Versatile propulsion vehicle

Jan Vodstrčil

Loučeň 9-10.3.2017
Our commitment to address the issues of today and tomorrow

**ENVIRONMENTAL CARE**

**SUSTAINABILITY**
Taking care of people mobility needs in a safe and sustainable way

**EFFICIENCY**

**TCO**
Best-in-class technology to answer the need for efficiency and availability

**ATTRACTIVENESS**

**VALUE**
More attractive and clever than ever
FULL-LINE RANGE
A FULL RANGE FOR SUSTAINABLE PUBLIC TRANSPORT

ALL SOLUTIONS FOR SUSTAINABLE TRANSPORT
EFFICIENCY
EURO VI HI-SCR - UNIQUE TECHNOLOGY
NEW TECTOR 7 AND CURSOR 9 ENGINES
UP TO 800KG LIGHTER

HIGH COMFORT
PASSENGER LOUNGE
NEW SEATS
NEW LED ROOF LIGHTS
EFFICIENT AIR CONDITIONING

EBSF DRIVER’S AREA
GENEROUS SPACE
THERMAL COMFORT
OPTIMIZED STORAGE

DESIGN
NEW STYLE with LED LIGHTS
NUMEROUS BHLS OPTIONS
EASY MAINTENANCE
A wide range of city buses

- The new structure makes URBANWAY versatile enough to accommodate different customer preferences

### Diesel Euro VI

<table>
<thead>
<tr>
<th>Length (m)</th>
<th>Motor</th>
<th>Výkon HP</th>
<th>Kr. moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5</td>
<td>Tector 7</td>
<td>286</td>
<td>1000</td>
</tr>
<tr>
<td>12</td>
<td>Tector 7</td>
<td>286</td>
<td>1000</td>
</tr>
<tr>
<td>12</td>
<td>Cursor 9</td>
<td>310</td>
<td>1300</td>
</tr>
<tr>
<td>12</td>
<td>Cursor 9</td>
<td>360</td>
<td>1650</td>
</tr>
<tr>
<td>18</td>
<td>Cursor 9</td>
<td>360</td>
<td>1650</td>
</tr>
<tr>
<td>18</td>
<td>Cursor 9</td>
<td>400</td>
<td>1700</td>
</tr>
</tbody>
</table>

### CNG Euro VI

<table>
<thead>
<tr>
<th>Length (m)</th>
<th>Motor</th>
<th>Výkon HP</th>
<th>Kr. moment</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.5</td>
<td>Cursor 8</td>
<td>290</td>
<td>1100</td>
</tr>
<tr>
<td>12</td>
<td>Cursor 8</td>
<td>290</td>
<td>1300</td>
</tr>
<tr>
<td>18</td>
<td>Cursor 8</td>
<td>330</td>
<td>1300</td>
</tr>
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</table>

### Hybrid Euro VI

<table>
<thead>
<tr>
<th>Length (m)</th>
<th>Motor</th>
<th>Engine Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>12</td>
<td>Tector 7</td>
<td>Serial Hybrid Arrive &amp; Go</td>
</tr>
<tr>
<td>18</td>
<td>Tector 7</td>
<td>Serial Hybrid Arrive &amp; Go</td>
</tr>
</tbody>
</table>
URBANWAY
FULL HYBRID

PRODUC TIVITY
MORE PASSENGERS

ENERGY MANAGEMENT
SMART ENGINEERING

SILENCE
ZEV MODE

EMISSIONS REDUCTION
CO2 & NOX
Serial Hybrid structure

SERIAL HYBRID IS WELL SUITED FOR ENERGY MANAGEMENT

**Batteries:**
- Power: 200 kW peak
- Capacity: 11KWh
- Weight: 385kg

**Auxiliaries**
- Inverter 24v
- Weight: 41kg

**Power Control System**
- 2x200kw continuous
- Weight: 85kg

**2 Cooling pack:**
- One for electronic units
- One for electric engine and generator
- Weight 2x48kg

**Generator**
- w/o electric starter
- 140kw
- Weight 115kg

**1 single electric motor**
- including 4:1 reduction
- 120kw – 283kg

**Tector 7**

**Conventional drive axle + Twin tires**

**Electric steering pump**

**BAE Systems supply kit**
Improving the efficiency

SERIAL HYBRID IS WELL SUITED FOR ENERGY MANAGEMENT

Serial Hybrid
- No alternator
- No starter

Belt driven A/C
- High performance
- Excellent diffusion

Power steering
- Electric pump
- EV mode
- Speed adaptive

Engine driven
- Air compressor
- Energy saving -20% charge

LED Lighting
- Interior / Exterior
- Electric consumption / 3

Special settings of Tector

Weight saving
- Longitudinal
- -500 kg on rear axle

Engine for Hybrid applications
More passengers

NEW ARCHITECTURE TO INCREASE CAPACITY

- 300 kg of new structure Urbanway
- 500 kg at rear axle (longitudinal engine layout)

Passengers
- Euro V Hybrid:
- Euro VI Hybrid:

+15 pass
Excellence of Serial Hybrid

EFFICIENCY & MASSIVE REDUCTION OF EMISSION

Best Hybrid System
« After an intensive series of tests carried out by Graz Techn. Univ., the leading hybrid bus system is Serial Hybrid with batteries. » 
Public Transport Company of Vienna

33% CO₂ Emission reduction
Roller bench test in urban mission

Silence Benefit
Full Hybrid vs Diesel
-7 dB at 16 km/h

-40% NOx Reduction
real operation in Lyon, 65 000 km travelled

Hybrid mode → Electric mode → BUS STOP
- no vibration
- no emission
- silence

Electric mode → Hybrid mode
Below 20 km/h switch off generator
20 km/h or 30 m switch on generator
Benefits on climate and health

Issues
- Green House Gases
- NOx emissions
- Silence
- Finance

Solutions by Iveco Bus
- -50% CO$_2$ emission / passenger
- -40% NOx emissions
- -7 dB
- Payback: is political question?

Urbanway 18 m Full Hybrid
Best solution for social benefits
Technologie CNG – ready to use

Výkony motorů srovnatelné s dieselovými
Technologie vozidla komplikovanější
Úspory na palivu

Založena na vyzkoušené a zvládnuté technice
dieselů
Spolehlivost, servisovatelnost

20 let našich vozidel v reálném provozu
Problémy identifikovány a ošetřeny
Odstranění bezpečnostních rizik
Infrastruktura roste
A wide range of city buses

- The new structure makes URBANWAY versatile enough to accommodate different customer preferences

### Diesel Euro VI

- 10.5 m
  - Tector 7: 286 HP, 1000 Nm
- 18 m
  - Tector 7: 286 HP, 1000 Nm

### CNG Euro VI

- 18 m
  - Cursor 9: 360 HP, 1650 Nm
  - Cursor 8: 330 HP, 1300 Nm

### Hybrid Euro VI

- 1043 sold 2013-2016

- 2000 sold 2013-2016
- 2500 sold 2013-2016

January 2017

WELCOME IVECO BUS
Excellence of Serial Hybrid

EFFICIENCY & MASSIVE REDUCTION OF EMISSION

Best Hybrid System
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Public Transport Company of Vienna

33% CO₂ Emission reduction
Emissions par km
Roller bench test in urban mission

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<th>Hybrid</th>
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<tr>
<td>Emission</td>
<td>1426 g/km</td>
<td>963 g/km</td>
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-40% NOx Reduction
Emissions par km
measures on city bus during real operation in Lyon 4 different routes, 65 000 km travelled

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<th>Hybrid</th>
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<tbody>
<tr>
<td>Emission</td>
<td>10,3 g/km</td>
<td>6,2 g/km</td>
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</table>

Labs & test tracks

Petrol Institute

UTAC
The benefit of electric drive: outside
EV mode helping for a quieter city

External Noise levels vs. Speed (Right Hand Side of the bus)

Noise dB(A) vs. Speed (km/h)

- FULL HYBRID
- HYBRID
- DIESEL

Silence Benefit of Full Hybrid vs Diesel
-7 dB at 16 km/h

Labs & test tracks
The benefit of electric drive: outside
EV mode helping for a quieter city

Full Hybrid with «Arrive & Go» electric mode automatic around bus stations

- no vibration
- no emission
- silence

Below 20 km/h switch off generator

Above 20 km/h or 30 m switch on generator