Busworld Europe will be held in the Brussels Expo Centre from 18 to 23 October. It will be the largest bus and coach exhibition ever held in the world with over 500 exhibitors and 300 vehicles on display. There will also be many suppliers of components, services and all the other equipment that is necessary for the operation of a modern bus or coach fleet.

This will be the 25th edition of Busworld in Europe and the first time that the exhibition has moved from its traditional home in the small Flemish city of Kortrijk. We simply outgrew the halls in Kortrijk. Brussels will offer 44 per cent more floor space and will accommodate 511 exhibitors spread over nine halls.

The size of the exhibition can be measured in the five kilometres of carpet laid between and around all the stands. It is not only exhibitors who will require a stout pair of shoes but also visitors.

Busworld Europe will be easy to reach. There are regular bus services from the centre of Brussels. For those travelling by car, the Expo Centre is just off the motorway that runs right round the outside of the city.

There will be many world premieres and innovations at Busworld Europe. Product development is moving at a faster rate than at any time in the history of the industry, since the very first omnibus was launched in 1885. There have been previous landmarks like the first pneumatic...
tyres, the first diesel engines and the first all metal bodies, but nothing on the present scale. The industry is also more on the public and political agenda than at any previous time.

There is increasing concern about the environment and emissions in all the developed countries and that is having a major impact on city buses in particular. Although they are only a tiny percentage of the overall numbers of vehicles in circulation, they are highly visible because they work all day in urban areas. It is forecast that there will be rising numbers of people around the world moving to live and work in towns and cities and that will put further pressure on demand for clean air and minimal emissions.

Exhaust emissions have fallen dramatically in the last quarter century. The latest Euro VI emission standards have introduced engines which are very clean and with the added advantages of low noise levels and superior fuel consumption to previous generations of engines. European emission standards are also being adopted in many other parts of the world, usually a couple of stages behind Europe but nevertheless moving in the right direction on reduction in emissions.

Over the last ten years or so, hybrid buses have been introduced in Europe with a further saving of around 30 per cent in fuel consumption.

Some systems can be supplied with larger batteries so that they can operate solely on electric power for short distances in city centres.

Some industry experts predicted that hybrid buses would only be a step on the way towards full electric vehicles and it now appears that their forecast was correct.

At Busworld Europe there are bound to be many electric vehicles of all shapes and sizes. Some have relatively small batteries and require frequent charging during the day, usually at one or both ends of a route. However, larger cities have shown a preference for batteries which have sufficient energy for a full day’s operation, relying on overnight charging in a depot. It would also be impractical to have large numbers of charging gantries on city streets. Opportunity charging is an option in smaller urban areas where there are fewer routes.

Batteries that are capable of a full day’s service are inevitably much heavier and bring buses close to maximum permitted legal weights when full of passengers. However, battery technology is improving all the time so that they have greater energy density and therefore less weight. It is even possible to have articulated buses that can run for a full day with overnight charging.

Looking at European registration statistics, demand for hybrid buses is falling but more electric buses are entering service. Forward orders for electric buses are rising, with major cities setting targets to have all buses running on zero emission energy by dates like 2030.

By far the largest numbers of electric buses are running in China, making a major contribution to cleaner air in cities. Chinese manufacturers like BYD and Yutong have developed electric buses that meet European legislation and customer requirements.

All the main European manufacturers have also developed electric buses, some later than others. The challenge now is to bring other parties on board, such as city authorities and the suppliers of electricity. Some cities even want to ensure that the production of electricity is emis-
Electric buses have been introduced in Europe with a further saving in emissions. Over the last ten years or so, hybrid buses have been introduced, combining the advantages of low noise levels and superior fuel consumption to previous generations of engines. European emission standards are also improving all the time so that they have become more stringent. Excess emissions have fallen dramatically in cities, ensuring on demand for clean air and minimal emissions.

Governments, particularly European ones, are extremely clean.

Exhaust emissions have fallen dramatically in cities, ensuring on demand for clean air and minimal emissions. There is a significant and rising demand for electric buses in many European cities, with distinctive electric coaches which have sufficient energy for a full day's operation, relying on overnight charging in a depot.

The new electric Mercedes-Benz Citaro is full of passengers. However, battery technology is still at an early stage, with many cities entering the market at one or both ends of a route. However, larger buses would only be a step on the way towards larger numbers of electric buses. The industry is also more on the public agenda than at any previous time.

The component industry has also met the challenge of moving to electric vehicles, for instance on heating, ventilation and air conditioning. Depending on the time of year, they can impose a heavy load on batteries but there are some innovative systems that will be seen in Busworld Europe. The component industry has also met the challenge of moving to electric vehicles, for instance on heating, ventilation and air conditioning. Depending on the time of year, they can impose a heavy load on batteries but there are some innovative systems that will be seen in Busworld Europe.

The initial purchase price of electric buses is substantially higher than diesel buses, but there should be some payback in the lower price of off-peak electricity and in reduced maintenance costs. It is reckoned that electric motors will last the lifetime of the bus. Even so, if electric buses are to be introduced in high volume, they may well require subsidies from central or local Governments.

There is some demand for buses fuelled by compressed natural gas because the emissions are lower than those from diesel engines, but against that is the weight and cost of gas tanks carried at roof level and the necessary refuelling facilities at a depot. There is also some demand for engines that can run on biogas produced from waste sources like sewage. That is a renewable source of energy and a win-win situation for a city because it helps to use a product that is normally unwanted.

The general view is that diesel will remain the preferred fuel for interurban buses and for coaches of all kinds. The latter can travel anywhere and recharging is a real problem. There is simply not a network of stations where, for example, a coach on an extended tour can recharge each night, for instance at a hotel. Furthermore, the weight of batteries, and the space that they require, will restrict available capacity for the luggage of passengers.

However, there are limited applications for electric coaches and these will be seen at Busworld Europe. Check the stand of Van Hool. Electric coaches are suitable for regular services such as staff transport on routes between their homes and workplace. They are also suitable for shorter distance operation in cities. As the numbers of electric cars increase, customers might well expect to be carried on electric coaches!

Fuel cells are another zero emission solution and will be seen in Busworld Europe. They can be used either in a hybrid drive supplying energy to batteries and from there to electric motors or they can be smaller units but act as range extenders, normally giving a boost of power when a bus restarts from a stop. Fuel cells are still expensive, but the price is coming down and the costs of research and development can be shared with cars, vans and trucks.

It will be impossible to get around Busworld Europe in one day. We recommend a minimum of two days to get up to date and see all the new products and services. Use the services of our hotel partner, Brussels Booking Desk. They still have rooms available in various price ranges.

We look forward to welcoming you to our new home in Brussels and hope that you have a successful and enjoyable time at Busworld Europe.
Autonomous buses face hurdles

A number of manufacturers have launched small autonomous vehicles seating around 8 passengers, but Alexander Dennis, Iveco and Mercedes-Benz have produced and demonstrated full size autonomous buses. Those by the first two manufacturers were developed primarily for use within bus depots, going through refuelling, washing and parking procedures. It has been found that autonomous buses can be parked more closely together making better use of depot space and eliminating the risk of minor damage.

Mercedes-Benz demonstrated its autonomous Citaro to the press on a busway close to Amsterdam Airport. It ran on quite a long route and had the ability to park around 40mm from the raised platform of each bus stop, enabling passengers to get on and off quickly and easily. It was particularly useful for passengers with luggage or disabilities.

Alexander Dennis and Stagecoach are planning to introduce five autonomous buses next year to run on a service which will link a park and ride site in West Fife, Scotland, with a similar site on the western side of Edinburgh. The original Forth Road Bridge has been replaced by a new structure but remains open for buses and taxis. This enables them to avoid any congestion and thereby reduce journey times.

Vehicle developments have run ahead of legislation. Whenever autonomous buses are used on public roads they must have a driver in attendance, even though he or she does not have to do any work.

Operators in most developed countries are facing a challenge with the average age of drivers rising and, in some countries, difficulties in recruiting younger people for bus and coach driving. Therefore autonomous buses could be a great benefit if they could operate without any driver on board. This will require changes in legislation and acceptance by insurance companies. There will inevitably also be resistance by passengers until they gain confidence in autonomous buses. Payment for journeys will have to be made off-bus and that is becoming simpler with the widespread use of contactless credit/debit cards.

Autonomous buses are both a challenge and a potential benefit for the operating industry.

INTERNATIONAL BUS CONFERENCE

UITP, the International Union of Public Transport, and the Busworld Academy are organising a conference during Busworld from 21 to 23 October. UITP is the only international organisation that represents the interests of bus, tram and metro systems and has its headquarters in Brussels.

The conference is described by UITP as “The ideal place to learn about the major trends and developments in the bus and trolleybus sector”.

The conference will bring together an impressive selection of speakers from a wide variety of public transport operators to talk about their systems, experiences, best practises and case studies. The conference is therefore the ideal event for learning about what is happening in the industry.

Attendance at the conference will give delegates opportunities to meet suppliers, operators and public authorities from around the world. There will also be the opportunity to visit the Busworld exhibition. Entry is included in the conference pass that can be obtained on the UITP website – www.uitp.org –.

You can also visit www.busconference.com to view the programme and see the lists of speakers and participating companies.
The entry list for the Bus Awards is absolutely fascinating. There are ten electric buses and one each powered by CNG, hybrid gas and a fuel cell. There is not one diesel bus, an amazing reflection on how the manufacturing industry is responding to demand for ultra low or zero tailpipe emissions.

Diesel will power six of the Coach Award contenders along with one Iveco CNG coach and one Yutong intercity electric coach. All these vehicles, buses and coaches, must have valid licence plates to be tested on public roads and will then be available to view on the stands of their manufacturers during Busworld Europe. There are several world premieres among them.

The vehicles will be thoroughly tested by jurors, both on the road and in static positions. They will look for a whole variety of features including safety and comfort for drivers, couriers and passengers, ride and handling, ease of entry and exit, seating and at-seat facilities, interior lighting, heating and air conditioning and interior noise levels. There will be four Busworld Awards Labels each for Bus and Coach: for Safety, Comfort and Ergonomics, Ecology, and Styling and Design. There can be a maximum of eight Awards but the jurors can withhold any Award if they feel that there is no vehicle qualifying for it.

There are also Awards for Innovations in Components and a large number of registration forms were submitted. These were evaluated by a jury to select the most innovative products to go forward for judging for the Innovations Awards. Components must be new and not improvements to existing designs.

All the Awards will be published and will be displayed during Busworld Europe by the proud winners.
RECHARGING INFRASTRUCTURE

The Association of European Automobile Manufacturers, Eurelectric and Transport & Environment recently issued a joint statement calling for the rapid introduction of intelligent charging infrastructure for electric vehicles.

Kristian Ruby, Secretary General of Eurelectric said that there was a requirement for 1.2 million public charging stations in Europe by 2025.

The partners said that policy makers and legislators should make charging of electric vehicles at base, at work and along motorways and other trunk roads as easy as possible. This will require a massive expansion of the strategically located infrastructure for intelligent charging throughout the EU.

The partners said: “Thanks to an intelligent infrastructure, drivers can charge without seriously affecting or overloading European electricity grids. This will offer clear benefits for customers, the electricity system, the automotive industry and society as a whole.”

KONVEKTA TURNS UP THE HEAT

Konvekta AG, a leading manufacturer of heating, ventilation and air conditioning systems has developed a fast-charging enabled, modular, heat storage system for electric city buses, called HEAT2GO. The company says that it sets new benchmarks in terms of energy saving and emission free heating.

More than one hour of continuous heat with a capacity of 10kWh is available to electric buses and this is without having to put any burden on the batteries. HEAT2GO is a heat pump operated with the refrigerant CO₂, providing ecological benefits for both operators and the environment.

HEAT2GO was developed in a joint venture with the renowned Fraunhofer Institute for Traffic and Infrastructure. The system can be recharged, along with the batteries of the bus either in the depot or by opportunity charging. Konvekta says that the service life of the latent heat storage is theoretically unlimited. The system can be seen in Hall 5 on stand 516a.

Principle of the Konvekta CO₂ heat pump

25 % operating power

75 % ambient heat + energy collect

100 % thermal heat

Van HOOL NOVELTY

The Van Hool stand is always busy at Busworld and this year promises to be no different. One of the exhibits will be an Exqui.City articulated tram-bus powered by a fuel cell. It is one of eight for the French city of Pau.

The fuel cell converts hydrogen and oxygen into electrical energy through reverse electrolysis. The electricity is used to power the vehicle while unused energy is stored in lithium batteries to provide additional power where and when needed, for instance pulling away from a stop.

Van Hool says that a full Bus Rapid Transit system has never before been built with hydrogen powered single articulated trambuses. The vehicles for Pau have a range of around 300km and can be fully refuelled in ten minutes. Therefore they offer bus companies the highest level of operational flexibility and productivity. You can find Van Hool in Hall 5.

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