Solaris Bus & Coach
in the Hybrid Commercial Vehicle project

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About Solaris Bus & Coach

- Founded in 1996
- **Electric mobility since 2001** (trolleybuses), 2006 (hybrid buses) and 2011 (battery buses)
- Building trams since 2009
- **2,300 employees in Poland and 200 in international sales and after sales subsidiaries**
- Headquarters and four production sites in Greater Poznań region
- €358 million turnover (2013)
- **Largest independent city bus builder in continental Europe**
- Production capacity 40 buses/week and 1 tram/week
Product development timeline

**Road**
- Combustion engine / hybrid
  - Diesel 1999
  - CNG 2004
  - Parallel hybrid 2006
  - Series hybrid 2010

**Road**
- Electric
  - Trolleybus 2001
  - Electric bus 2011

**Rail**
- Electric
  - Tram 2009
Trendsetter for hybrid buses in Europe

- First European city bus with **volume-production hybrid technology** (2006)
- Offer of different diesel-electric hybrid technologies gives operators the choice of suitable hybrid drive systems
- **Fuel consumption** reduced by up to 29%, **emissions** by up to 78%
Almost 200 Solaris hybrid buses in service or on order
Main targets for Solaris in the HCV Project

Solaris takes part in two sub-projects SP2000 & SP6000 under HCV project:

SP2000 → The main objectives of this sub-project are the definition, adaptation and optimization of the auxiliary technology for particular applications under consideration of vehicle boundaries and interfaces, and control functions.

The following electrification of auxiliaries are developed and validated by Solaris:

- Auxiliaries for passengers comfort function (e-heating, e-compressor)
- Chassis auxiliaries (e-steering servo)
- Powertrain auxiliaries (e-fans, High Power Generator)

Fig. e-heater
Main targets for Solaris in the HCV Project

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**SP6000** → the main objectives for Solaris under this sub-project are:

- Bus providing and support in validation of hybrid test cycle and procedure
- Bus providing for demonstration of Hybrid bus (Prague, Grudziadz, Pforzheim)

Fig. Road test in Prague  
Fig. Demonstrations in Pforzheim
HCV project results for SOLARIS vehicle users

Definitely, the most important outcome of HCV project for users and passengers is the fact that the most of selected and tested auxiliaries are **successfully applied by SOLARIS** to modern hybrid, electric and trolley buses as well as to the new buses with combustion engines passed EURO VI emission standard.

As part of SP2000 the market research has been carried out and based on the decision matrix tool the best auxiliaries for end users was selected taking into account such parameters as price, efficiency, energy consumption and curb weight.

**HCV project and cooperation with partners** within European Consortium helped SOLARIS to select and apply the best solutions that will be used in the nearest future in the public transport vehicles.
Hybrid buses are part of electric mobility

- Electric bus: emission free at point of operation
- Hybrid bus
- Battery bus
- Trolleybus

- Diesel auxiliary power unit
- Oil/diesel heater / range extender with diesel engine
- Zero emission operation
Hybrid buses are part of electric mobility

Energy storage
- Battery
- Supercapacitors

Energy supply
- Energy generation
- Traction electrics
  - Generator
    - Diesel engine
    - Gas engine
  - Fuel cell
- Overhead line
  - Fast charging
- Conductive
- Inductive
- Cable & plug

Electric motor
- Drive axle
Thank you!
Any questions?

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