

LIFE18 ENV/IT/000201

With the contribution of the LIFE programme of the European Union

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

LIFE E-VIA



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MAIN OBJECTIVE:

To reduce noise for roads inside very populated urban areas through the implementation of mitigation measures aimed at providing optimized road surfaces and tyres for modern EVs.

PILOT AREA LOCATION: Florence, Italy

DURATION: 07/2019 - 01/2023

BUDGET: 1.8 Mio € (55% EC-funded)

PROJECT PARTNERSHIP

Coordinating Beneficiary: Florence Municipality

Associated Beneficiaries: Ipool S.r.I., Université Gustave Eiffel, University of Reggio Calabria, Vie en.ro.se Ingegneria S.r.I., Continental Reifen Deutschland GmbH





Motivation



- The LIFE E-VIA project focuses on noise pollution due to road traffic, looking at a future perspective in which electric and hybrid vehicles (EVs) will be a consistent portion of the traffic flow.
- One of the best solutions universally recognized to reduce noise in urban areas, from both the point of view of noise and air quality, is the introduction of electric mobility.
- Traffic noise mainly consists of powertrain noise and tyre/road noise (i.e. rolling noise). With the progress of modern Internal Combustion Engines (ICE) and EVs, tyre/road noise dominates after 40 kph for steady-speed traffic.

Stakeholders







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**.









2. To estimate the mitigation efficiency and potential of tyres, pavements and traffic at a higher and comprehensive level: Life Cycle Analysis (LCA) and Life Cycle Cost Analysis (LCCA) will be performed to demonstrate the individual and synergistic efficiency of pavement surfaces, tyres and vehicles.



Source: F. Praticò *et al.*, Energy and Environmental Life Cycle Assessment of Suistainable Pavement Materials and Technologies for Urban Roads, Suistainability 2020, 12, 704

-60% -40% -20% 0% 20% 40% 60% 80% 100% -60% -40% -20% 0% 20% 40% 60% 80% 100%



3. To contribute to **EU legislation effective implementation** providing rolling noise coefficients within the Common Noise Assessment Method (**CNOSSOS-EU**), specifically tuned for EVs, aiming at helping to developing **future scenarios**.



25/05/2021



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.





Source: https://www.flickr.com/photos/44534236@N00/17185363123/in/photostream/



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



Pilot Area Florence

- As a pilot implementation a section of a road in Florence will be paved with the new low-noise road surface.
- The pilot area will be the focus of further actions relating to
 - performance and wear/ageing monitoring of the new surface,
 - LCA/LCAA analysis,
 - Soundscape analysis,
 - ...
- The re-pavement of the road will also be linked to an EV festival planned to be held in Florence which shall promote Electric Mobility.









Conclusion



In Europe, the acoustic scenario at urban level is mainly characterized by road traffic noise.

In this framework, the LIFE E-VIA project proposes some prototypal solutions leading with optimal road surface for the specific context of EV fleet and tyres to be developed in order to give an optimal holistic relation between low exterior noise and other key performances.

These solutions are accompanied by soundscape analysis activities, estimation of EVs rolling noise coefficients for the local fleet in order to implementation of EU legislation, Life Cycle Analysis and Life Cycle Costing to evaluate the track efficiency from a comprehensive point of view.

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Thank you for your attention

To stay tuned on the project progresses, visit the website https://life-evia.eu/

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