



European
Automobile
Manufacturers
Association

Charging of Electric Buses

ACEA Recommendations

May 2017

THE EUROPEAN BUS MARKET

The European Automobile Manufacturers' Association (ACEA) groups together the five main European bus manufacturers: Daimler, Iveco, MAN, Scania and Volvo. The market for electric buses is growing steadily day by day. Public transport authorities (PTAs) and bus operators are increasingly planning to purchase electric buses and, in some cases, it is even a mandatory requirement in tenders.

The ACEA bus manufacturers have a unique position in delivering all types of commercial vehicles to customers across Europe. It is in their customers' interest to have charging solutions limited to a number of pan-European standardised ones, allowing for interoperability to avoid lock-in effects and to increase efficiency.

CURRENT STANDARDISATION OF CHARGING INTERFACES

The European Commission has issued mandate M 533, requesting CEN/CENELEC to recommend a standard for the charging of electrical commercial vehicles before the end of 2019. Many stakeholders involved (including cities, transport operators, bus manufacturers and suppliers) believe this deadline is too far in the future given the current pace of market developments, especially with regard to electric buses.

Currently, many organisations are involved in the standardisation process, with stakeholders and individuals participating in several bodies and fora in parallel. A number of very important and high-level conferences, seminars and meetings will take place in the near future to discuss the future of electric buses. The UITP Summit in Montreal in May 2017 is one example of such an important occasion to discuss electric buses.

PRODUCTS ON THE MARKET

Today, there is a wide variety of electro mobility products available on the market. When it comes to buses, there are hybrid diesel, hybrid diesel plug-in (electric hybrids) and full electric buses. As for the charging of these buses, two different technologies exist at the moment, ie depot charging and/or opportunity charging – their application depending on the structure of the bus line (route length, speed, number of stops, topography, passenger

capacity and other parameters), choice of energy strategy, battery capacity/functionality, etc. From a technical point of view, the charging of buses can also be differentiated between so-called 'inductive' charging and 'conductive' charging.

INTEROPERABILITY

During the transition to electric buses, conflicts between several parallel and/or competing technical solutions should be avoided. From an efficiency standpoint, it should be possible to connect as many vehicles as possible to the same charging device and/or charging station. In a situation where different suppliers comply with the same standardised technology, cities and bus operators will have freedom of choice. Any recommendation should therefore take into account the international standards currently under development.

RECOMMENDATIONS¹ FOR CHARGING OF ELECTRIC BUSES

For depot charging:

- CCS Combo 2 device

For opportunity charging:

- Contact rails positioned on the roof of the vehicle above the front axle;
- Pantograph coming down from an overhead charging mast;
- Wi-Fi protocol for communication between vehicle and charging mast.

¹ ACEA supports these solutions, but this does not exclude the use of other solutions for the charging of electric buses.



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ABOUT ACEA

- ACEA represents the 15 Europe-based car, van, truck and bus manufacturers: BMW Group, DAF Trucks, Daimler, Fiat Chrysler Automobiles, Ford of Europe, Hyundai Motor Europe, Iveco, Jaguar Land Rover, Opel Group, PSA Group, Renault Group, Toyota Motor Europe, Volkswagen Group, Volvo Cars, and Volvo Group.
- More information can be found on www.acea.be or [@ACEA_eu](https://twitter.com/ACEA_eu).

ABOUT THE EU AUTOMOBILE INDUSTRY

- 12.2 million people - or 5.6% of the EU employed population - work in the sector.
- The 3.1 million jobs in automotive manufacturing represent 10.4% of EU manufacturing employment.
- Motor vehicles account for over €400 billion in tax contributions in the EU15.
- The sector is also a key driver of knowledge and innovation, representing Europe's largest private contributor to R&D, with €44.7 billion invested annually.
- The automobile industry generates a trade surplus of €100.4 billion for the EU.

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