



Clean air transport has arrived.

CNG buses from MAN

MANecocity.





MANecocity.



MAN EcoCity. The cleaner route.

EcoCity buses from MAN represent a quiet revolution in public road transport. Fuelled by Compressed Natural Gas (CNG), the advent of cleaner, greener, quieter, safer and cheaper-to-run buses brings a whole new package of benefits to bus operators in the UK.

The benefits go beyond the purely environmental, important though these are. In today's world of tightening budgets and an uncertain economic outlook, MAN EcoCity buses deliver highly attractive financial and operational advantages too.

As global leaders in road transport, MAN has already supplied more than 3,000 CNG buses that now operate throughout the world. The numbers are growing rapidly, as more and more bus operators embrace the attractive proposition of CNG over diesel.

- Clean
- Green
- Safe
- Lower emissions
- Lower fuel consumption
- Lower operating costs
- Dedicated after-sales support

MAN EcoCity.

Fuelling business efficiency.

Quiet, green and clean

Gas engines are significantly quieter than diesel engines, an important benefit for urban bus operations. For both driver and passenger, the CNG bus runs much more quietly, there is less vibration and, not least, there is no smell of fuel.

These factors are equally significant for the general public, including pedestrians, other road users and residents living along bus routes.

In terms of emissions, mono-fuel gas engines are cleaner than comparable diesel or dual-fuel engines. They achieve EEV emission standards without the use of chemical additives in the exhaust system. What's more, gas engines do not require particulate traps. What the public most notice is that gas engine exhaust emissions do not have the pungent smell associated with diesel engine exhaust.

MAN EcoCity buses run on readily available gas from the national grid, after treatment and compression to 200 Bar pressure. But they can also operate on renewable and sustainable Bio-Gas (often called Bio-Methane) without modification. When Compressed Bio-Gas (CBG) becomes widely available as a fuel, CO₂ emissions can be claimed to be minimal, as CBG is a renewable fuel using organic waste feedstock that would have decayed and produced CO₂ in any event.

Another useful feature is that there is no longer any need for a large inventory of hydrocarbon fuel to be stored at vehicle depots. Gas fuel does not need to be bunkered. It is simply drawn from the distribution system as required, with a minimum amount of storage at the filling point. The 'green' case is enhanced with the elimination of risk of oil spillage and resultant environmental cleanup. With fuel oil deliveries no longer required, the use of HGV transport is also reduced.

Low Carbon Emission Bus (LCEB) incentives

When it comes to the financials, MAN EcoCity buses offer a highly attractive proposition. Put simply, CNG buses generate lower running costs than diesel buses.

The cost of supplying CNG fuel is linked to the quantity consumed daily at the fuelling point. Large economies of

scale apply to both the operation of CNG equipment and the purchase of gas supply. The more gas used per day, the lower the cost of supply. When an economic size of operation is established, the following benefits accrue:

- The unit cost of CNG can be held stable over an annually contracted period.
- A fixed lower price differential can be maintained compared with diesel.
- CNG and CBG are 100% rebated with the Bus Service Operators Grant (BSOG).
- A Low Carbon Emission Bus currently attracts an additional 6p per kilometre incentive, which further strengthens the case for switching to CNG.

Supplementary benefits include the fact that CNG does not need to be stored, so there are no costs of operating a fuel storage facility. With CNG paid for monthly in arrears, no capital is tied up in stored fuel. The risk of fuel pilferage is also eliminated from both storage areas and vehicles.

With no spillage clean-up costs to take into account, there is potential to reduce property and liability insurance costs. CNG bus operators can also factor in a possible additional revenue stream through offering third-party access to CNG refuelling facilities.





A safer operation

In all key respects, a gas bus is considerably safer than a conventional diesel bus. The fuel tanks (cylinders) used for CNG are constructed to the highest international standards with a comprehensive fit of protective devices, and they are tested to very high pressures.

With CNG, the risk of fuel leaks is very low. Crucially, it doesn't form pools of inflammable liquid, a major safety feature in the event of traffic accidents. Being lighter than air, any leak disperses very quickly.

CNG is difficult to set alight compared with conventional fuels. Self-ignition temperature is around 640°C, as opposed

to 210°C for diesel and 246°C for petrol. All CNG fuel installations are subject to strict construction and inspection regulations, including a Risk Assessment and Hazard Operability Analysis for each individual installation.

With the conversion to CNG bus operations, changes to maintenance workshop practices are minimal and largely procedural, and would be included in staff training. Workshop modifications are limited to the removal of any naked flame space heaters above the gas bus maintenance area, and ensuring that there is adequate roof ventilation. A gas detector is also required to be fitted at the highest ventilation point.

MAN EcoCity. The future for bus travel.



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The on-board gas system

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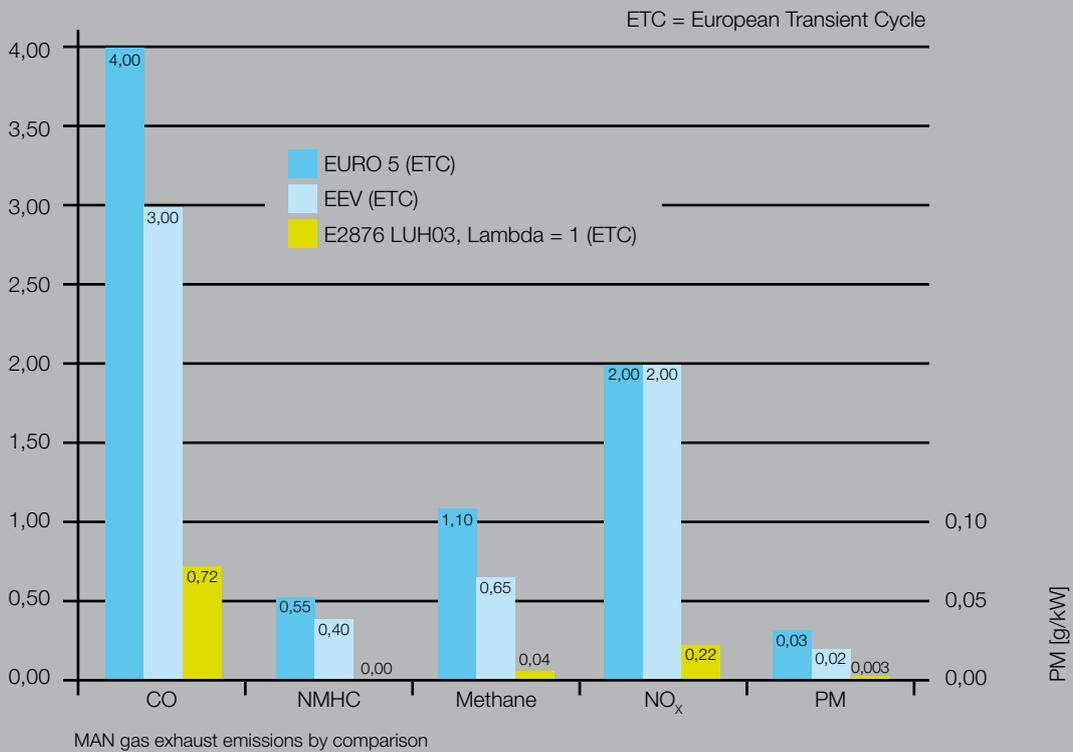
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The 6-cylinder natural gas engine

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MAN EcoCity. A new way of thinking.

Infrastructure

The CNG fuelling infrastructure in the UK is in its infancy, but MAN Bus UK has secured the services of the Gas Bus Alliance, who bring their unique expertise in gas vehicle operations going back more than 20 years to assist the introduction of gas fuelled buses in the UK.

The Gas Bus Alliance is an association of the most experienced gas vehicle industry personnel in the UK. Their knowledge encompasses the development of gas fuelled engines, the design, construction and operation of CNG filling stations, and the provision of operational support to large fleets of gas fuelled HGVs. They also have a detailed understanding of and contacts within the UK natural gas and bio-gas markets.

Fuel supply

With no need for large stocks of fuel to be managed and stored in the bus depot, gas is drawn from the national grid as required for CNG bus operations. Importantly, the supply of CNG is secure, it is not dependent on road transport for delivery, and it is always immediately available.

Refuelling is carried out in two ways, to suit operational needs:

- Slow fill: At the end of the working shift, the driver hooks up to a fuel line and the fuel cylinders are slowly refilled overnight in a continuous unattended process – with auto shut-off – ready for use the next day.
- Fast fill: This is similar to filling up at a service station and takes about the same time to complete – around five minutes.

Bus refuelling locations remain clean and odour free – a great advantage to operators, drivers and the wider environment.









MAN EcoCity. A fresh approach.

Customer support

MAN, in cooperation with the Gas Bus Alliance, is committed to delivering Total Customer Support to EcoCity bus operators. This extends from the initial discussion of requirements to comprehensive customer care throughout the operational life of a contract.

The full support package includes:

- Design and supply of CNG fuelling stations, including Hazard Analysis and Hazard Operability Studies.
- Training fleet operator staff at all levels in the Health and Safety aspects of CNG.
- Training fleet operator staff in the use and maintenance of CNG vehicles – incorporating driver retraining as appropriate for CNG buses and driver training exercises to promote low fuel consumption.
- Monthly meetings with operator staff during the initial start-up stage to address any matters arising, invaluable in familiarising CNG bus operators with the new vehicles and the refuelling system.

The next steps

The case for MAN EcoCity buses is clear. Offering unparalleled environmental, operational and financial benefits to the bus operator, this is the future of on-road public transport in the UK.

To find out more, simply contact MAN Bus UK for an initial discussion of business requirements and opportunities.

On request, demonstrations of the MAN EcoCity bus in operation can be given, facilitated by fuel supplies arranged by the Gas Bus Alliance.



Interested?

www.mantruckandbus.com

Or email your enquiry to:

sales-bus@man.co.uk

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