Ministerie van Verkeer en Waterstaat

Clean Buses

Low carbon bus specification and evaluation
The approach in the Netherlands

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Climate and energy policy ambitions Dutch government (2007-…)

Three (cross-sectoral) key ambitions:

- **Reducing CO2 emissions by 30% in 2020 (compared to 1990)**
- Improving energy efficiency by 2% per annum
- Increasing share of renewable energy to 20% in 2020

- Becoming one of Europe's most sustainable and most efficient energy suppliers by 2020

Dutch public transport market

- 19 concession authorities (provinces, urban regions)
- 90 bus concessions (areas), app 10 regional rail concessions
- 4 bus operators in G4 cities (Ams, Rot, tHa, Utr), 3 main ones in the regions, further concentration expected.
- The right to operate buses in an area is tendered for periods up to 8 years.
- Exception: G4. Debate ongoing whether tendering is to be voluntary or mandatory for G4 authorities.
- Sentiment: “19 is too many, 3 is too few”

Buses and environmental innovation

- Concession authorities have the right to set environmental requirements for rolling-stock and operation
- *Bus hours provided* is dominant basis for evaluating tenders, environment comes Xth. But in recent cases environmental demands used as knock-out criterion
- Air quality (Euro-) standards commonly used, carbon standards or objectives rarely
- Diesel is dominant (Euro-4/5, CRT-retrofits), CNG is making strides (and preparing for step to biogas), biodiesel also in some cases
- Few experiments for innovative options: tight budgets, risk aversion

Dutch policy for bus innovation

- Existing fleet:
  - Grants for retrofit Euro-2/3 with particulate traps
  - Promotion of silent tyres, energy-efficient driving style
- New fleet, ready to purchase:
  - Proposal for shared environmental requirements in concessions
  - Proposed: EEV air quality emissions; 2% p.a. efficiency improvement
  - Rationale: gov't Green Procurement objective (50% in 2010)
- Future fleet:
  - Field trials needed to get independent operational and performance information, to be used in future concessions
  - Grant scheme nearly official, 10 mio EURO (additional cost subsidized)

Environmental specifications

- New fleet, ready to purchase:
  - Proposed: EEV; 2% p.a. efficiency improvement
  - EEV allows diesel, CNG, (also hydrogen, hybrid, ethanol)
  - 2% over 13 years would be 30% in 2020, but not feasible with incremental improvements only
  - Concession authorities may go further
- Future fleet:
  - “Alpha” and “beta” tests
  - EEV for air quality
  - Carbon: alpha to be at least 25% better than state-of-the-art diesel bus on TTW emissions/km basis;
  - Carbon: beta to be at least 25% better TTW or 50% better WTW on emissions/km basis

Expected projects

- Known portfolio of projects:

- Hybrid diesel
- Hybrid PPO
- Lightweight hybrid hydrogen fuel cell
- Hydrogen ICE
- Ethanol
- Biogas/hydrogen admixed (“hythane”)
- …