



VDL E-MOBILITY APPROACH 13.2.2017

What is the position of VDL Bus & Coach in Europe

We are number 1 – We have the experience of over 100 electric buses on road



Eindhoven 43 SLFA-E
in single contract,
Köln 8 SLFA-E making
total 55 18m electric
in operation



12 LLE-E in operation



35 SLF-E in operation

Implementation management is crucial for all parties (PTO, PTA, OEM)

Electric bus technology is new – drivers, dispatching, officers, mechanics have to be trained and learn-by-doing

Charging management at the end stop is a new element – drivers and technology will have some operational issues at the beginning = learning phase

Limited range & charging time in operation – how does the time table planning support this if it does not go as planned in the beginning

Due to new technology other players and other requirements will pop up without a ‘natural’ owner

Management of infrastructure and shared responsibility will have its “hiccup's” in the beginning

Key element is PARTNERSHIP and joint view of the future – not finding the guilty ones



Proven concept and ready for commercial launch

...but requires strong project management and cooperation

The technology itself is proven – small issues will always pop-up

Main topic is to manage the operational (PTO) aspects in implementing bigger fleets

Limited range & charging time in operation – fine tuning of charging might be needed

Partnerships is required in order to succeed – PTO + PTA + supplier

Testing phase is needed as there are new stakeholders, during the testing there should be no penalty scheme e.g. if departure is missed. Communication internally and outside is crucial.



Testing phase

Should be linked to commercial operation after months/year of learning testing phase

As the eco-system of E-mobility is more complex, there need to be clarity of responsibilities:

- **Infra management (hardware and software)**
- **Vehicle management (project support)**
- **Operations PTO – infra**
- **PTA as controlling and making needed changes for routes/ timetables (if it needed)**
- **Form a steering group of these stakeholders and have weekly/monthly meetings**



Procurement

Can it be shared procurement / PPP project / consortium?

PTA should decide the general scope/vision of the city – line(s), end stop charging method, depot solution, interoperability, available power/grid, timetable vs. charge times, etc

PTO should have a word / decision on which brand and technological solution they choose if they do not select the brand by themselves

If the tender is separated into three different tender process:

- The risk is that partnership will be hard to achieve among all stakeholders
- There most likely need to be 2 operators: Infra operator and bus operator

⇒ **Main question is: Are PTOs ready to go for E-mobility on their own already?**

⇒ **Joint project**

⇒ normal public procurement of buses & infra separately is a challenge as there is a link between vehicle and charging infra

⇒ B2B approach is more flexible if there is a need to re-negotiate / adjust during the process / piloting / testing phase

⇒ PTO has long history of purchasing and knowing the technical challenges of the bus fleet and maintenance

⇒ **PTA should seek a electric transport solution and PTO will think the smartest/best way to do it**

System test and delivery capability 2018-2020

To evaluate the E-mobility matureness, there need to be different OEMs with more than 10 electric buses each in order to make it big enough for all the stakeholders and to ensure interoperability of buses and infra.

Duration should be 6-12 months and after that go for commercial traffic. The actual test phase is only a “rehearsal” towards normal operation with EV fleet if key targets are met. Not an 2-year test only.

Test phase should be based on daily normal mileage and operation with hard peak hour traffic in city lines in order to “push to the limits”.

Timetable:

1. Tender Q1/2018 for bus operators (and infra if needed)
2. Orders in Q3/2018 for bus and infra suppliers
3. Building of buses and infra Q3/2018-Q2/2019
4. Testing of the system Q3/2019 – Q2/2020
5. In normal operation from Q3/2020

Director of E-mobility Nordics, Sami Ojamo, s.ojamo@vdlbuscoach.fi

