

## 24 Oct 2017 AutoIntelligence | Headline Analysis

Air pollution, congestion, growing urban and suburban population and prospective diesel bans in cities are driving the development of electric buses. Several established and new OEMs venture are co-operating with suppliers and cities to offer clean transportation solutions.

IHS Markit perspective	
<b>Significance</b>	Busworld Kortrijk is the leading trade fair for buses taking place every two years.
<b>Implications</b>	Nearly all attending OEMs showcased a bus or coach with electric or alternative drive option and emphasised the need for clean transportation.
<b>Outlook</b>	Some manufacturers are clearly ahead in the electric game and have viable customer solutions in the market (e.g. BYD, VDL, Solaris) while others are either running or preparing customer trials. IHS Markit expects the start of series production for several manufacturers to take place in second half of 2018 and in 2019. However, also the demand for hybrid, gas and fuel cell buses will also increase over the next few years.

Busworld Kortrijk is the leading trade fair for buses taking place every two years. This year's edition is the last in Kortrijk (Belgium). With 367 exhibitors and 66 constructors on the 51,230-square-metre exhibition floor, the venue has now reached capacity. Therefore, the next Busworld will take place in 2019 in Brussels (Belgium).

## Electrification

The biggest topic on the show floor was electrification and many OEMs showcased their vehicles. Market leader in the electric bus space, China's **BYD** showed its first European-produced vehicle from its plant in Hungary. BYD is delivering in more than 20 European countries and has more than 25,000 electric buses on the roads around the world. BYD concentrates on overnight charging as the offered range is sufficient for their clients. BYD also undertook the global premiere of the 8.75 metre long electric Midibus with a range of 200 km and announced that it has received its first order for 21 units from Connexxion. Service of the vehicles will start in mid-2018 in North Holland (Netherlands).

Other Chinese manufacturers had vehicles on display including **Ankai** with its Big Bus Half Top, **Golden Dragon's** Pivot and **Higer's** Ultra Capacitor Bus. For the latter, a deal for 100 units was signed with operator Pandan from Israel during its press conference. **Kinglong** has also presented a 14-metre electric bus for zero-emission operation at airports around the world. **Yutong**, the world's largest bus maker, had two electric vehicles at its stand - one for city application that is doing trials in different French cities and an Intercity electric coach. Yutong has already delivered 12 units of this coach to Groupe SAVAC of Paris (France) and a further 40 are on order.

French manufacturer **Heuliez Bus** – part of CNH Industrial – partnered with Foresee Power for batteries and now offers a 12-metre (GX 337 ELEC) and an 18-metre (GX 437 ELEC) electric bus. The first customer will be the city of La Rochelle (France) at the beginning of 2018. A second order for Trondheim (Norway) is confirmed for the second half of 2019.

**Volvo Buses**, which has 3,600 hybrid units of its 7900 city bus in operation, displayed the electric version with pantograph or plug charging. Series production is expected to start in mid-2018.

Another hybrid pioneer is **Solaris** from Poland, whose electric buses are already on bus routes in Krakow (Poland) and Hamburg (Germany). In the past weeks and months, Solaris has secured orders from Germany (Nuremberg, Fürth), Italy (Bergamo, Milan), Norway (Oslo) and Poland (Warsaw, Krakow).



BYD Midibus

**Scania** showed an electric version of its Citywide LF bus. Six of these buses will run an extensive trial on a 14-km route in Östersund (Sweden) for four years. Departures will take place every 15 minutes, and buses will be charged via a pantograph in four to eight minutes by locally produced hydro power.

**VDL** from the Netherlands displayed its Citea E-Worker and confirmed that it will have 250 electric vehicles of different lengths on European roads by the end of 2017. 43 Citea articulated vehicles operate in Eindhoven (Netherlands), and will be followed by vehicles in Sweden and Germany.

**Ebusco** is another bus producer from the Netherlands that was showing vehicles. Since 2010, the company has produced 60 electric buses and its buses are in operation in Roskilde (Denmark), Munich (Germany), Utrecht (Netherlands), Stavanger (Norway) and Paris (France). Ebusco offers opportunity charging via pantograph at the end of the line or depot charging. Its electric bus has been tested under severe conditions in Finland, where it was subjected to extreme temperatures, and Norway, where it undertook gradient tests.

**Irizar** is a coach body builder that ventured into integral bus manufacturing several years ago and since 2014 has been developing electric buses. After customer trials in 2014 and 2015, Irizar started delivering units to Marseille (France), Bilbao (Spain) and San Sebastian (Spain) in 2016. In 2017, 26 12-metre electric buses will be delivered and production will start on the 18-metre articulated Irizar ie Tram that was unveiled at Busworld. The first unit will operate in San Sebastian and another 22 units have been ordered by Barcelona (Spain) and the Côte Basque-Adour conurbation in France from 2018.

**Mercedes-Benz** displayed only a Hybrid Citaro bus and **MAN** gave an update on its electric development. The unveiling of an electric bus from the latter should take place in March 2018 in Munich.

Smaller European companies that develop and market electric buses include **Mellor** from the UK, **Sileo** from Germany, **SOR** from Poland, **BMC** and **Temsa** from Turkey and **Vectia** from Spain.

## Other alternative drivelines

Besides electric buses, some manufacturers also showcased low-emission alternatives to diesel. Natural gas buses were on display from **BMC** (Procity CNG), **Iveco Bus** (Crossway LE NP), **Otokar** (Kent C CNG), **Scania** (Citywide LE CNG) or available for test drive (**MAN** Lion's City CNG). There were also hybrids and fuel cell buses.

## Entries to Continental Europe

Among the bus-makers looking to make inroads into Europe was the UK's **Alexander Dennis (ADL)** which is targeting the double-decker bus market outside the United Kingdom. Its first order is for 19 Enviro 500 three-axle double deck buses from PostAuto in Switzerland. Currently it produces around 2,500 buses and coaches per year and has a market share of 80% in London (UK). The brand also exports to Hong Kong, Malaysia, New Zealand, Canada, the US and Mexico. It was also announced that 45 Plaxton Elite i coaches have been delivered to the PolskiBus network.

## New coaches

In the coach segment, Busworld saw many premieres as well: the new **MAN** Lion's Coach, the **Setra** S531 DT double-decker vehicle, the new **Mercedes-Benz** Tourismo RHD high deck touring coach and several more.

## Outlook and implications

As noted above, growing urban and suburban populations alongside concerns over air quality and the prospect of diesel bans in cities are driving the development of electric buses. Most electric bus manufacturers are favouring either overnight/slow charging – mainly via a plug – or opportunity/fast charging through a pantograph or other method. The driving range offered varies from 160 km to 350 km using battery with a capacity of between 150 and 350 kilowatt hours (kWh). Several companies are also offering trolleybuses and this segment is seeing a revival with the Solaris Trollino, Iveco Bus Crealis and Van Hool Exqui.city. Trolley buses can be found in Linz (Austria), Geneva (Switzerland), Esslingen (Germany), Riga (Latvia) among other cities. Nevertheless, these have their own infrastructure-related costs. Overall, IHS Markit forecasts the market for electric buses to double in the next two years.

This edition of Busworld has also involved the broadest participation of Chinese bus manufacturers ever. Some have made their first appearance at the event this year (CRRC), while Kinglong for the seventh time. Nevertheless, this continues to underline that many of these manufacturers have plans to broaden their horizons outside their domestic markets.

On the coach front, the newest vehicles on display fulfil the new ECE R66.02 roll-over regulations. Furthermore, a change in weight legislation now gives manufacturers the opportunity to build a 13.0-13.5-metre coach more easily on two axles as the weight limit was raised to 19.5 tonnes. An axle less means reduced cost of maintenance and more luggage capacity for the same seating capacity as the previously allowed 13-metre coaches with three axles.

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MAN bus and Neoplan coach