

# Green hydrogen for bus fleets

H<sub>2</sub> as the key to clean and economical public transport



## Next stop: Climate-neutral City Centers

Many experts agree that green hydrogen - also called clean or renewable hydrogen - plays a key role in achieving climate neutrality. This goal, which more and more countries are striving to achieve with concrete measures and timeframes, requires commitment in many areas. One of them: public transport or, more precisely, municipal bus fleets.

### Reaching the destination emission-free

The biggest advantage of fuel cell electric buses (FCEBs) is certainly that they emit no climate-damaging emissions, unlike conventional buses equipped with diesel engines. This is good for the environment, good for the people in the inner cities, and may soon be a „must“ as more and more cities decide to become completely emission-free.



Test drive of a fuel cell-powered bus in Tarragona, Spain.

### Safety has the right of way

As an industrial gas specialist, Messer masters the safe production of hydrogen, the associated quality assurance, filling technology, logistics and the supply of bus fleets. Since 2011, we have been the technology and hydrogen supplier for one of the largest FCEB fleets in the USA. Optimized solutions for safe, reliable and cost-efficient refueling of FCEB are among our strengths.

### Reliability as a roadmap

To ensure that passengers reach their destinations on time, buses have to run reliably. Here, too, FCEBs are in no way inferior to their conventional alternatives. This also applies to refueling: the duration of refueling with hydrogen is on a par with refueling with diesel fuel. Messer was able to demonstrate this impressively in the USA: within 3.5 hours, 30 FCEBs were refueled with hydrogen. This corresponds to an average refueling time of 6.5 minutes.

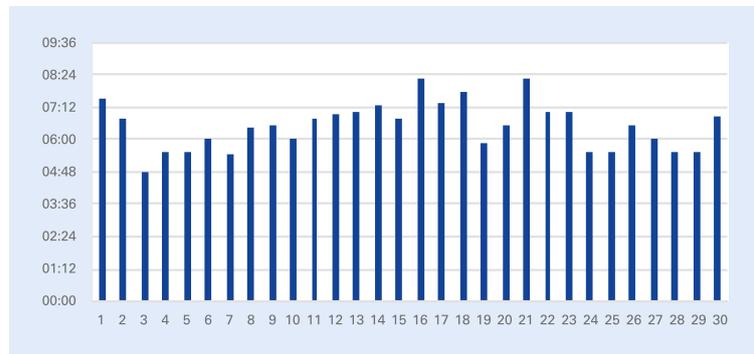
### The best way is called „One-Stop-Shop“

For sustainable mobility, Messer is working with the Toyota Group to offer a comprehensive solution for hydrogen-powered buses - including hydro generators and all the services required for operation: the „One-Stop-Shop“.

As part of the „One-Stop-Shop“, you receive vehicles, financing, hydrogen and technical service from a single source. Payment is made per kilometer driven or per kilogram of hydrogen consumed. This gives you the

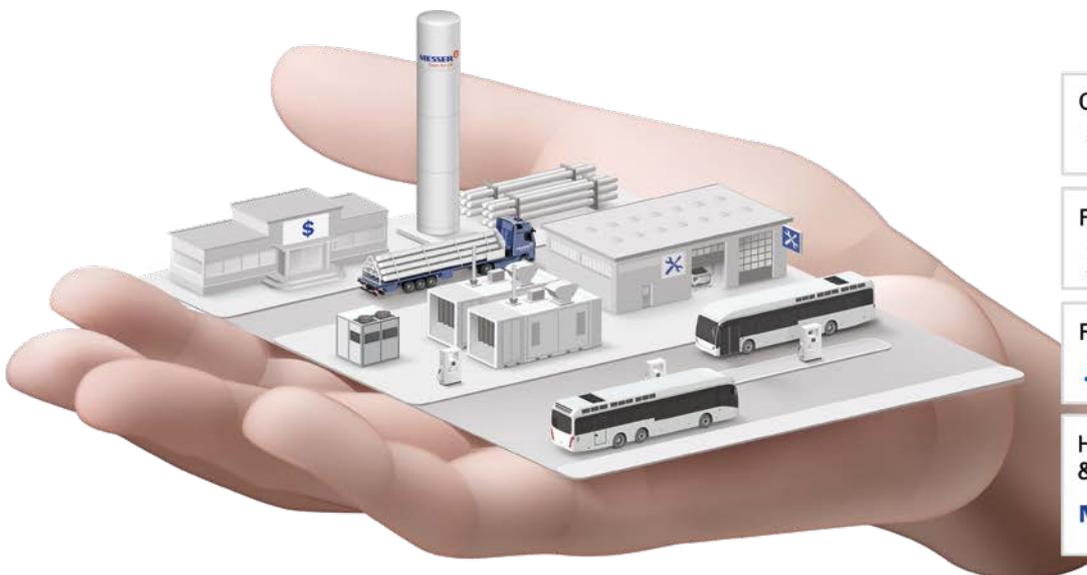


Messer has many years of experience in supplying bus fleets with hydrogen.



30 back to back fueling events in a time window of 6.5 hours

security of predictable total cost of ownership (TCO). So you can concentrate fully on your core business, while the „One-Stop-Shop“ ensures that the operation of your hydrogen-fueled FCEB is as safe, reliable and economical as possible.



- Capital**
- Fuel-Cell Electric Vehicles**
- Fleet services**
- Hydrogen supplies & filling infrastructure**



## Your advantages at a glance

- Environmentally friendly, future-proof solution for bus fleets
- No impending levies for the operation of internal combustion engines
- Highest possible safety and reliability in FCEB operation
- Years of experience with hydrogen
- High degree of practicality, e.g. due to short refueling processes
- Transparent, predictable cost of ownership (TCO)
- All necessary components from a single source

### Find the best solution together

Take advantage of the experience of our application specialists. We will be happy to show you how to realize your FCEB fleet in the best possible way.

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