LIFE E-VIA

LIFE18 ENV/IT/000201

With the contribution of the LIFE programme of the European Union

Electric Vehicle noIse control by Assessment and optimisation of tyre/road interaction

Background

Exposure data from the European Environment Agency (EEA) demonstrate that more than 100 million EU citizens are affected by high noise levels negatively impacting human health. Traffic noise alone is harmful to the health of almost every third person in the WHO (World Health Organization) European Region. 20% of Europeans are regularly exposed to night sound levels that could significantly damage health, especially in urban areas. As emerged in Noise in Europe Conference (April 2017) and in the WHO guidelines published in October 2018, the increased stringency of EU at source standards needs to be balanced against other effective measures such as road surface and/or tyre improvements and urban planning measures as well.
One of the solutions universally recognized as the best to reduce noise in urban areas, from both the point of view of noise and air quality, is the introduction of **electric mobility**. Thus, for the changed requirements of Electric Vehicles (EVs) there is a need for in-depth investigations of tyre/road interaction. Last but not least, even for the application of the Directive 2002/49/EC, the coefficients to apply the CNOSSOS model (Directive 996/2015/EC) to new traffic spectra and new vehicles are completely missing.

Objectives

1. To **reduce noise** for roads inside very populated urban areas through the implementation of a mitigation measure aimed at **optimizing road surfaces and tyres of EVs**. Two road surfaces, at least 5 different EV types, one reference ICE Vehicle (ICEV) and at least 3 types of tyres per vehicle type (including tyres specifically designed for EVs) will be tested

2. To **estimate the mitigation efficiency** and **potential** of **tyres**, **pavements** and **traffic** (traffic spectrum, speeds, handling conditions) at a higher and comprehensive level: a Life Cycle Analysis (**LCA**) and a Life Cycle Cost Analysis (**LCCA**) will be performed to demonstrate the individual and synergistic efficiency of pavement surfaces, tyres and vehicles (including the comparison between internal combustion vehicles, mixed traffic, and EV traffic)

3. To contribute to **EU legislation effective implementation** (EU Directives 2002/49/EC and 2015/996/EC), providing rolling noise coefficients within the Common Noise Assessment Method (**CNOSSOS-EU**), specifically tuned for EVs which are actually in need of data for practitioners, agencies, and departments aiming at developing future scenarios

4. To contribute to **national and Italian regional policies**, issuing **guidelines** about use and application of the methodology output of the project, which will be adopted, through the Regional Env. Agency (ARPAT), supporting the project, by Tuscany Region. Calabria Region and Città of Reggio Calabria also expressed their interest.

5. To **raise people's awareness** of noise pollution and health effects explaining the opportunities provided by EVs through specific dissemination and promotional events, also investigating people perception regarding noise in terms of soundscape methodology and involving them in noise data acquisition.

6. To demonstrate and **promote sustainable road transport mobility (electric)**, reducing noise emission by 5 dB(A) at receivers' roadside and achieving also CO2 emissions reduction (21%), based on the Italian context (LPG, CNG, Hybrid, EV, petrol cars, diesel cars) and the concerned literature

7. To **encourage low-noise surfaces implementation in further EU and extra-EU scenarios**, demonstrating durability and sustainability, through in-depth LCA&LCCA

Actions

A. Preparatory actions
A1 Electric vehicles and their noise emission
A2 Quiet pavement technologies and their performance over time
A3 Tyre role in the new context of EV and ICEV

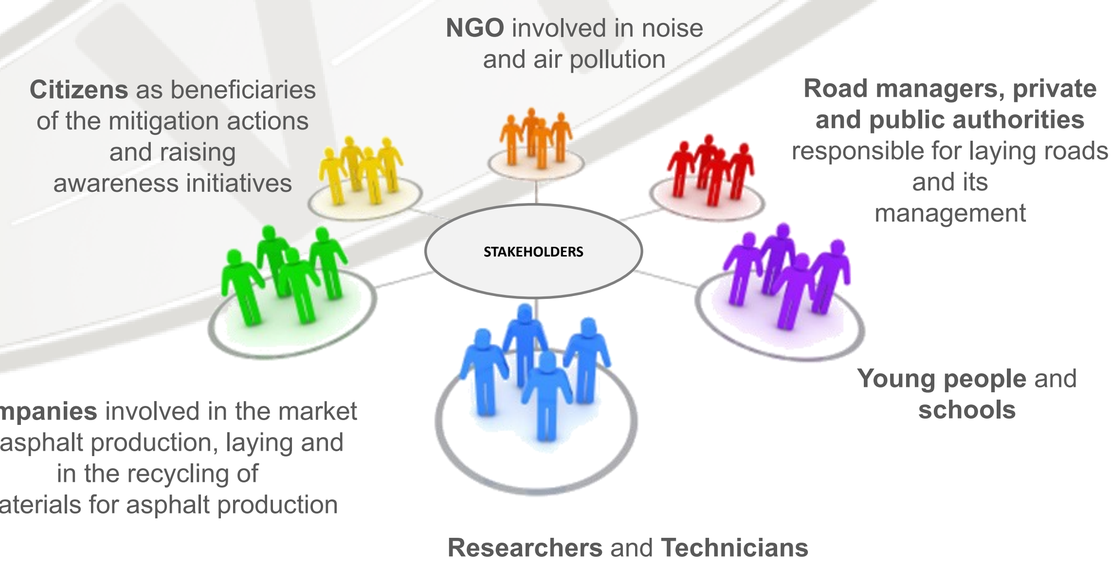
B. Implementation actions
B1 Tracks design
B2 Tyre-pavement coupling study and prototype implementation
B3 Pilot area: Implementation. Replication and transferability
B4 Track efficiency tests in the pilot area
B5 Soundscape analysis
B6 Evaluation of EV noise emissions
B7 Holistic performances of tyres

C. Monitoring of the impact of the project actions
C1 Monitoring of the impact of the project actions
C2 Life cycle analysis (LCA) and life cycle costing (LCC)

D. Public awareness and dissemination of results
D1 Information and awareness raising activities
D2 Technical dissemination activities to stakeholders

E. Project management

Stakeholders



Project website: https://life-evia.eu/