

Key takeaways



1. ZEB are essential to ensure climate targets and address air pollution in cities

- Policy framework is clear
- European cities and bus operators committed to reduce emissions

2. Shared key aspects to consider when deploying ZEBs

- System approach: Vehicle-HRS-Maintenance
 - Depot adaptations incl. safety regulations and deployment, staff trainings (drivers, technicians, etc.)
 - Innovative approach like HRS in bus depot in Bolzano for growing fleets
- Holistic view and long-term planning to ensure investments are sustainable and bus service is guaranteed: “Think big”
- Local context and operational conditions solve almost all questions when it comes to technology choice
 - Dijon: ambition to full conversion of 200 vehicles into fuel cell hydrogen
 - (green) H₂ as by-product is an advantage (Cologne region – RVK fleet)



FC technology is ready to take the challenge

- FCHB are not a prototypes anymore and technology is progressing well
 - Main KPIs proved technological maturity (decreased fuel consumption, downtime, vehicle price)
 - Early JIVE performance results show 7-10kg/H₂ per 100km on bus side, 95% availability on HRS
- Upcoming: intercity routes with longer distances and higher commercial speed ideal as next demo pilots.
 - Buses and coaches are different when it comes to refuelling regime
- Industry is ready to match the demand as cities are increasing their commitment to ZE



Challenges ahead...

- Standardisation of HRS and permitting
- Lack of refuelling infrastructure
- Energy mix and state of the grid key to decide
 - Carbon footprint of H₂ sources/supply
- TCO still higher
 - Price: 7-8 EUR/kg green H₂; 5 EUR/kg needed to be cost competitive with BEB
 - 4-5 years to achieve parity with BEB
- FCHB still have a battery (fuel cell stack) that requires close monitoring and maintenance
- IT software key for efficient operation and maintenance



To conclude...



- Knowledge exchange key to facilitate capacity building and create trust in the technology

www.cleanbusplatform.eu

<https://www.fuelcellbuses.eu/projects/jive>

- Exciting 5 years ahead to see how FCB consolidate as ZE technology!
 - From a more funding model to a more commercial model as fuel cell price decreases

