Experiences of DHL Express Germany with Daily CNG delivery vehicles

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BESTUFS-II conference, Malta 19 May 2006
IVECO history

1986

1991 NAVECO China

1991

1999

1986

1999/2001

1997 Iveco Fiat do Brazil

1992 Iveco Truck Australia Ltd

1975
2006 IVECO Manufacturing Footprint - 1

Manufacturing Plants
- Equity share > 50%
- Equity share ≤ 50%

Italy, Turin
- Axles
- Tector engines
- NEF engines
- Transmissions

Italy, Bolzano
- Defence

Italy, Foggia
- Engines

Italy, Valle Ufita
- Engines

Italy, Piacenza
- Off-road range

Italy, Brescia
- Medium/Heavy range

Italy, Suzzara
- Light range

Italy, Modena
- Bus styling

Italy, Valle Ufita
- Bus components/Prototypes

Italy, Pregnana Milanese
- Power units

Spain, Barcelona
- Axles
- Bus chassis

Spain, Valladolid
- Light range

Spain, Madrid
- Medium/Heavy range

France, Fécamp
- Power units

France, Rorthais
- Urban buses

France, Bourbon-Lancy
- Cursor engines

France, Chambery
- Firefighting

France, Fourchambault
- Engines services

Germany, Ulm
- Medium/Heavy range

Germany, Görlitz
- Firefighting

Germany, Ulm
- Firefighting

Germany, Weismel
- Firefighting

Czech Republic, Vysoke Myto
- Buses/Coaches

Austria, Graz
- Firefighting

Hungary, Budapest
- Buses/Coaches

Italy, Bolzano
- Defence

Italy, Vittorio Veneto
- Bus components/Prototypes

Italy, Brescia
- Medium/Heavy range/Firefighting

Italy, Piacenza
- Off-road range

Italy, Modena
- Bus styling

Update 02/2006
Manufacturing Plants

- Equity share > 50%
- Equity share ≤ 50%
IVECO Focus

ENVIRONMENTAL CARE

TRANSPORT SAFETY

PRODUCTIVITY ON THE ROAD

IVECO
## IVECO Advanced Technologies & Systems

### Environmental Care
- Euro 5 compatible engine product range
- Compressed Natural Gas Technologies (CNG)
- Development of alternative fuels

### Transport Safety
- Pre-crash system
- Haptic lane assistant
- Night/Fog vision
- Back-up aid
- Driver status monitoring
- Active anti-rollover system
- Independent suspension
- Blind spot monitoring

### Productivity on the Road
- Open architecture systems
- Supply chain Management
- Database & logistics management
- Vehicle management
- Safety & Security
- Emissions control
Environmental Care

Rationale of the IVECO Strategy

Full commitment to environmentally friendly transport solutions based on:

- Outstanding product technology
- Innovative transport systems
- Emissions Reduction
- Energy Consumption
- Energy Use Diversification
- Recycling
- Training Programs
- Communication
Fuel Availability

Fossil Fuels availability

40 years for petrol!
60 years for natural gas!

2010: necessity of massive exploitation of actual stock.
### Improvement of diesel fuel
To enable the exploitation of Diesel engines and their further evolution.

### Natural Gas and Biogas
NG is the most realistic alternative fuel in short term. Biogas adds benefits in terms of CO2 emissions.

### Biodiesel
Limited availability. It will be used mainly as blend (5 to 30%) in diesel.

### GTL (Gas to Liquid)
It will gain importance in the next decade. First as fuel improver, later as fuel for advanced Diesel engines.

### BTL (Biomass to Liquid)
Derived from biomass. CO2 neutral.

### Hydrogen & Hythane (CNG + H2):
Long term fuel for fuel cells application (Hythane transition fuel).
IVECO Natural Gas Engines

Main Features:

- Better than Euro 5 and EEV emission limit values;
- CO² emissions slightly better than diesel;
- Dedicated to urban transport;
- Competitive Total Cost of Ownership;
- Vehicle price reduced by increasing volumes;
- Development of natural gas distribution network;
Advantages of CNG for goods/passenger transport

Alternative fuel used in trucks and buses offers significant advantages:

- Lower gaseous emissions – Euro 4-5 compliance;
- Lower noise;
- Reduced CO² emission (Kyoto agreements);
- EU proposal for fixed % of environmentally-friendly vehicles in public administrations;

In the case of stoichiometric mixture combustion (Iveco choice), exhaust pollutants are well below the levels of the EEV (Enhanced Environmental Vehicle), very near the fuel cell level.
In Italy, the percentage increase of the cost between March 2005 and beginning 2006 has been:

- Gas oil: +11%
- Methane: +10%

Difference due also to the different taxation.

Between 20% and 30% less of fuel cost vs. gas oil depending on type of mission.
IVECO is the major player of CNG in Europe, and the clear leader in buses.
Experiences of DHL Express Germany with CNG vehicles for parcel deliveries
DHL: the express and logistics network of Deutsche Post World Net

**Facts and figures**

- 120,000 destinations worldwide
- Over 170,000 employees
- About 75,000 vehicles
- 250 airplanes
- 36 hubs
- 900 depots
The rationale of DHL for clean commercial vehicles

- World-class logistics services require continued accessibility to customers
- Consequent corporate sustainability agenda to minimise environmental impacts on climate change and air pollution, and secure mobility for future generations
- Enabling of efficient logistics with clean vehicle technologies including CNG
- Various pilot projects, e.g. with CNG vehicles in Regensburg since 1999
Experiences of DHL Express Germany

Initial dilemma: low emissions vs. payload capacity?

- DHL vehicles for parcel delivery in Germany are optimised to accept 40% extra payload as compared to the standard version, thus avoiding unnecessary trips.
- However, these variants were so far not available with CNG drives!
- Smaller vehicles must return to depot prematurely to pick up additional parcels.
- Affordable at small scale, but not in larger cities: potential doubling of mileage!
The tender and procurement phase

- Clean vehicles for DHL must maintain functional optimisation of diesel variants, no trading of low emissions against additional trips and mileage!
- Extensive discussions with vehicle manufacturers about possible solutions
- Open tender in late 2004 for 50+20 CNG parcel delivery vans in full service
- Two bidders, final decision for the **IVECO Daily 50C11 P CNG**
The first CNG fleet deployments

- Stationing of first 50 CNG vehicles in cities with particular air quality problems
- Deployment in close concertation with local and national stakeholders, focus on adequate infrastructure and operating framework conditions
- Sites for 2005: Berlin, Bremen, Düsseldorf, Munich, Stuttgart, Regensburg
- Joint launch events in each city during October/November 2005
First impressions and next steps

- CNG engines worked trouble-free from day one – normal initial adjustments only
- Excellent customer and public response, supported by dedicated livery
- Performance of IVECO Daily 50C11 P CNG enabled DHL Express Germany to order a further 100 vehicles of the same type for 2006
- Potential sites for this second deployment phase currently under review
- By the end of 2006, DHL Express will operate 170 CNG delivery vans as practical contribution to reduce environmental burdens in German cities!
Experience and Durability

World cities with IVECO CNG vehicles in service

ALESSANDRIA
ANCONA
ANNECY
ASCHAFFENBURG
ATHENS
AUGSBURG
BARCELONA
BERLIN
BESANÇON
BOGOTA
BOLOGNA
BOLZANO
BORDEAUX
BREMEN
BRESCIA
BRUXELLES
BURGOS
CAMERINO
CATANIA
CHAMBERY
COLMAR
DUNKERQUE
DUSSELDORF
FANO
FERRARA
FIRENZE
FOGGIA
FRANKFURT
GRENOBLE
HAMBURG
JESI
LE MANS
LILLE
LONDON
MADRID
MALAGA
MARNE
MILANO
MONTPELLIER
MUNICH
NAPOLI
NICE
PADOVA
PALERMO
PARIS
PARMA
PAVIA
PERUGIA
POITIERS
PORTO RECANATI
RAVENNA
ROMA
SALAMANCA
SENIGALLIA
SEOUL
SEVILLA
SIENA
STRASBOURG
STUTTGART
TAIPEI
TARANTO
TEHRAN
TORINO
TRENTINO
UDINE
URBINO
VALENCE
VALENCIA
VITORIA
WARSAW
ZURICH

TOTAL CNG FLEET MILEAGE: >524.000.000 km
Conclusions

- CNG vehicles constitute an economic, up-to-date and dependable alternative to diesel vehicles, to improve acoustic and gaseous emissions simultaneously;

- Additionally, CNG IVECO vehicles, with stoichiometric combustion, provide even better pollution and CO² emission levels;

- Today IVECO offers a range of CNG vehicles complying with the E.E.V. standard and continues developing state-of-the-art CNG vehicles to satisfy global market needs;

IVECO CNG means:

EXPERIENCE – TECHNOLOGY – COMMITMENT
Road Map IVECO

- Evolution of DIESEL
- Natural Gas (CNG)
- Synthetic diesel fuel
- Hybrid propulsion
- Fuel cells
**IVECO approach to Bio-diesel**

- Obtained from different vegetal origins, like soy, rapeseed, etc;

- The European Union accepts the mixture of 5% of bio-diesel in the normal diesel oil, without any communication to the customer. This 5% mixture is accepted by all the engine manufacturers without restrictions;

- It has to respond to a very strict technical datasheet, and that is why only big and dedicated production plants are able to produce good quality bio-diesel;

- The manufacturers of Diesel Common Rail Injection Systems have put the technical limit in this 5%, because some components of the systems can show long term problems with the bio diesel;

- In the unit injector type truck and bus normal engines, those can run with up to 30% of bio-diesel, but oil drain intervals have to be halved (double used oil production) there is not enough experience about long period durability;
Hybrids
Hybrids
Hydrogen has the potential to become a long term clean fuel, with no pollutant emissions, but:

“Hydrogen production today requires a high amount of electrical energy to obtain it from water, or it does release a lot of CO² to the atmosphere if we obtain it through reforming of methane (natural gas)”
IVECO approach to Hydrogen and fuel cells

- Fuel cell technology for truck or bus application is still very far away from industrialization, not less than 20-30 years;

- Hydrogen can be used as a fuel in normal combustion engines, but the specific power drops to about 55%;

- Having a so light density, it has to be stored at 700 bars in order to have a significant amount of energy in the tank of the vehicle;

- The energy needed to compress at 700 bars is not negligible;
New IVECO logo for clean vehicles

ENVIRONMENT:
WE LOOK AHEAD.