



CONTEXT



In the ***historic inner-city area of Rome*** **25.000** vehicles are operating daily; **60%** of those vehicles (**15.000**) generate **35.000** loading/unloading activities, while the remaining **40%** cross the inner-city area without stopping*.....

MISSIONS & MAIN GOALS

" Implement a new logistics model at zero emissions (CO₂), with a break-even energy balance and economic savings prospects for the distribution of FMCG (beverage), within large metropolitan areas and Limited Traffic Zones of Rome through the integrated use of renewable energy sources and innovative technologies "

1. *To Certify ZED project as the best logistics solution for distribution in the LTZ* within the environmental/eco-sustainable field (CO₂=0);*
2. *To Develop repeatable/reproducible ZED projects;*
3. *To Reach a BEP (break-even point) < 3 years;*
4. *To Achieve operative costs savings compared to the "traditional logistics model" (15-20%) .*

* LTZ = Limited Traffic Zone



PROJECT DESCRIPTION

Deliver more than **200-400 shipments** per day in the LTZ zones of Rome by a warehouse located at **15 km** from the city center (GRA - Tiburtina area)

The electric vehicles will have an autonomy of **140 km** and the possibility to exceed slopes greater than **21%**. The electric vehicles will deliver in the LTZ even **2 times x day**



The warehouse will be covered by **1.000-1.200 square meters** of photovoltaic panels and it will supply energy (DC) to **6 electric vehicles** and to some fast-charging towers

FOCUS RESEARCH

- ✓ *HUBs and TPs powered by photovoltaic energy panels: recovery/energy savings with the elimination of losses due to the absorption of the inverters in double conversion between direct and alternating current (DC –AC) and vice versa for battery recharging*
- ✓ *Fast -charging electric vehicles charging station for electric vehicles (goal 50-60 minutes)*
- ✓ *Designing energy integral logistics platforms → Energy Performance of Buildings Directive*



FOCUS RESEARCH

- ✓ *Stations for quick replacement of batteries for electric vehicles*
- ✓ *"Smart" dashboard for monitoring the entire logistics-distribution model (ZED)*
- ✓ *New power train (a new concept of Battery Management System)*



MODEL REPRESENTATION

1 - HUB/TP WITH PHOTOVOLTAIC PANELS



3 - ELECTRIC VEHICLES



CONTROL ROOM



2 - FAST CHARGING TOWERS



CHARACTERISTICS OF THE ELECTRIC VEHICLE




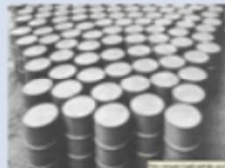

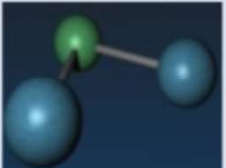


- GROSS WEIGHT: 5,5 T
- PAYLOAD: 2,5 T
- AUTONOMY: 140 KM
- MAX SPEED: 80 KM/H

- BATTERY PACK: IONI LITIO FERRITE* (80 CELLS)
- SLOPES: 21%
- RECHARGE: 7-8 H
- BP LIFE CYCLE: 2.500

* TEST ON: IONI LITIO POLIMERI



COSTS & BENEFITS

MIA Mancato Impatto Ambientale				
<i>Emissioni evitate</i>	<i>CO2</i>	<i>TEP</i> (t/anno)	<i>NOx</i>	<i>SO2</i>
<i>[kg/anno]</i>	1.517.811	517	3.373	3.148
<i>[t/25anni]</i>	36.829	12.549	82	76
   				
<i>Rimboschimento equivalente</i>	<i>Ha/anno</i>			
	205			

The implementation of the ZED project entails a reduction in CO_2 emission the effect of which corresponds to a reforestation of about **205 hectares** (to be confirmed)

ZED IN ROME...

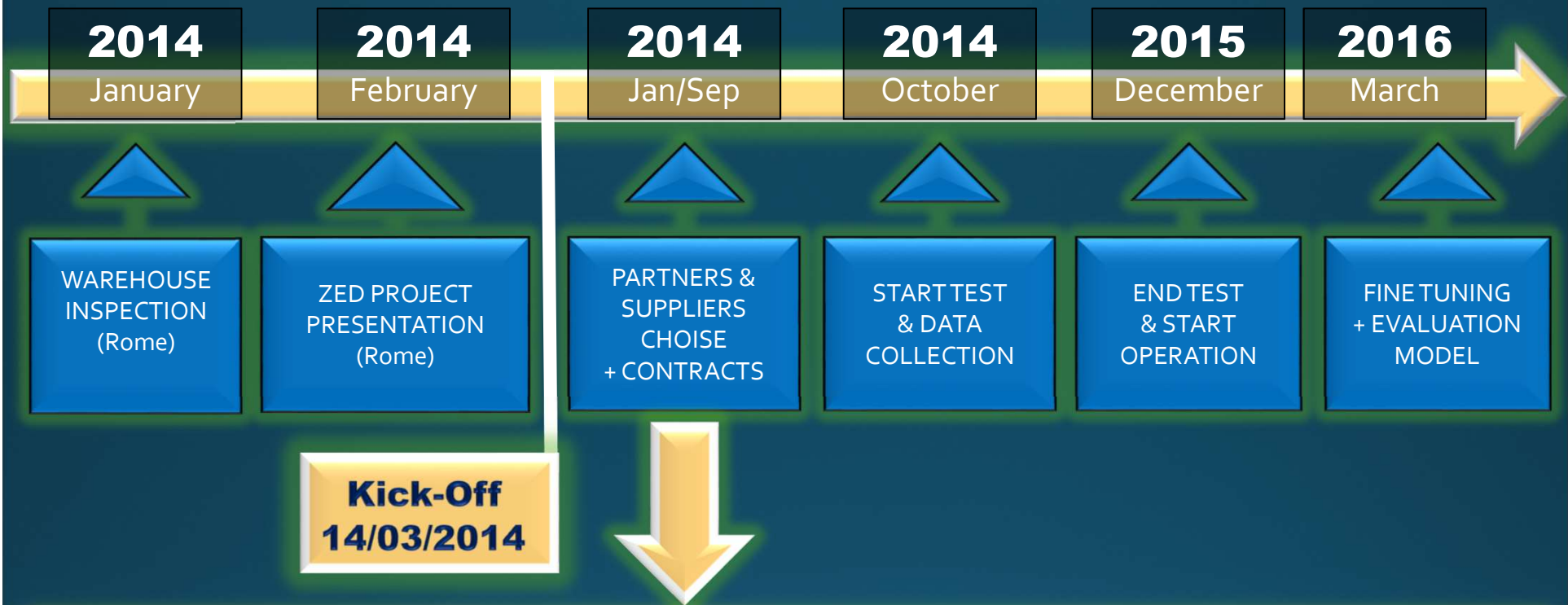
Since October, the first electric vehicle has started to operate in the center of Rome (Limited Traffic Zone), the second EV in March and the fleet in October 2015 ...



OPERATIVE PARTNERS



CHRONOGRAM



- ***Choice of supplier for: electric vehicles, PV moduls, fast charging towers, etc.***
 - ***Contracts alignments...***
- ***Definition of the timing research activities (BMS)***



www.mancinelli.biz



www.logisticazed.it