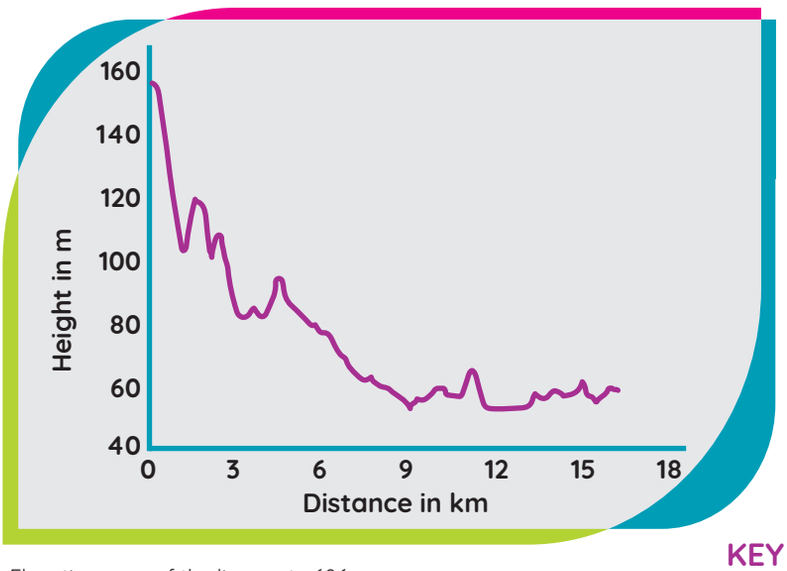
Bonn (DE)

DESCRIPTION

Stadtwerke Bonn (SWB Bus und Bahn), the local transport operator, plans to convert its bus fleet from diesel to electric propulsion. The ZeEUS Demonstration, using six electric buses, is viewed as a first step towards this ambitious goal.

The 12m battery buses operate on all lines, providing a comprehensive overview on the opportunities and challenges of operating buses using an overnight charging approach.

E-Bus in Bonn, connecting Central Station with Headquater of DHL an UNFCCC



Elevation map of the line route 606

DEMO IN BRIEF

Vehicle technology:
6 x Full Electric

Brand and model:
Sileo S12 (Bozankaya)

Bus length: 12m

Capacity: 80 passengers

Charging technology:
Overnight at depot

Duration:
April 2016 – March 2018

OPERATIONAL CONDITIONS

Line number: mainly 606/607, also other lines

Typology: City centre and suburban areas

Topography: mostly flat with moderate hills

Length: 17km

Average commercial speed: 16.6km/h

Total daily hours of operation: 13.5h

Total km driven/vehicle/day: 200km

Av. no. of passengers/day: 7,250 passengers (Mon-Fri)

SORT type: N/A

KEY TOPIC

From the outset, any considerations about operating electric buses SWB Bus und Bahn had to meet three essential preconditions before any project launch:

- Full integration of electric buses into the existing fleet
- One-for-one replacement of diesel buses
- No adaptations to lines and service schedules

The major challenge was to identify the most suitable electric bus for these parameters.

During the demonstration period, the focus was on proving the operational suitability during daily service while monitoring the development of range, reliability and frequency of repairs.

DEMO TIMELINE

- **Apr 2016** - Start of operations
- **Nov 2015** - Beginning of training
- **Nov 2015** - Preparation of depot/garage
- **Jul 2015** - Procurement
- **Feb 2015** - Start of tender process
- **Jan 2014** - Feasibility study report
- **Feb 2012** - Project launch

Six electric Sileo buses in Bonn

FIGURES FOR THE BONN DEMO FROM MARCH 2016 TO DECEMBER 2017

93,736 litres[1]
The amount of diesel fuel saved by the ZeEUS bus project

[1] Assuming 38l/100 km

246,674km
The distance travelled by ZeEUS buses running in pure electric mode

99,809kg[2]
The amount of carbon dioxide emissions prevented by the ZeEUS bus project

[2] ISO 16258 factor for Diesel and GaBi factor for EU electricity grid mix (2014)

RESULTS AND LESSONS LEARNED

- The ZeEUS-Project has provided valuable experience for shaping our future approach
- From an ecological perspective, we would prefer to convert to electric propulsion as soon as possible. However, from an economic perspective, we need to be patient
- The reliability and range of the vehicles has to be improved, particularly for low-temperature operations
- A key challenge in the depot is to ensure effective interaction between vehicle and charging infrastructure

Conclusion: Currently, it is not feasible to replace diesel buses with electric buses on a one-to-one basis

"Bonn is home to UNFCCC and is the German Capital of Sustainability. Zero emissions in public transport are our aim and ambition."

Anja Wenmakers, CEO SWB Bus und Bahn

FUTURE PLANS

We will persist with the chosen approach, with the aim of finding the optimum technical solution for balancing economic efficiency with environmental sustainability.

www.zeeus.eu

Fraunhofer IVI

SWB Bus und Bahn

The ZeEUS project is coordinated by UITP. ZeEUS is co-funded by the European Commission under the 7th Research & Innovation Framework Programme, Mobility & Transport Directorate General under grant agreement n° 605485. The ZeEUS project has been launched by the European Commission in the frame of the European Green Vehicle and Smart Cities & Communities.

UITP ADVANCING PUBLIC TRANSPORT