Meeting with European Parliament – April 25th, 2018

Clean and Energy-efficient road transport vehicles - Kangaroo Group

Presentation by Lars Johansson, Head of Public Affairs, Volvo Buses

Introduction

- Thanks for invitation to this important discussion
- Lars Johansson, Head of Public Affairs, Volvo Buses
    - More than 35 years in the bus business
    - Active in UITP, ACEA and IRU Committees (UITP since 2002)
- Member of some ten European Committees in Brussels (ACEA, UITP and IRU)
- Part of the Expert Group EU COM DG MOVE (Focus on Clean Bus Deployment)

- Environment is one of Volvo Group's core values and Volvo is one of the leading bus manufacturers in the European Electro mobility segment (5.000 Electro mobility buses already sold on the world market)

Comparison Bus Business in China / US-Canada / Europe

- China
    - Rapid development of Electric buses duo to governmental decisions to only allow Electric buses in cities and large subsidies (approximately 50.000 Electric buses 2016)
- US/Canada
    - Federal funding for city buses (approximately 85%)
- Europe

- Traditional tender business – cheapest buses is preferred unless directive from the City or the PTA (example London 2012 introducing Hybrids)
- No european funding/incentives models/monetization promoting environmental products – only local initiatives (example LowCvp in UK) – Mechanism to improve the situation is needed

European bus market - general

- Total market (28.000 / Yearly)
  - City buses 52% and High floor buses 48%
- Average age (around 9 years)
- Total fleet
  - Diesel (approximately 80%, where of appr. 40% Euro III and older)
  - Biodiesel (approximately 10%)
  - CNG (approximately 7%)
  - Other alternative fuels (approximately 3%)
- Road fatalities (0,6 % of total transport)
- Modal share (approximately 60% for buses)
- Current purchase pace of alternative fuelled buses is too low to reach targets 2025

European bus market – products

- Volvo has already a full range of alternative fuel products available today, with focus on
  - Biodiesel (HVO)
  - Hybrids
  - Plug-In Hybrids
  - Electric

- Volvo pioneer with Hybrids already from 2009
- Volvo is today market leader in the electro mobility segment with some 34% market share (Registrations 2014-2017)
- Volvo's low floor bus when Euro VI was introduced only available as Hybrid.

European bus market – markets for Electro mobility products (Hybrids / Plug-In Hybrids / Electric) 2014-2017

- UK (51%)
- France (24%)
- Benelux (9%)
- Sweden (3%)
- Others (13%)

European bus market - Business models

- Current business model (standard Diesel tender) to improve when introducing Electro mobility products
- Focus areas (PTA's)
  - PTA strategy and incentives for deployment of "clean buses"
  - Green loans (coordination)
  - PTA to prepare infrastructure of charging system
  - PTA tendering period (longer needed)
  - Depreciation of infrastructure (separate to the buses – and longer)
- Focus areas (Electro mobility)
  - Energy strategy and Charging strategy

        - Operational strategy and management (mainly route line planning)
        - Higher initial investment
        - Focus on LCC (contract period)
    - Focus areas (General)
        - Environmental costs to be included in all tender evaluation (monetization)

European bus market – Environmental comparisons

- Update of UITP Tender Structure Document Annex IV (environmental calculations) and SORT Protocols for all types of buses
- Preparation for the upcoming CO2 legislation
- CO2 figures (g/passenger/Km) "Well to Wheel" are very good!
    - Diesel Euro VI = 19,1
    - Diesel HVO = 1,3
    - CNG = 21,1
    - Hybrid Biodiesel (HVO) = 6,8
    - Plug-In Hybrid Biodiesel (HVO) = 8,4
    - Electric = 8,0 – 9,0
- CO2 figures (g/passenger/Km) "Tank to Wheel" are very good!
    - Diesel Euro VI = 15,8
    - Biodiesel (HVO) = 0,0
    - CNG = 15,1
    - Hybrid Biodiesel (HVO) = 0,0
    - Plug-In Hybrid Biodiesel (HVO) = 0,0
    - Electric = 0,0

European bus market – Life Cycle Cost Comparison

- Upfront purchase price vs LCC (8 year contract)
- LCC for Electric approximately 15% higher vs Diesel Euro VI (without environmental and health cost included). LCC for Electric including environmental cost about the same as Diesel Euro VI
- Environmental cost to be included (monetizing method preferred)

European bus market - Deployment of Electric buses (Plug-In and Full Electric)

- Investments in 3 areas
    - Electric grid
    - Infrastructure for charging system
    - Buses
- Standardization of charging system
    - Depot charging vs. Opportunity charging
    - Common standards needed for interchangeability
    - Work on-going with UITP and CenCenelec (Recommendation to EU COM June 2018)

FINAL CONCLUSIONS

- Volvo Group Key messages with regards to the CVD Directive
    - General support from the Volvo Group
    - Lower ambition – monetization taken out (part of mechanism)
    - Welcome the changes of the draft report towards the DAFI directive (including biofuels)
- Strong need to focus on 3 parallel tracks in the European bus business

        - Improving existing fleet of buses using biofuels (>80% diesel buses)
        - Securing deployment of buses with alternative fuels now (new business models vs. standard Diesel tenders)
        - Securing national targets of minimum purchasing of "clean buses" according to Clean Vehicle Directive (CVD) 2025 and 2030
    - Changes in European business models needed (relation PTA and PTO primarily) – <u>Mechanism for purchase of alternative fuelled buses to be evaluated and improved</u>

Volvo Buses

- Environment is a Volvo Group core value
- Volvo welcomes all initiatives from the European Commission to accelerate deployment of "Clean vehicles"
- Volvo is prepared with a wide range of products (started already 2009 launching the Volvo 7900 Hybrid, followed by Volvo 7900 Electric Hybrid and 7900 Electric).
- A leader in Electro mobility with over 5000 electrified buses sold globally (Volvo + Nova Bus in North America)

Thanks for your attention!

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