

CEM-EVI Pilot City Forum – Helsinki – 28th May 2018

ZeEUS and the clean bus deployment

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1.

What is ZeEUS about?

Project Keyfacts

Bringing electrification to the heart of public transport

Support electric bus deployment (2013-2018)



40 Consortium Partners
20 User Group Members
Coordinator: UITP



22,5 million€
EU funding: 13,5 million €



10 demo cities
>107 electric buses



1 common evaluation methodology



A set of tools and guidelines to accompany bus stakeholders in ebus deployment

ZeEUS Demo Cities (10 cities, >100 eBuses)

High capacity buses:

- 12 meters
- Articulated
- Double-deckers

Different e-type:

- Plug-in Hybrid
- Full-electric
- Battery Trolleys

Energy supply modes:

- Plug-in
- Inductive
- Conductive (pantograph)
- Overhead (trolley)

Fast and slow charging strategies:

- Overnight (depot)
- Opportunity (terminals)
- On-route (trolley)



ZeEUS eBus Performances

ZERO EMISSION URBAN BUS SYSTEM (ZeEUS) PROJECT

For the period Aug 2015 – Jan 2018

Figures coming from **10** cities across Europe



5.661.126

km

The distance travelled by ZeEUS buses running in pure electric mode¹



2.151.228

litres²

The amount of diesel fuel saved by the ZeEUS bus project¹



3.273 tons³

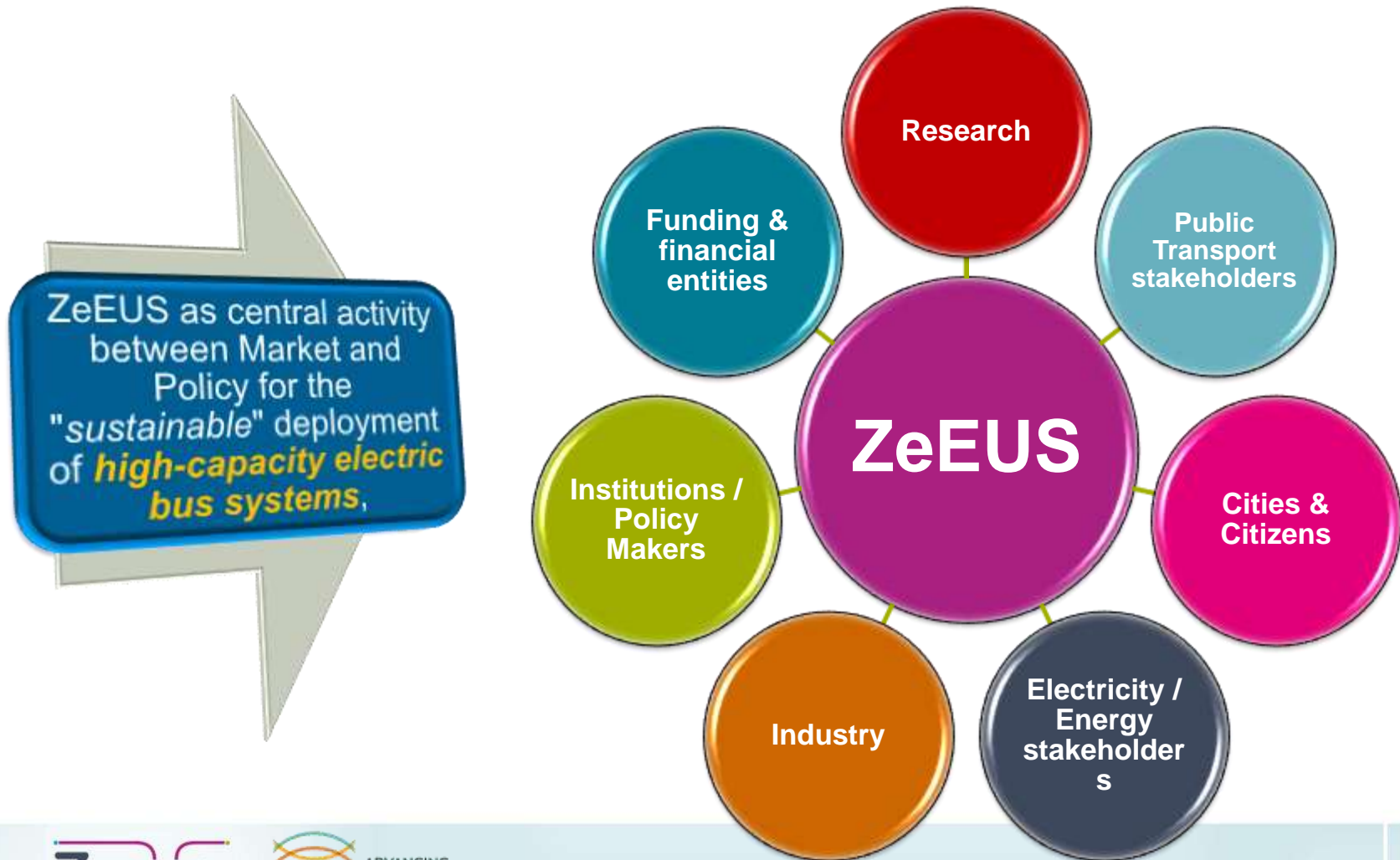
The amount of carbon dioxide emissions prevented by the ZeEUS bus project¹

¹ For vehicles increasing from 12 (2015) to 109 buses (84 BEV, 11 PHEV, 6 Trolley-Battery)

² Assuming 38l/100km

³ ISO 16258 factor for Diesel/GaBi factor for national grid mixes (2014) and diesel supply

ZeEUS: Flagship EU Project on urban e-bus systems



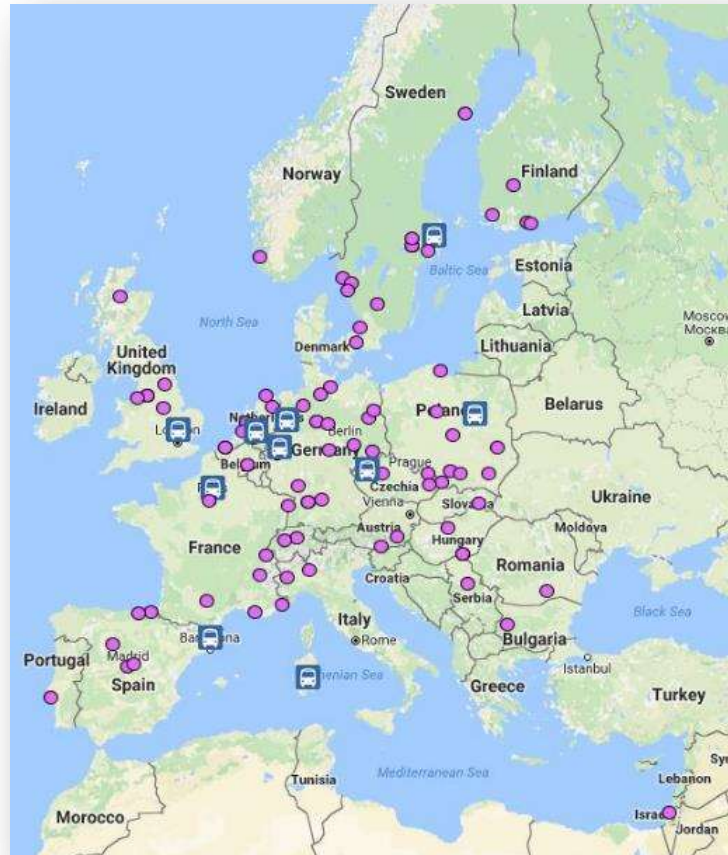
ZeEUS: A large platform of collaboration!

+ 100 Organisations and Companies

PTA/ PTO/ Cities

10 core demos
20 user groups
90 observed
3 monitored

800 Buses



Vehicle Manufacturers

5 Project Partners +
4 Suppliers
8 E-SORT WG +
32 in ZeEUS Report

8 electric
charging solution
providers

2.

Results

ZeEUS support to e-Bus Deployment

ZeEUS identified 5 main challenges for e-bus deployment



High upfront cost



New challenging operations



New ways to procure

- Vehicles & Equipments
- Operation services

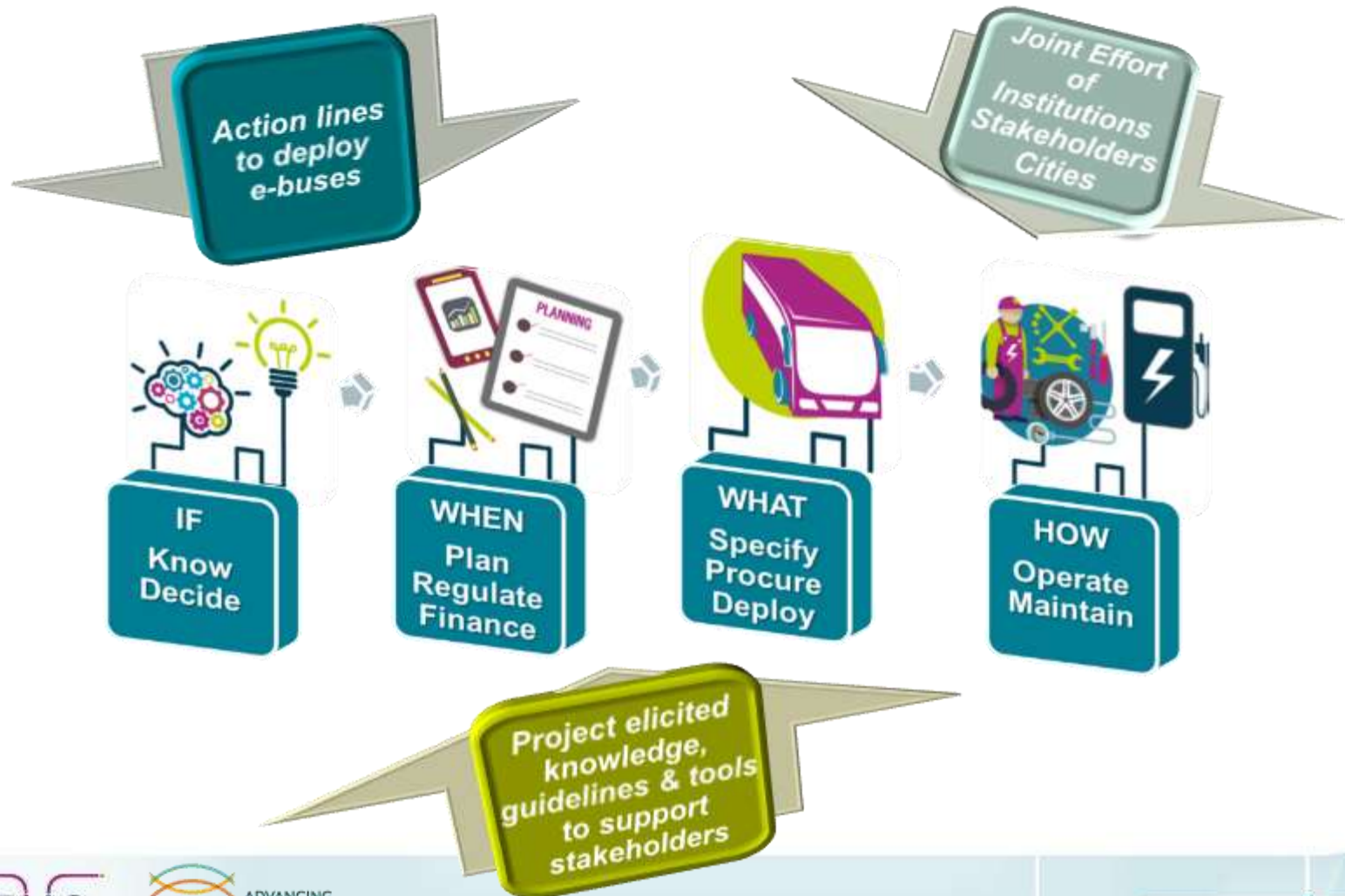


Standardisation / Interoperability



Reinforcing cooperation energy/bus

... and developed the ZeEUS Phased Approach to tackle them



Lessons learned: before ZeEUS

Early stage of knowledge on high capacity e-buses

- Project partners started “from scratch”: **“learning by doing, trial & error”** approach
- Authorities were not used to consider **e-bus as a system**
- Very **limited knowledge on how to operate** e-buses
- **Bus technology greatly developed** since proposal phase



After ZeEUS

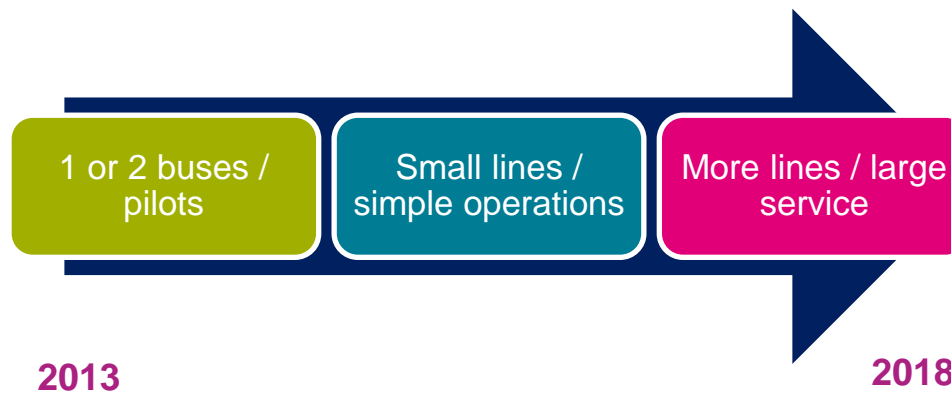
Gradual vehicle introduction in function of knowledge, technology chosen to **ensure service operation**

- Paradigm shift: **from vehicle procurement to system procurement**
- Early **stakeholder involvement** in the planning, joint feasibility study.
- **IT supporting fleet monitoring** to optimise operation.
- Identification of main elements needed for “**local**” **LCC** model.
- Integrating e-bus services into the global **decarbonisation strategy**.

3.

Next Step: Fleet Upscale

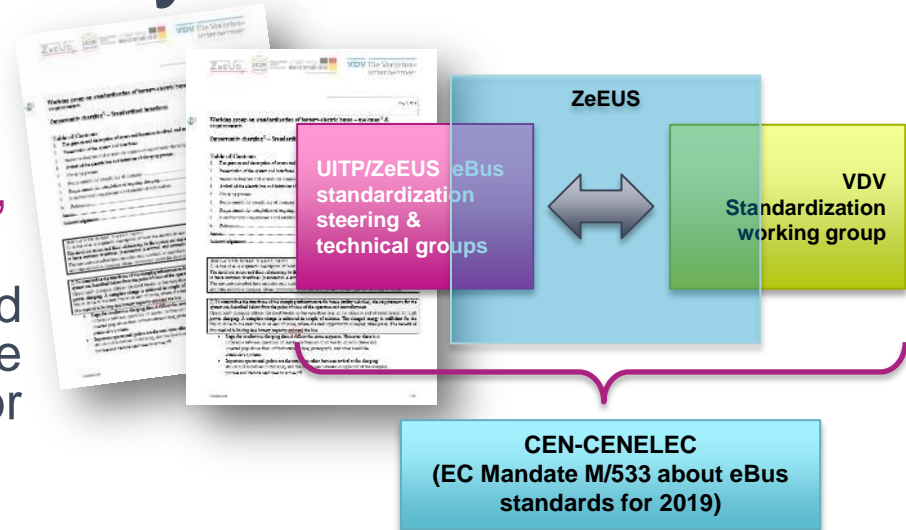
From ZeEUS to ASSURED



ZeEUS paved the way to e-fleet upscale

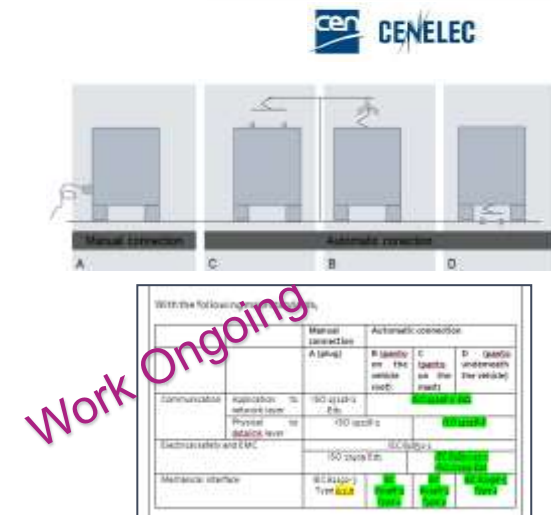
1) Electric Bus Charging Use Cases, base for standardisation

- Use Case documents prepared by UITP/VDV to understand the operation of e-buses for CEN/CENELEC.



2) Umbrella document / Roadmap

- Identification of main standards involved in the standardisation of e-bus charging systems
- Ideal roadmap for standards update / development
- Focus on 4 possible charging solutions



Boosting the integration of urban commercial electric vehicles with high power fast-charging infrastructure

- **Period:** October 2017 - September 2021 (4 years)
- **Budget:** EUR 23,7 M EUR/ **EU contribution:** EUR 18,7 M EUR
- **Partners:** 39 partners from 12 countries representing industry, research centres and local governments



3 Demonstrators for User Acceptance: PTOs, PTAs and city administrations

Barcelona
& Osnabruck

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

Goteborg

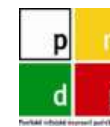
- Interoperability between bus and urban trucks

Eindhoven &
Jaworzno

- Smart charging management for fleet upscale

“The market uptake of electric buses in Europe has been one of the core objectives of ZeEUS. The next challenging step is the deployment of larger fleets and their integration with high-power, interoperable fast charging infrastructure”.

Umberto Guida
ZeEUS Project Director



Thank You!

Kiitos paljon!

