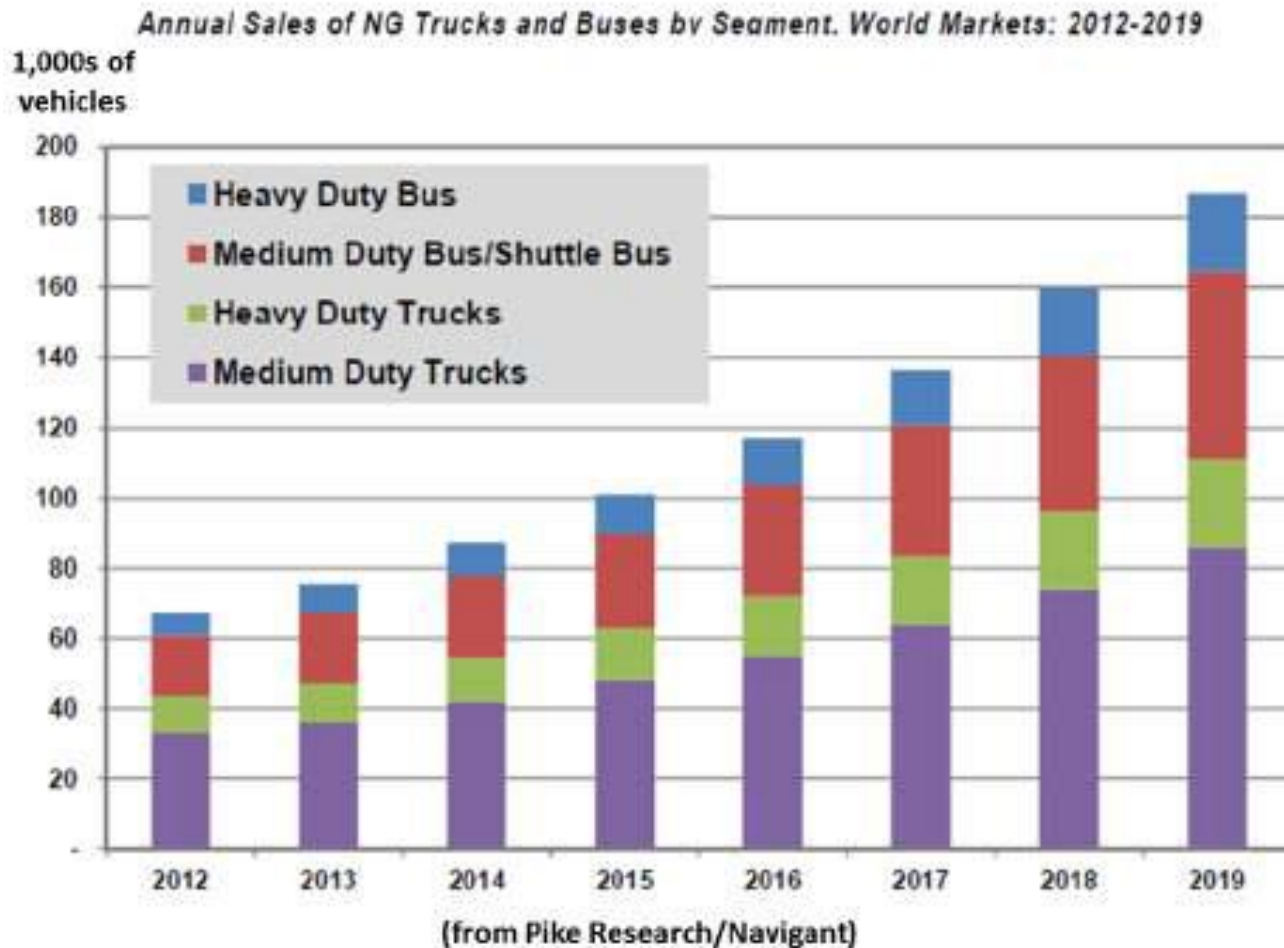




ASSURED: fASt and Smart charging solutions for full size URban hEavy Duty applications

Coodinator: Prof. Dr. Eng. Noshin Omar

Market situation & ASSURED contribution

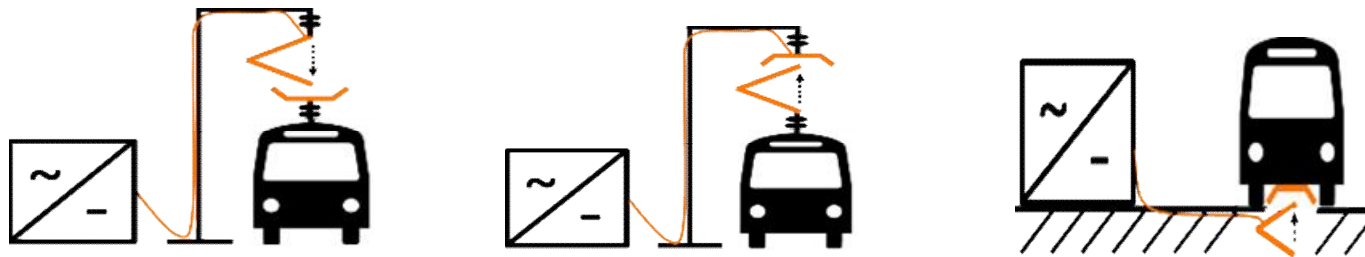


State of the art HD urban buses



- Charging solutions are limited up to 450kW and do not have any interoperable or standardized interfaces yet
- Work on standardization ongoing, but not yet standardized solutions between OEMs and CSP
- Impact on the the grid stability is still not well known
- Energy management strategies are typically applied on vehicle level and not on fleet
- Building on the increasing number of field test data initiated by ZeEUS
- Impact on the battery lifetime is still not clearly known
- Need to progress in the business models definition and data identification

- Development of next generation modular high-power charging solutions (up to 600kW),
- Interoperable and scalable high power charging solutions,



- Innovative charging management strategies to improve TCO
- Development and demonstration of efficient wireless charging solutions up to 100kW
- Evaluation of the cost, energy efficiency, impact of grid

Innovation



- Demonstration of ASSURED solutions (6 public buses at TRL 7) in EU cities
- Supporting standardization bodies (i.e. CEN-CENELEC, ISO, IEC)
- Standardized conformance and interoperability test protocol
- ASSURED technological solutions are expected to be on the market between 2021-2023
- Use cases will be developed into business cases, considering commercial as well as societal costs and benefits, both financial and nonfinancial, e.g. noise, environmental, health and safety aspects.



Project Phases



Operational specifications & requirements and city needs

PHASE 0

- Standardization support & Development of Conformance/Interoperability Test Framework
- Interoperability and conformance tests of charging solutions

PHASE I

Use cases (6 HD urban buses)

PHASE II

- User Acceptance & Demonstration in Cities
- Evaluation of Use Cases and Demonstration

PHASE III

6 Use Cases HD e-Buses



Focus on the validation of the technologies developed on the vehicles (phase II)



Turin/Lyon



Jaworzno



Goteborg



Helmond



Bayonne



Castejón

3 Demonstrations for User Acceptance



Focus on transport authorities and operators (phase III)

Barcelona
& Osnabruck

- Interoperability between buses and chargers of different brands, on vehicles in real operations

Goteborg

- Interoperability between bus and urban trucks

Eindhoven

- Smart charging for fleet upscale

Technological impact



- Interoperability solutions for (super) fast charging systems
- Charging energy management strategies, including 3ECOs:
 - ECO-driving
 - ECO-Charging
 - ECO-comfort
- Improved grid stabilization and quality during (fleet) charging
- Contribution in standardization for super-fast charging systems on road
- Energy efficient powertrain



Operational impact on the upscale of e-bus fleets



- **High charging power** that will reduce the charging time at terminals, enhancing fleet operation (higher frequency, more lines charged at the same terminal, etc.)
- **Interoperability** between vehicles and charging systems of different brands to ensure the deployment of e-fleets in different steps and through regular procurement processes.
 - Recommendation roadmap for interoperable fast charging solutions: interaction with the standardisation body parallel to the technical work
- **Smart charging at the depot**, enabling the efficient charging of large (+100 vehicles) fleets
- **Grid stabilization** through ASSURED smart solutions

Project Consortium



- Strengthen the European technical and technological leadership in the
- Value chain of electrified urban HD, MD and light-duty vehicles,
- 39 leading partners from 12 EU countries
- Strong collaboration and interaction with PTO's/PTA's





Thanks a lot for your attention!

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