



LIFE NEREiDE - Noise Efficiently REduced by
recycleD pavEments

LIFE15 ENV/IT/000268



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Project description:

Background

Noise pollution is a growing environmental concern. The Environmental Noise Directive requires the adoption of action plans to prevent and reduce environmental noise. Urban noise is, in fact, one of the main problems reported by citizens, and the World Health Organisation has repeatedly pointed out the health risks associated with exposure to noise. The Noise in Europe 2014 report highlights road traffic as the most dominant source of environmental noise, with an estimated 125 million people affected by noise levels greater than 55 dB(A). One of the most popular solutions for mitigating noise pollution in urban areas is the use of porous asphalt pavements that are soundproofed.

Objectives

The overall LIFE NEREiDE objective is to demonstrate the use of new porous asphalt pavements and low noise surfaces made of recycled asphalt from pavements and particles of rubber from scrap tyres. These materials will be mixed with binders to produce pavements with the following specific benefits:

- A reduction in the disposal of waste materials, by using recycled materials, and a reduction in the use of new materials in line with the Circular Economy Action Plan and the Roadmap to a Resource Efficient Europe;
- Improved sound performance compared with material currently available;
- Improved safety in urban areas by good textured surfaces and improved

drainage; and

- Less air pollution through the improved laying of asphalt.

The new pavements will be laid in two selected urban areas in Tuscany and tested with innovative device for measuring absorption. The effectiveness of the new surfaces will be evaluated by measuring surface characteristics and acoustic properties and by taking user surveys. A secondary objective is to develop new techniques for monitoring performances of the new pavements in order to improve the reliability of results. The effectiveness of the new asphalts will be monitored with reference to the response to noise before and after the tests.

The tests will lead to the development of specific guidelines to be used by road authorities in preparing specifications for the construction of new porous asphalt, low-noise and low-carbon footprint surfaces. Guidelines will be developed in order to upgrade and to improve the methods currently available for assessing the effectiveness of low-noise surfaces in urban areas.

Expected results:

- The recycling of around 24 000 kg of rubber from end-of-life tyres (around 4 800 tyres) for the production of at least 4 000 m of new asphalt pavements;
- Additional recycled rubber derived from the use of porous elastic road surfaces for a 400 m stretch of the new pavements;
- The use 25-50% of reclaimed asphalt pavement material in the production of the new pavements;
- Reduction of urban noise pollution in the selected sites by at least 5 dB(A) compared with traditional pavements, and 2 dB(A) compared to other traditional porous asphalt surfaces;
- Increased surface friction (more than 20%) with improvements in safety;
- New asphalt pavement shown to be laid at temperatures of 30-40°C less than the temperatures used for rubber modified asphalts, reducing by 30% the emissions of polluting polycyclic aromatic hydrocarbons; and
- A Life Cycle Assessment of the new materials, their efficiency and effectiveness in terms of noise and air pollution reduction.

Results

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Environmental issues addressed:

Themes

Air & Noise - Noise pollution

Waste - Waste recycling

Keywords

waste recycling, chemical industry, tyre, noise reduction, road construction, resource conservation

Target EU Legislation

- Waste
- Directive 2008/98 - Waste and repealing certain Directives (Waste Framework Directive) (19.11.200 ...
- COM(2015)614 - "Closing the loop - An EU action plan for the Circular Economy" (02.12.2015)
- Noise
- Directive 2002/49 - Assessment and management of environmental noise (Noise Directive) (25.06.200 ...

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	UNIVERSITA' DI PISA
Type of organisation	University
Description	The Department of Civil and Industrial Engineering at the University of Pisa consists of five existing departments (civil, mechanical, nuclear, chemical and aerospace engineering). It carries out education and research activities, both applied and theoretical.
Partners	Regione Toscana, Italy ECOPNEUS, Italy Istituto di Acustica e Sensoristica "Orso Mario Corbino" (CNR-IDASC), Italy Belgian Road Research Centre (BRRC), Belgium ARPAT-Agenzia regionale per la Protezione Ambientale della Toscana, Italy

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Administrative data:

Project reference LIFE15 ENV/IT/000268

Duration	01-SEP-2016 to 31-MAR -2020
Total budget	2,764,673.00 €
EU contribution	1,118,799.00 €
Project location	Toscana(Italia)

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