

## About CTT Nord

### Where CTT works

CTT manages public road transport in the north of the Tuscany region.



## About CTT Nord

### Some important numbers:

- 32,9 millions of kilometers per year;
- 4 Provinces: Livorno, Pisa, Lucca, Massa;
- 767 bus;
- drivers staff n° 1077;
- Mechanical staff n° 144;
- **Total staff 1438**



## First question: What went well in the tendering process of ebusses?

**Today public economic resources are available for the bus electric transition in Tuscany:**

- 35 million euros have already been placed: Livorno 13M€; Lucca 8M€ ;Prato 14M€ (excluding Florence with dedicated financing);
- 100% Public capital are available to purchase buses and charging infrastructure.



In the past, transition projects have failed due to resource-limiting and insufficiently capable lead-acid batteries.

**Today aware of the mistakes made in the past, we want to reduce all direct and indirect risk.**

**We have carried out specify pre-tests for the new electrical transition, to identify the weak points of this process, therefore the next tenders will have to limit these weaknesses**



## About specify pre-tests for the electrical transition

- 1) All buses have been **ballasted** at full load;
- 2) Engage on the line **by performing the real service with stops and go;**
- 3) **Mission per day** 12 mt = 260 km, 9 mt = 240 km, 6 mt = 220 km;

## Out put test: check battery life vs time and km.

### E-bus tested:

- BYD 9 and 12 mt
- E way 9 and 12 mt
- Solaris 12 mt
- Youtong 12 mt
- Rampini 6 mt



**RESULTS**

## Main results:

The weakest point of the e-bus is the **battery** in terms of **limited life** compared to the useful **life of the bus**.

Our **road tests revealed** a substantial difference between the different types of battery that produces a **maximum life forecast around 5/6 years**.

The cause of this capacity reduction is also due to the **high daily kilometers need of produce near of technical battery limits**.

**Notes:** only night recharge in storage, not possible in-line recharge with pantograph for impossibility of urban infrastructure constraints.





The main risk in a e-bus tendering process is to load additional cost of changing batteries after only 6 years.

This cost aren't covered from the Public capital therefore **will be a direct risk to the operator (unwanted cost )**.

For CTT we estimate in the year 2025/6 **7 Milions of Euro only for changing batteries** (unwanted cost ).

**To avoid these unwanted cost we are working on tenders for promoting formulas other than the classic tendering process.**

### 3 ways for e-Bus purchase formulas:

- 1) e-bus with **own battery**, standard solution;
- 2) e-bus with **rent battery** (leasing solution bus not financeable);
- 3) e-bus with **own battery + extra warranty @ 12 years** (in practice the bus company **accepts the risk of changing the battery increasing the cost of the first installation** (financeable solution))



The third solution allows you to **limit the costs of the second battery change without having to decide** what to do when the battery expires, obviously up to 12 years.



## Second question: What will happen regarding the corona situation?

Surely protect the driver's seat with dedicated boxes integrated with the vehicle in terms of microclimate and air filtration in e bus.

before



after



## Third question: What steps do you need to take for upscaling?

- Push **bus manufacturer** to apply the **battery guarantee formula in the long term.**
- Push **Ministry of Transp.** to distributed all **resources to the Regions quickly**

# thanks for your attention

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