

WSW Wuppertaler Stadtwerke, Germany

Start of operation	Number of buses	Type of bus	Type of fuel cell
2019/20	10	A330 FC VanHool	FCveloCity®-HD85 (85kW)
2021/22	10	Solaris Urbino 12 hydrogen	FCmove®-HD (70kW)
2025	32	Solaris Urbino 12 hydrogen	FCmove®-HD (70kW)

2.2 Mio kilometers driven

170 t of hydrogen used

Challenges and Lessons Learned

- Hydrogen remains more expensive than diesel on a per km basis
- HRS optimization (local electrolyze) could significantly reduce costs
- Without subsidies the acquisition costs of FCEB remain higher than those of normal Diesel buses
- Common issues:
 - occational delays in spare part deliveries, particularly hydrogen-related components
 - reliance on supplier for parts and technical support led to prolonged vehicle downtimes
 - supplier struggled to offer fixed prices for kg H2 due to electricity fluctuations.
- Passing risk to customer (high energy costs = high H2 prices)
- Regulatory uncertain (energy sector + hydrogen)



Best practices

- integration of FCEB data monitoring proven essential
- Monitoring and analytics of the lifespan an degradation of the hydrogen-specific components to identify wear patterns and optimize maintenance cycle
- realistic assessment of drivetrain performance based on actual operational use cases ensuring that technical specifications (e.g. in the tender documents), ensuring long-term reliability and transparency in performance expectations
- Clear after-sales requirements (max. delivery time for spare parts, defined repair timeframes, specified communication channels for technical support and issue resolution)