California/EPA Air Resources Board

Zero Emission Bus Regulations Workshop
Status and Future of Fuel Cell Electric Bus

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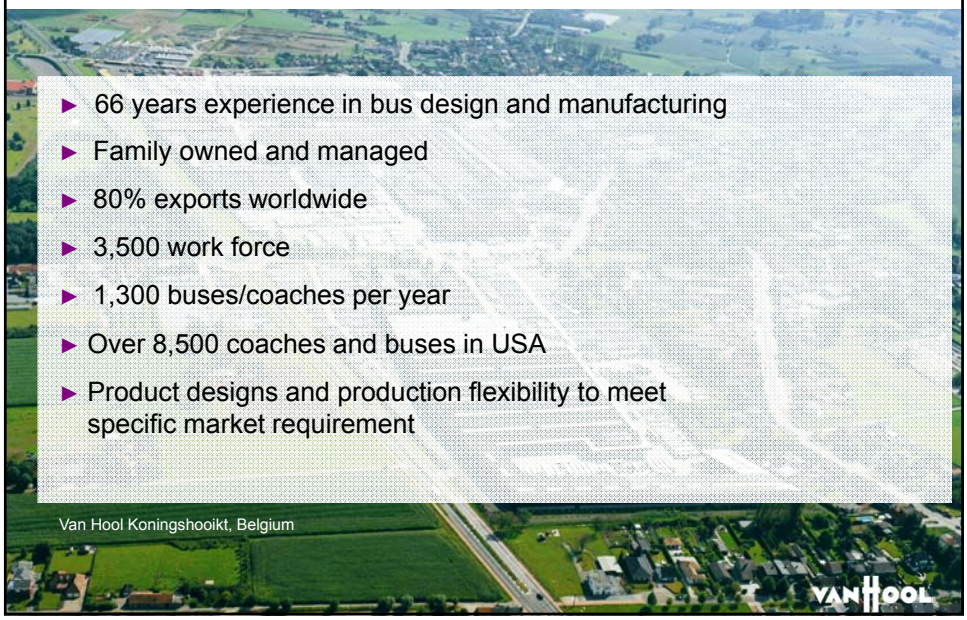
ABC Companies Inc.

Van Hool Today



- 66 years experience in bus design and manufacturing
- Family owned and managed
- 80% exports worldwide
- 3,500 work force
- 1,300 buses/coaches per year
- Over 8,500 coaches and buses in USA
- Product designs and production flexibility to meet specific market requirement

Van Hool Koningshooikt, Belgium

ABC COMPANIES **OVERVIEW**

- North American leader in new and pre-owned motorcoach and transit **EQUIPMENT** sales
- Exclusive North American Distributer for Van Hool Buses and Coaches
- Comprehensive vehicle **SERVICE**, repair and refurbishment
- Extensive **PARTS** inventory and sourcing capabilities
- Comprehensive **CUSTOMERCARE** after sales support services
- Private and municipal leasing and **FINANCING SOLUTIONS**

ABC COMPANIES **BY-THE-NUMBERS**

- **650,000+ sq. ft.** parts, service and collision repair facilities in U.S.
- **8,500+** Van Hool coaches and transit buses on North American highways
- **700+** employees in 11 strategic locations throughout North America
- **600+** coach refurbishments completed since 2009
- **200+** units under maintenance contracts

Bus Range

CNG

Trolley

Fuel cell Electric Hybrid

ExQui.City Hybrid

Diesel-electric hybrid

VANHOOL

Hybrid bus experience

First Generation 2005

Fuel Cell bus , Golden Gate

Van Hool Fuel Cell Bus Program

4 x Oakland, CA and 1 x CT

12 x Oakland, CA and 4 x CT

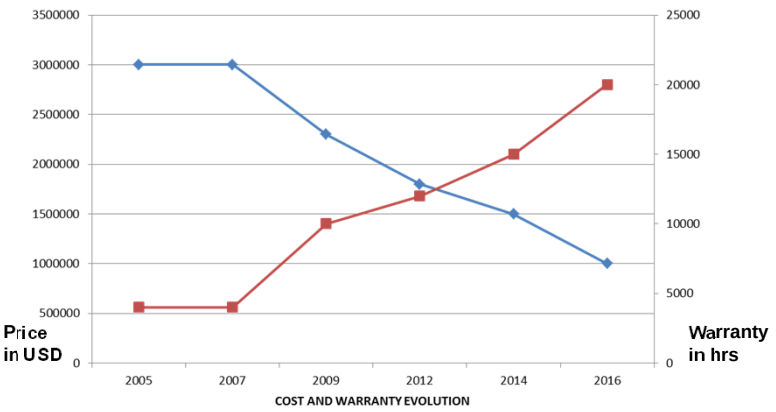
5 x Oslo, Norway

2 x Cologne
20x Antwerp/Sanremo/Aberdeen

Hybrid Fuel Cell Buses

Time >	2005	2007	2009	2011	2012	2014
Development Phases						
1						
2						
3						
4						
5						
6						
Number >	5	1	16	1	5	22
FC >	UTC Power 1. gen.	UTC Power 1. gen.	UTC Power 2. gen.	Ballard 6. gen.	Ballard 6. gen.	Ballard 6. gen -
Batteries >	Ni-C-Cl	Ni-M-H	Li-Ion	Li-Ion	Li-Ion	Lithium
Motors >	Elfa I	Elfa I	Elfa II	Elfa II	Elfa II	Elfa II

Cost and Warranty Evolution



Why FC buses ?

- **Hydrogen is an ideal energy carrier as electricity is made ONBOARD :**

  -ZERO CO2 (GHG), ZERO harmful emissons and extremely low noise levels
  -Allows for total flexibility of operation (as o-pposed to trolleybus overhead lines or opportunity charging stations)

- **Meets the environmental challenges of our time : CLIMATE CHANGE**
  - –Fosters the use of Renewables (solar and wind energy)
  - –Allows for storage by converting excess energy (solar or wind)
  - –Mitigates air quality problems

- **Meets the economic and social challenges of our time : SUSTAINABILITY**
  - –Green job creation
  - –Mitigate cost of healthcare
  - –Increase (emission-free) mobility

Technology & Performance Enhancements

- **Battery Dominant Fuel Cell Bus**
  - Improved Battery Efficiency (incl. brake energy regeneration efficiency)
  - Lower output fuel cells (60 kW iso 150 kW)
- **Improved fuel cell longevity-steady state operation**
  - Longer life
  - Lower fuel consumption
  - Lower TCO

Zero Emission Game Changers

- **Public Transport Funding**
- **Amortization periods for zero emission buses**
- **Political agendas (Emission mandates)**
- **Technology leaps (Fuel cells vs opportunity charging)**

Our Future:

The new BRT concept

more capacity

Serial electric propulsion

comfort

functional aerodynamic design

VANHOOL EXQUI.CITY

Increased economic efficiency

EXQUI.CITY 24

84 Passengers

162 Passengers

FC

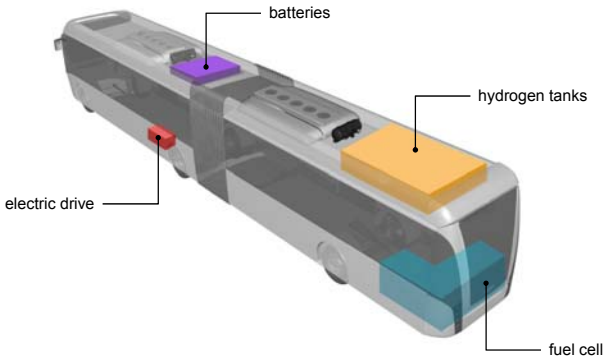
USD 100

USD 74

Cost per Passenger - 26%

VANHOOL

Technical Concept Articulated Fuel Cell Bus



2 energy sources distributing power to the drive

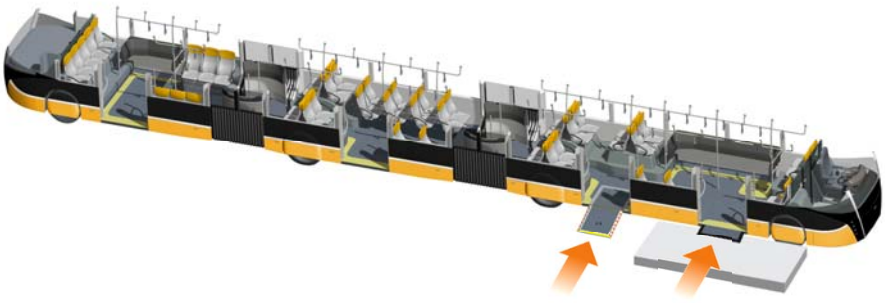
Exqui.City 24

Driver's Cabin

- Separated driver's cabin
- Ergonomic working conditions
- Separated climate control
- Improved Safety

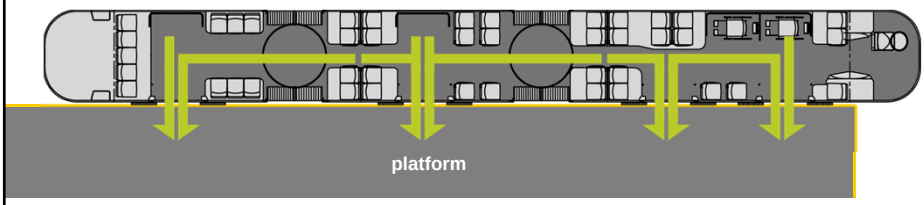
VANHOOL EXQUICITY

Accessibility



VANHOOL EXQUICITY

Passenger flow



- improved passenger flow in the interior
- the interior design enables fast boarding
- 4 doors with a total door opening of 4,8 m

Exqui.City – The Future. Here. Now.

Thank you for your attention