



# The TCO question: what does matter for bus operators?

**Sustainable Bus webinar – New technologies, new economics: Costs, trends, and tools for the transition to zero emission buses**

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# THE INTERNATIONAL ASSOCIATION OF PUBLIC TRANSPORT



# ➤ THE BUS SECTOR TODAY

## **Challenges faced by operators amidst the COVID-19 pandemic**

- Reduced ridership and revenues vs plans for fleet renewal
- CAPEX investment for clean bus and depot upgrade is high
- Need of suitable business models based on fair risk sharing and solid cooperation PTA/PTO to minimise technological risk and financial impact on operators' side

## **Introduction of e-buses is a golden opportunity**

- To rethink and optimise the current system
- To revamp the image of the urban bus (innovation, comfort, environmental friendliness)
- Gain back passengers' trust on PT in the post-pandemic period

# ➤ TCO FOR E-BUS OPERATORS

The deployment of e-buses raises questions of costs of the buses and the system related.

Two main questions:

- How much does it cost?
- What is the most efficient solution regarding to local context?

Situation of the TCO question:

- From what point of view (who looks at it)
- For what purpose (what and why)



# TCO FOR E-BUS OPERATORS

UITP is working on best practices exchange around communalities of TCO thinking :

- Defining of Input parameters affecting the costs
- Detailing CAPEX and OPEX impacts

This work aims to explain and share the concepts to help to define local TCO for authorities or operators

All input parameters are clustered in 3 main types:

- Infrastructure costs, from grid to chargers
- Vehicle and battery costs, energy and maintenance savings
- Operational costs related to new constraints (autonomy, charging time...)

Positive externalities must be added to the model!

# ➤ E-BUSES HAVE LARGE ECONOMIC IMPACTS AND HIGH UP-FRONT COSTS



**Upfront capital costs  
x2 – x3 higher**

Buses

Batteries

Chargers

Grid connections

(transition costs – eg  
training +  
redundancy)

**Total cost of  
Ownership  
approaching parity  
with diesel**

Fiscal regime

Capital grants

Operating grants

Asset life

Operating costs

**Assets may last  
longer**

Less vibration

Fewer moving parts  
in drivetrain

Experience with  
trolleybuses

**Are batteries a  
capital item or  
revenue item?**

Allocate risk

P&L and balance  
sheet

Disposal and  
recycling

Life

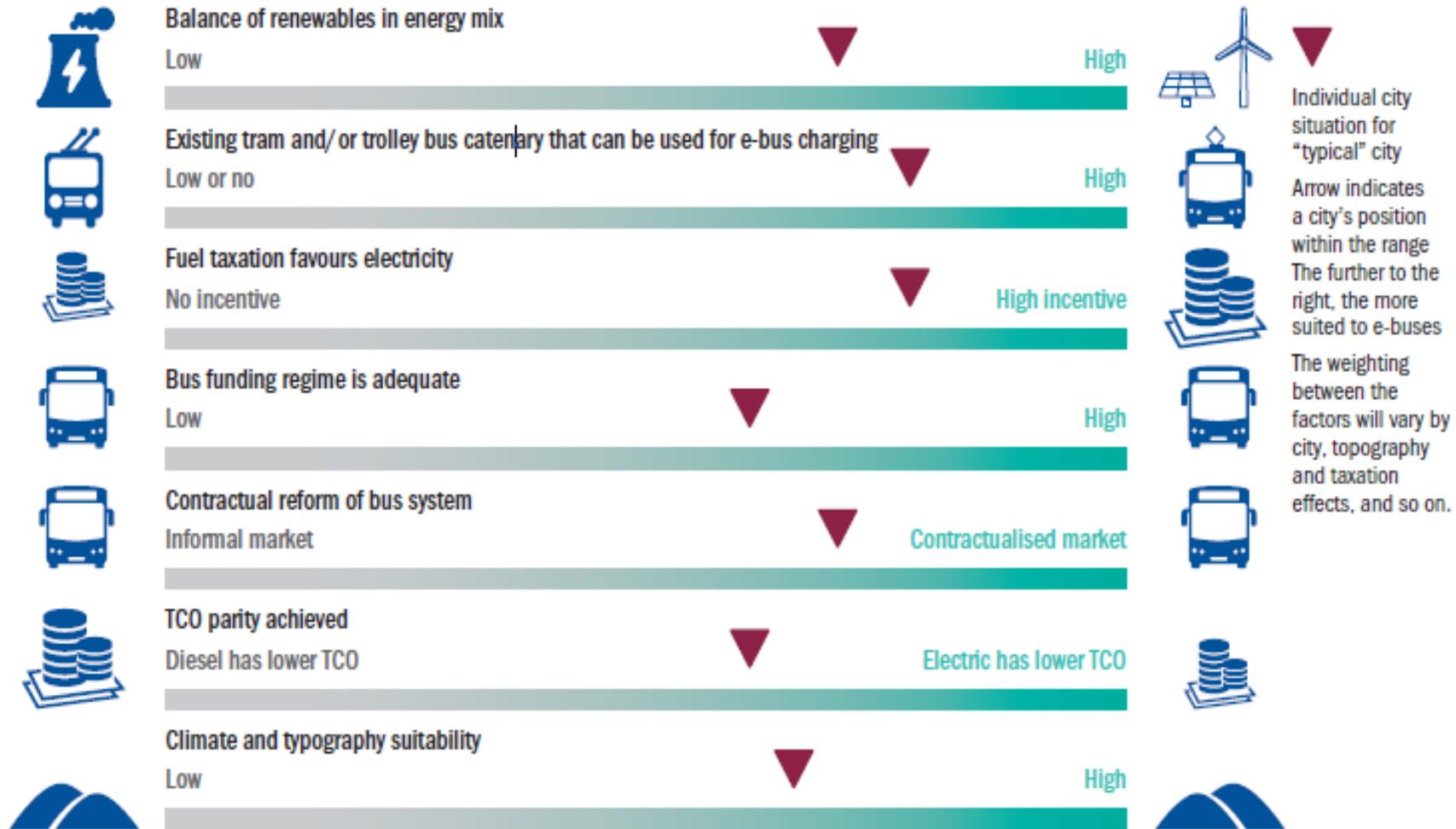
Replacement cost

**"Biggest economic change in bus technology since end of horse buses in 1910"**



# FACTORS AFFECTING TCO

Figure 10. Factors favouring e-bus TCO outcomes



Source : Global Forum - Going Electric: A pathway to zero-emission buses (EBRD, TIL, GIZ, UITP)



# ➤ IMPACT TO OPERATOR'S BUSINESS MODELS

## Collaboration between transport authorities and operators

- Electrification requires a good strategy and an efficient delivery to cope with all the changes.
- Pre-invitation to Tender (ITT) consultations with interested bidders to influence design of tender are advisable.
- Transport authorities should encourage fostering of innovation, research and development, and interfacing with start-ups for technological developments.





# THANK YOU!



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