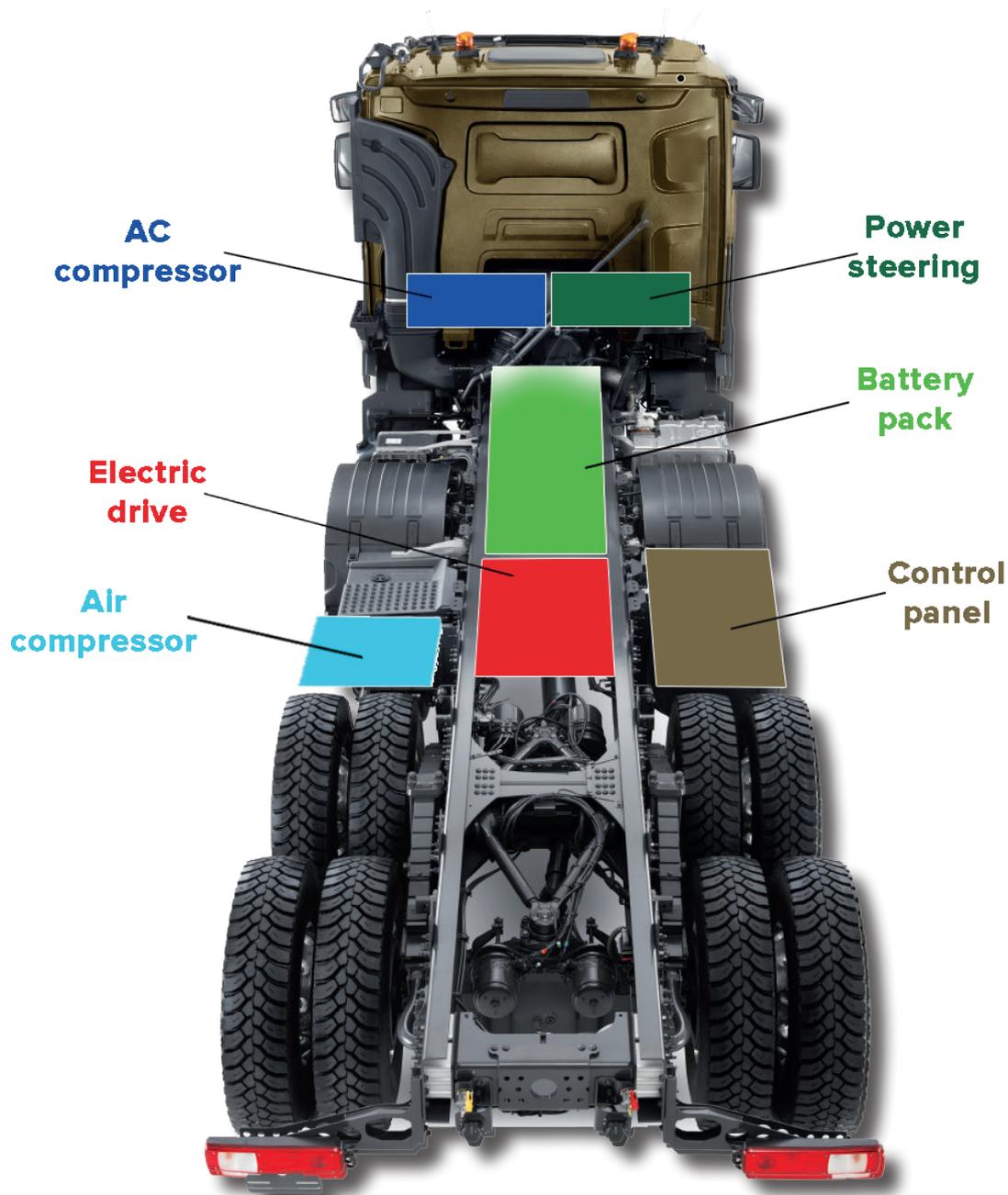
approx. 90-100 €/day

Lower operating noise during
maximum performance



Compared to our EV it generates
twice as much noise during
maximum performance

ELECTRIC PROPULSION EXPERT



The propulsion principle of our fully electric-powered garbage trucks is perfectly suited for heavy weight vehicles of all types and sizes. Furthermore, its electric drive system suits anything from passenger cars to 23 tonne trucks with versatile application possibilities, such as mini vans, garbage collecting vehicles, sweepers, trucks and buses.

APPLICATION



REFUSE TRUCK



MINI VAN



SWEEPER



TRUCK



BUS

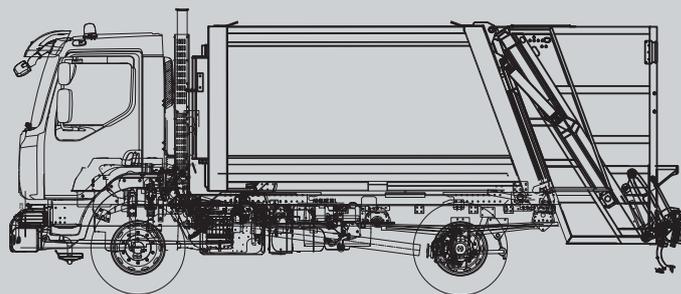


LORRY

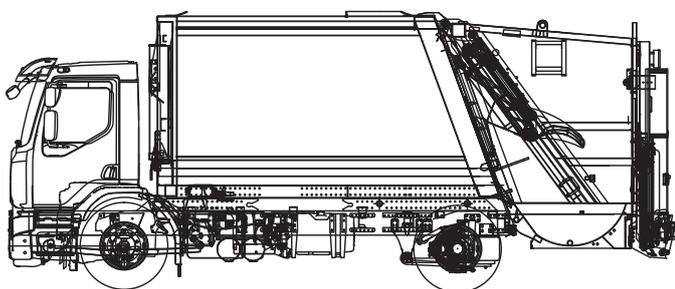
13 tonne (midi) electric waste collection vehicles for narrow streets and city centers

MIDI

We designed this truck for narrow streets in city centres that are hardly accessible by large waste collection trucks. It works in our closest surroundings without noise and any emissions. We recommend this model primarily for urban areas located at a short distance from waste depots, waste incinerators and/or processing sites.



URBAN



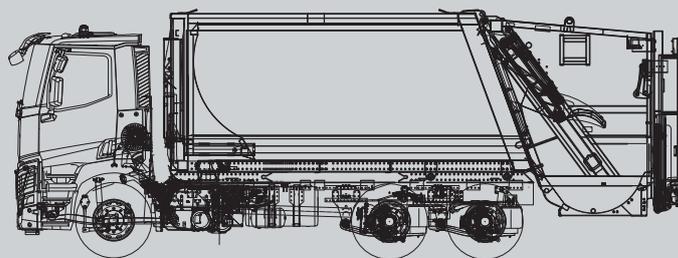
18 tonne (urban) electric waste collection vehicles for urban and residential areas

Urban waste collection is a key element of sustainable cleanliness, and we can perform the corresponding activities with a silent, modern and environment-friendly vehicle. We recommend this model primarily for urban areas located at a short distance from waste depots, waste incinerators and/or processing sites.

26 tonne (urban) electric waste collection vehicles for suburban areas

This is the ideal garbage collection vehicle for the refuse generated in urban and suburban residential areas. We recommend this model primarily for densely populated urban areas, and large apartment building zones.

MEGA



E-DRIVE

Electromega 12, 18 and 26 tonne electrified chassis with versatile application possibilities

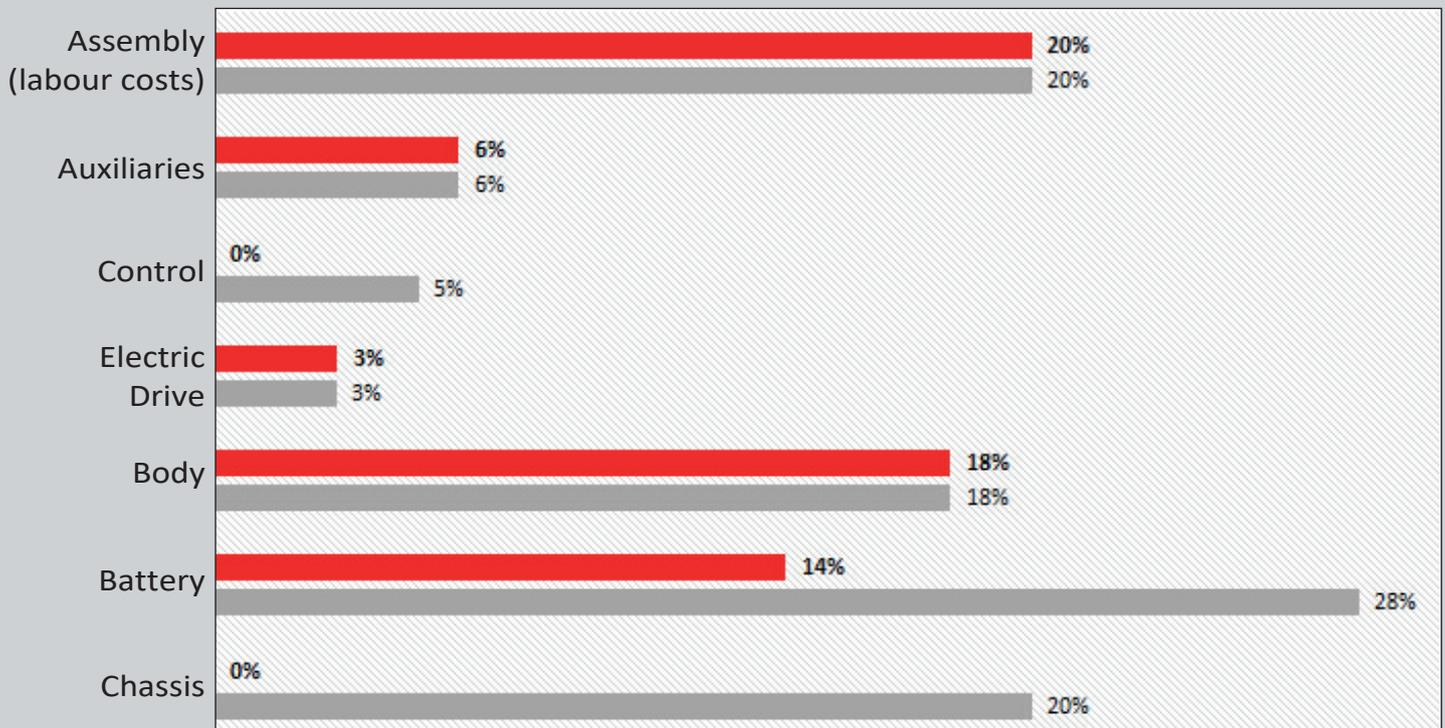
With the type-approved, fully electrically driven chassis end users may opt for the mounting of their preferred superstructure. These vehicles can also receive custom cargo load units, according to the requirements of the target application.



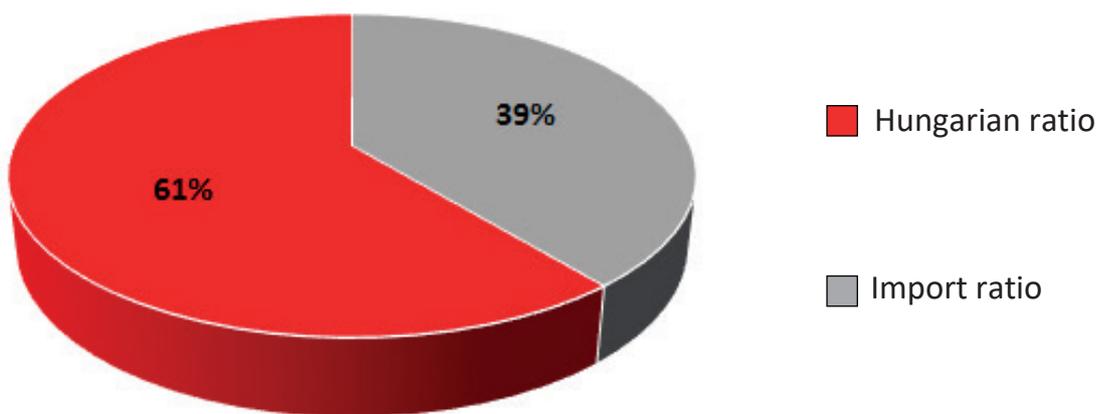
HUNGARIAN PRODUCT, HUNGARIAN PRODUCTION

Breakdown by components made in Hungary

■ Domestic percentage of given unit
 ■ Value of given unit relative to the overall budget



BREAKDOWN BY THE ORIGIN OF COMPONENTS OF THE ELECTROMEGA EV GARBAGE TRUCK



We plan on increasing the current 61%, because it is important for us to boost the ratio of Hungarian components in our developments as much as possible.

Electromega Ltd. was founded in 2009. Our Research and Development specializes in the heavy weight utility vehicles segment, and the manufacturing of FULL Electric-Powered Garbage Trucks. In the second half of 2014, in close cooperation with the Faculty of Engineering of the University of Debrecen we embarked on building our first 100% electric garbage truck. Today, Electromega Ltd. owns two environment-friendly, zero emissions, fully electric garbage trucks built by our own R&D engineering team, which are utilized in daily operation. Our research laboratory is located on the Daniella Industrial Park site, in an 800 m² assembly hall which can be extended to up to 4000m², if needed. Our production site infrastructure allows for the construction of 500 trucks per year, one third of which is intended for the Hungarian market and the rest for export. It is an important

priority for our company to support future research engineers in acquiring competitive knowledge, and to help them obtain real life work experience by the end of their studies, that open up further career opportunities for them. We closely collaborate with the University of Debrecen and other secondary schools as well, and within this framework students have the opportunity to follow the construction process of an innovative product. The reduction of costs and noise generated by the waste transportation fleets in the urban environment has become increasingly important for the European Union, the Hungarian Government and the communities as well. The silent garbage truck we offer today is a practical solution for the problem, since its operating and maintenance costs are significantly lower than that of the diesel trucks, these are much more silent and have zero emissions. Furthermore, by using EV garbage trucks

– we will be relieved of about 60,000 litres of refuse oil yearly.



**Profile:
Electric Propulsion
Research and Development**

**Group:
Daniella**

**Founded:
2009**

**2013-2014
Launching of the research
and development**

**2015 Spring
First EV test (Békéscsaba)**

**2016 Spring
Second EV test (Debrecen)**

**2016 September
Budapest: Normafa,
Istenhegyi út**

**2016 November
Smart City Expo - Barcelona**

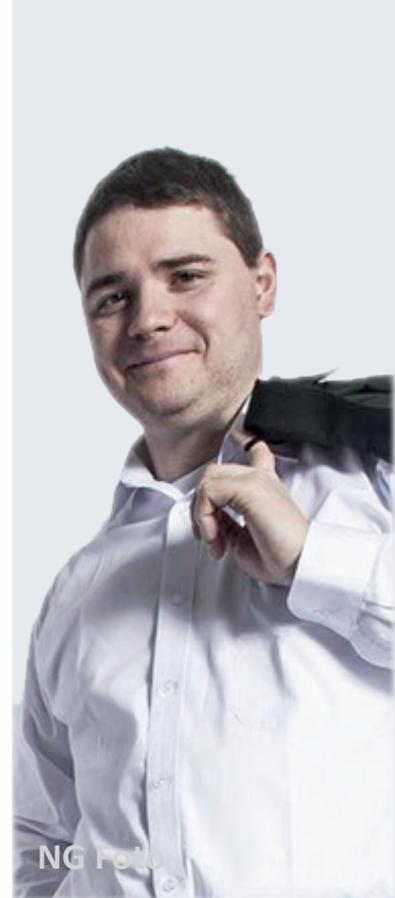


NG Foto



RESEARCH

Our researchers are Mr István Bartha, Master Professor, and Attila Vitéz, Professor at the Faculty of Engineering of the University of Debrecen, who have actively participated in building the first Hungarian fully electric garbage truck prototype. This fully electric garbage truck still performs daily without any serious issues, having operated in a more than 15,000 km range.



NG Foto



Electromega Ltd. is a member of the Jedlik Ányos cluster, established in 2014. The cluster aims to bring together those innovative companies that are able and committed to make a difference regarding electric propulsion, and actively support the corresponding efforts of the Hungarian Government, and also the spreading of the electric drive technology in Hungary.



UNIVERSITY OF DEBRECEN

According to the Agreement with the University of Debrecen, Electromega Ltd. owns this patent and the exclusive rights of use. Obviously we will continue to work closely with the Faculty of Engineering of the University of Debrecen regarding the further development of electric propulsion.

ELECTRIC GARBAGE TRUCK

We assemble the fully electric drive train on the chassis and body of our customer's choice.

- 13 tonne (midi) electric waste collection vehicles with 10 m³ bodies;
- 18 tonne (urban) electric waste collection vehicles with 15 m³ bodies;
- 26 tonne (mega) electric waste collection vehicles with 20 m³ bodies;
- 13, 18 and 26 tonne electrified chassis with versatile application possibilities.

Electric Drive Experts

VISION

The serial production plan volume is at least

450 electric garbage trucks / year

one third of which is intended for the
Hungarian market.

ELECTRIC TRUCKS

In the foreseeable future (in approx. 2 years) we plan on developing an electric-powered truck with an 800-1000 km driving range capacity for transportation companies.



POWERED BY  **electromega**

Electromega Ltd.

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HUNGARY

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