

DAIMLERCHRYSLER

CUTE and HyFLEET:CUTE: Two Major Bus Activities – A Major Step towards Cleaner Urban Transport

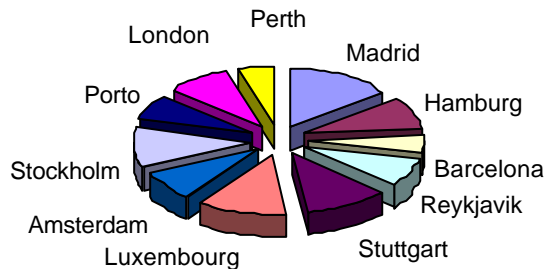
**Brussels,
Jan. 25th, 2004**

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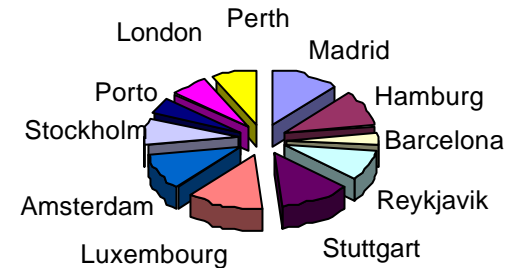
Performance of the Fuel Cell Buses

- In total the 33 Fuel Cell Buses accumulated about **1.080.000 km** (varies from 35.000km to 140.000km per site)
- The operating hours account so far to about **76.000 hrs** (varies from 1200h to 3000h per bus)
- On a day with an average availability of bus and infrastructure the buses carry up to 10.000 passengers

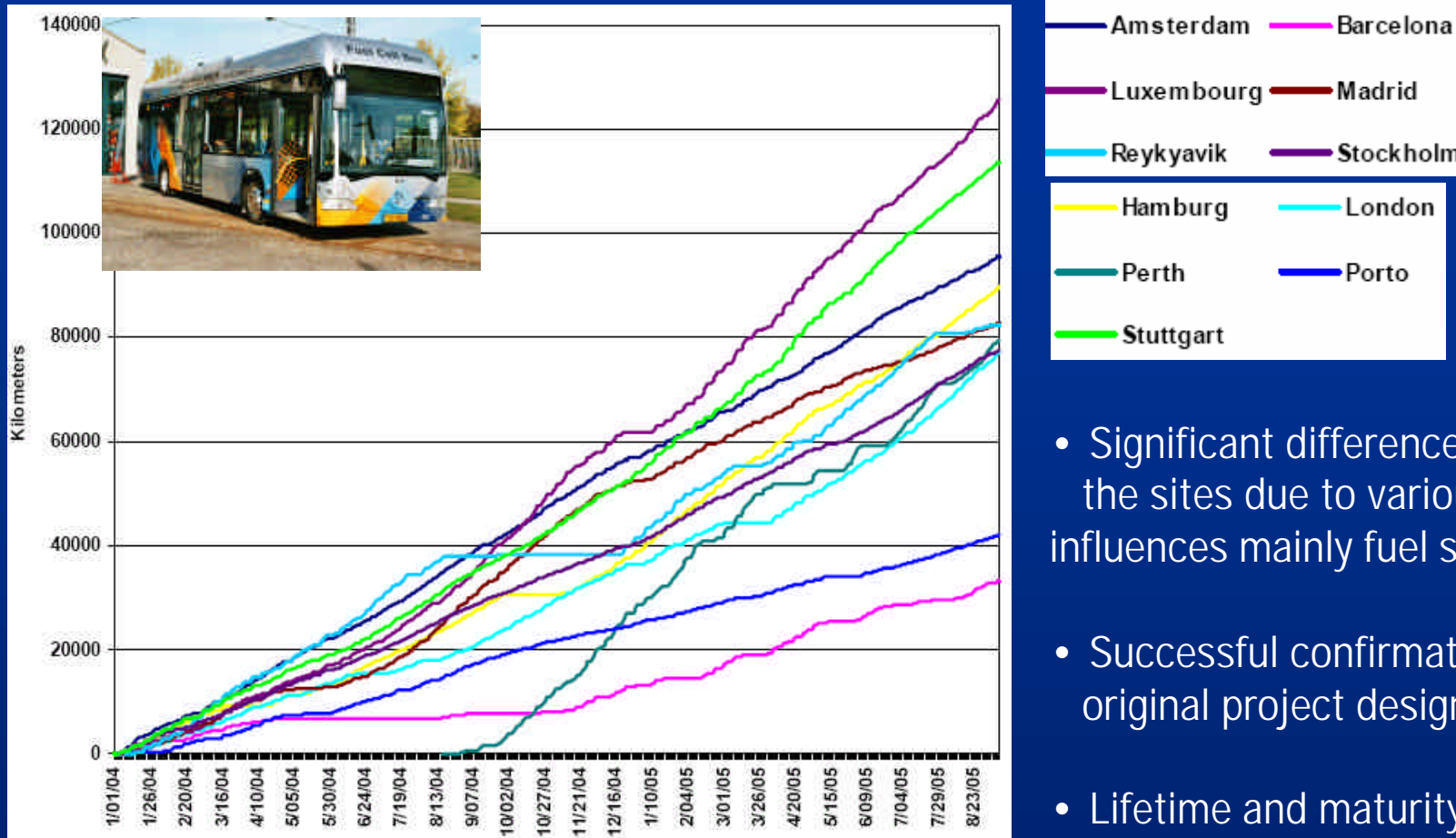
TOTAL HOURS
~76.000 hrs



TOTAL KILOMETERS
~1.080.000km



Performance of the Fuel Cell Buses (km performed)



- Significant differences between the sites due to various influences mainly fuel supply .
- Successful confirmation of original project design.
- Lifetime and maturity of the FC-stacks were much better than anticipated.



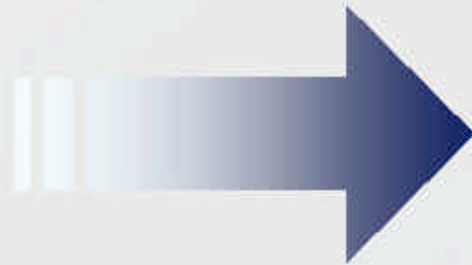
Certification in Europe is still a major issue



Vision in 2000



Up to 15 Fuel Cell Buses in the production Line at one time

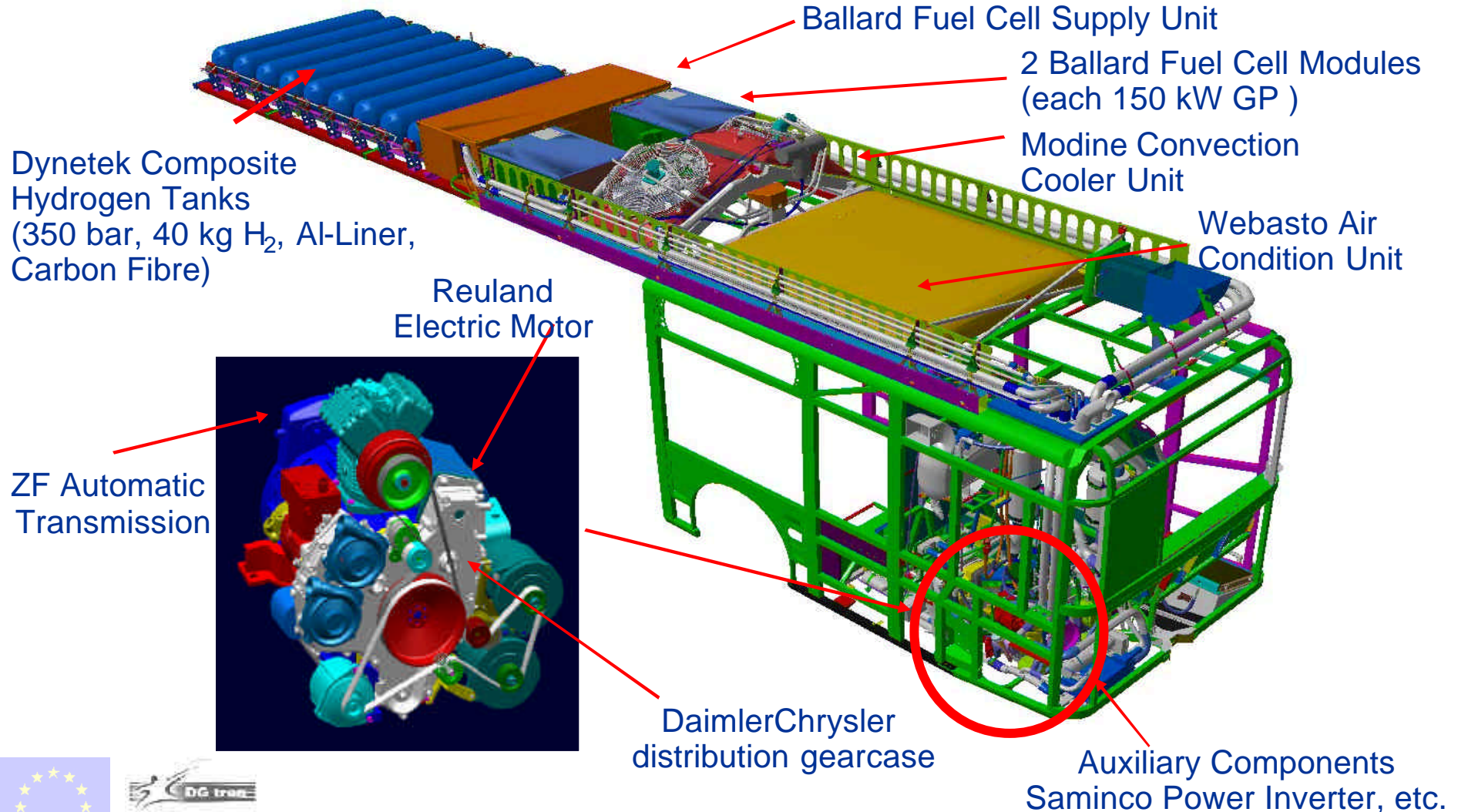


Realisation in 2003



Mercedes-Benz Citaro Fuel Cell Bus - Technical Design

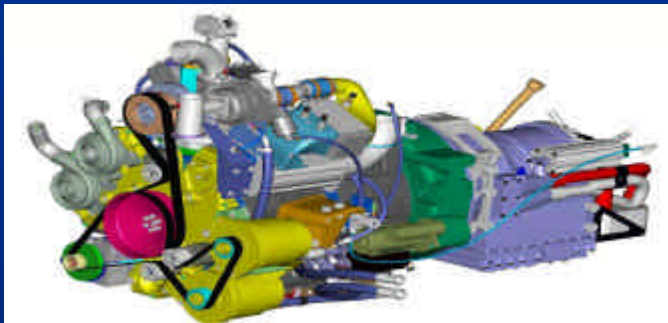
Main Target: Generate Reliability by using Series Components



Technical Experiences with the CUTE Fuel Cell Citaro

The Ballard Stack Module: Special Heavy Duty FC

- First "low mass production"
- Lifetime much better than expected
- High Performance and high availability
- Still Expensive, good weight/performance ratio
- CVM Board to be improved



The Electric Drive Train:

- High reliability
- "Diesel-similar behaviour"
- Efficiency to be improved
- Comfort aspects should be improved



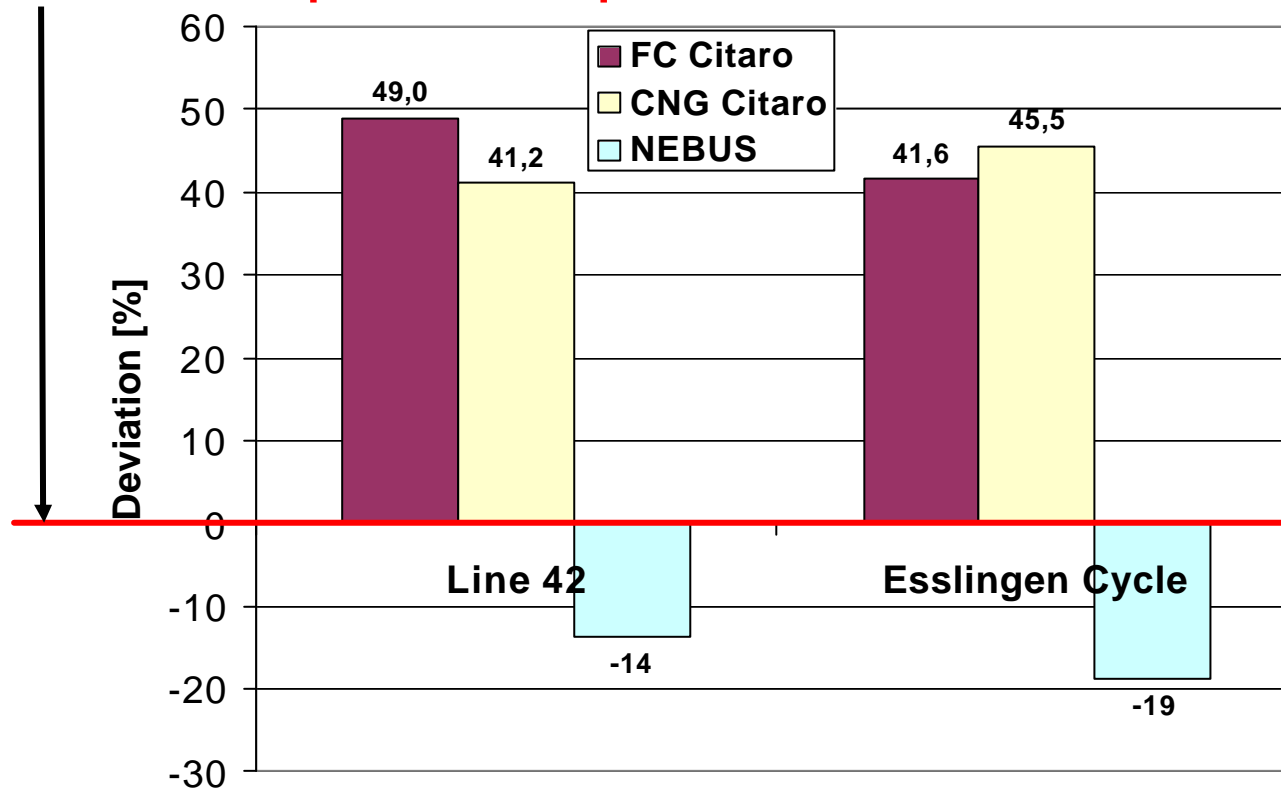
High Voltage Components:

- Still one of the major risks in Electric Vehicles (with regard to reliability)
- "Automotive Suitable"
- Expensive



Although reliability was first priority within CUTE comparisons showed the fuel efficiency potential under city bus conditions

Fuel Consumption in comparison to a Diesel Citaro



- Consumption of FC Citaro needs to be improved,
- NEBUS demonstrates fuel economy potential



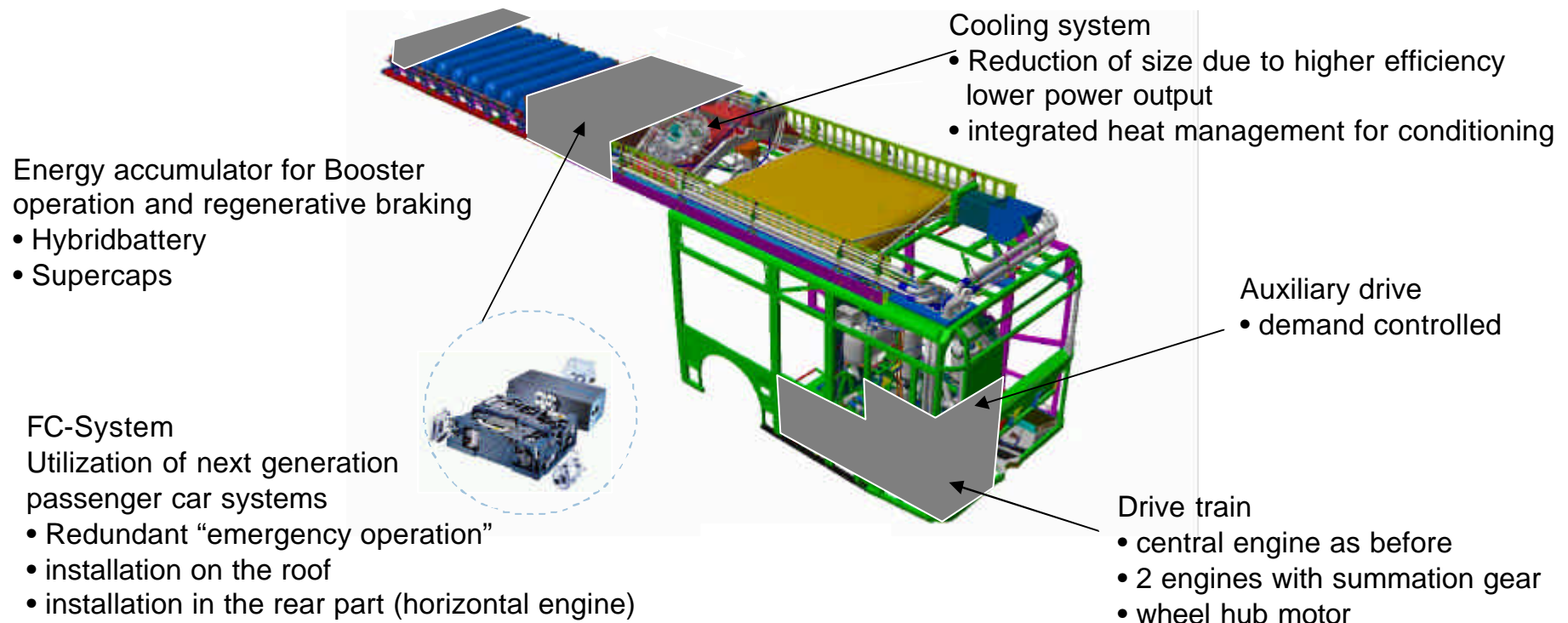
The Next Generation: The HyFLEET:CUTE-project



Fuel Cell Bus Prototype in HyFLEET:CUTE

Tank system

- 350 Bar: Reduction of 1-2 tank cylinder(s) due to higher efficiency -> Weight reduction of 100 kg per cylinder
- 700 Bar: Usage of existing CUTE/ECTOS-fuelling stations problematic



Fuel cell technology needs additional three core technologies to open door towards zero emission vehicles

1. Accumulator systems

battery systems



2. Drive systems

electric drives



3. Energy conversion

fuel cell



Without Partnerships No Progress !

