

# NEWS HEATLAND



**HEATLAND**

**Innovative pavement solution for the mitigation  
of the urban heat island effect**

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**Proyecto Heatland Life - LIFE16 CCA/ES/000077**



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## The innovative cool pavement is tested in El Ranero and La Paz neighbourhoods



Preliminary tests have been completed in El Ranero and La Paz neighbourhoods. These in-situ tests are useful to analyse mechanical resistance so that the Murcia City Council can be sure of the fact that the innovative cool pavement performance is as good as the traditional one.

It has been planned to implement this innovative cool pavement in Pío Baroja Avenue and five more streets in El Infante neighbourhood, near Segura River.

This initiative will test how good are reflective pavements in the climate change mitigation.

The consortium members are:

- CHM builder company.
- Construction Research Centre, CTCON.
- Murcia City Council.
- Regional Federation of Construction Companies, FRECOM.
- Construction Cluster of Slovenia (Slovenski Gradbeni Grozd), SGG-CCS

## Innovative cool pavement will be implemented in six streets of Murcia



LIFE HEATLAND project will reach an important milestone with the implementation of the new reflective pavement, an initiative that aims to minimize the urban heat island effect and reduce smog formation and energy consumption.

Next week, from February 3rd to 7th, the implementation will be done on an area of 24,000 m<sup>2</sup>, comprising a total of seven streets: six will be paved with the innovative cool asphalt (Monte Carmelo St, Sauce St, Carmen Conde St, Valle Inclán St, Pío Baroja Avenue and Pintor Almela Costa St) and one (Lope de Rueda St) will be paved with the traditional one in order to be able to compare measured data.

These streets will be closed to traffic on that days in order to carry out the works. An information point will be placed on February 7th and people will have the opportunity to talk to the project partners, from 11:00 to 13:00 on Pío Baroja Avenue.

## What is tropospheric ozone and why should its formation be avoided?



Ozone ( $O_3$ ) is a generally colorless and pungent odor gas, the molecule of which is made up of three oxygen atoms. The ozone layer in the upper levels of the atmosphere (stratospheric) constitutes a filter to protect against solar radiation. However, surface ozone (tropospheric) is a pollutant that has a significant impact on people's health and agricultural production.

Tropospheric ozone is not emitted directly into the atmosphere, but is a secondary pollutant formed from complex photochemical reactions in sunlight from primary pollutants, such as nitrogen oxides ( $NO_2$ ) - generated in the processes of combustion- and volatile organic compounds (VOCs) - generated in transport.

$COV + NO_2 + luz\ solar + Q > O_3$

While  $NO_2$  participates in the formation of  $O_3$ ,  $NO$  destroys it to form  $O_2$  and  $CO_2$ . For this reason, ozone levels are not as high in urban areas (where high levels of  $NO$  are emitted by internal combustion vehicles) as in rural areas near urban centers.

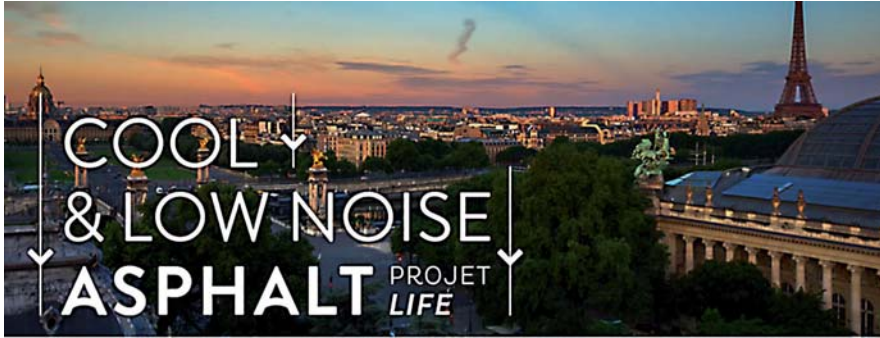
Tropospheric ozone is a powerful oxidant that produces adverse effects on human health, such as lung inflammation, lung failure, respiratory failure, asthma, and other bronchopulmonary diseases.

It can also damage vegetation, impairing plant reproduction and growth, leading to reduced biodiversity, decreased forest growth, and reduced crop yield. The most ozone-sensitive crops are cotton, lettuce, and tomatoes.

Furthermore, when present in the upper troposphere, ozone is a very effective greenhouse gas.

In Spain, tropospheric ozone levels are the most worrisome of all the monitored air quality pollutants, exceeding the objective values for the protection of health in practically the entire national territory, according to the Air Quality Assessment report in Spain 2018 from the Ministry for Ecological Transition. On the web <https://aqicn.org/map/spain/> you can see the air quality levels of stations around the world, including Spanish ones.

## What they are doing elsewhere: Paris



The Paris City Council, together with the Center for Technical Assessment of the sound environment (Bruit Paris) and the companies Colas and Eurovia are carrying out the project "Cool & Low Noise Asphalt" consisting of the development of various bituminous formulas aimed at reducing the heat island and noise effect in cities, which will test and monitor on approximately 600 m of surface spread over 3 areas of Paris.

The project will culminate in 2017 after studying the monitoring data collected by the measurement points.

They expect to reduce the ambient air temperature by 2°C and the ambient noise level by 3 dB.

More information at <https://www.life-asphalt.eu/>

## Not only the forests are burning, but also our cities!



Australia's wildfires have caused a lot of damage and very fast, over a very wide area. It also happened in California last year. Is this the new normal?

We know that the damage is being caused by global warming. Climate change dramatically increases the risk of extreme weather events and their intensity. The question of whether any specific climate event is directly attributable to climate change is no longer relevant. Floods, storms, droughts, heat waves, and snow storms are being taken to new extremes by more energy in the

atmosphere.

We saw smoke covering the Sydney Harbor Bridge, and the tennis players were forced to leave the matches because they couldn't breathe. Those are the immediate visible impacts, but what about the effects of constant high temperatures?

Global heating has implications for where we live. Throughout the world, cities are subject to what is known as the urban heat island; where urbanized areas experience much higher temperatures than their rural surroundings. We build our cities from glass, steel, concrete and asphalt. Materials that absorb and retain heat. We fill our cities with heating and lighting, industry and commerce, transportation and entertainment. They all push residual heat into the city's body and temperatures rise.

Read the full story at: <https://miller-klein.com/2020/01/21/its-not-just-the-forests-that-are-burning-its-our-cities/>



## LIFE HEATLAND project comes true

After months of uncertainty due to inclement weather experienced on the Spanish Levante coast that affected the new production plant, the partners of the LIFE HEATLAND project managed to achieve their goal and implement the new reflective chipboard.



Work has been carried out on an area of 24,000 m<sup>2</sup>, comprising a total of seven streets: six paved with the innovative cool asphalt (Monte Carmelo St, Sauce St, Carmen Conde St, Valle Inclán St, Pío Baroja Avenue and Pintor Almela Costa St) and one (Lope de Rueda St) paved with the traditional one in order to be able to compare measured data.

During the execution of the works, the Murcia City Council, together with the rest of the partners, made available to the residents of the area an information point about the project, which was attended by around fifty to learn more about the project.



Mayor José Ballesta gave a press conference on one of the streets paved with the new reflective asphalt. They were present at the inauguration, in addition to the mayor, Mercedes Bernabé, Councilor for Urban Agenda and Open Government, Antonio Ruiz, President of the Board of Infante D. Juan Manuel District, Antonio Trigueros, CTCON Director, David Nicolás, CHM representative, and Gustavo García, Secretary of FRECOM.



After reaching this important milestone in the project, 12 months of street monitoring are ahead to determine the degree of mitigation of the urban heat island effect, changes in air pollutants and street lighting,



## First results (February 2020)

One week after the completion of the implementation of the reflective pavement of the LIFE HEATLAND project in 6 streets in the Infante D. Juan Manuel neighbourhood, some initial results can be extracted.

- The solar reflectance (SR) that has been obtained in the reflective pavement has been approximately 39%, while that of the conventional / black has been 6%.
- The luminance (light feeling) on the streets with reflective asphalt has increased more than 50% with respect to the values obtained previously.
- The noise generated by traffic has decreased significantly after the paving spread, by 3 dB.
- The obtained temperature values, at 26°C of ambient temperature and 650 W/m<sup>2</sup>, of solar radiation, with thermographies, average temperature differences of 8.5 °C are observed between reflective and conventional asphalt, with peaks of more than 10 °C. In the summer period solar radiation can reach values of 1000 W/m<sup>2</sup>, so an increase in the temperature difference values found can be expected.
- The results of the tests carried out on the mixtures manufactured in the demonstrator to verify their mechanical behaviour, and defined in article 543 of the PG-3, have been satisfactory.

12 months of street monitoring are ahead to determine the final degree of mitigation of the urban heat island effect, changes in atmospheric pollutants and street lighting, among others.

FEB19/FEB20	PRE	POST	
	TRADICIONAL	TRADICIONAL	REFLECTANTE
TEMPERATURA MEDIA	-	39,0 °C	31,6 °C
TEMPERATURA PICO	-	41,1 °C	29,6 °C
REFLECTANCIA SOLAR	-	6 %	39 %
LUMINANCIA	2 cd/m <sup>2</sup>	1 cd/m <sup>2</sup>	3-4 cd/m <sup>2</sup>
PRESIÓN SONORA	53 dB	50 dB	50 dB
CONTAMINANTES	-	-	-

## LIFE HEATLAND Project Partner Meeting

Last week, the partners of the LIFE HEATLAND project had a follow-up meeting after the completion of the implementation works for the new pavement. The visual results are more than satisfactory and the neighbors are quite happy with the noise reduction achieved (3 dB). We have managed to decrease the average temperature of the road surface by 8°C and increase the street lighting at night by more than 50%.

We still have an intense year of monitoring parameters and studying the impact of the project.

None of this would have been possible without the co-funding of the LIFE Programme, nor without the participation of the Murcia Region Construction Technology Center, CHM Infrastructure, Murcia City Council, the Murcia Regional Federation of Construction Companies and the Construction Cluster of Slovenia.



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