



CMA+ - PM10 reduction by the application of liquid Calcium-Magnesium Acetate (CMA) in the Austrian and Italian cities Klagenfurt, Bruneck and Lienz

LIFE07 ENV/A/000003

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Project description:

Background

Numerous studies have confirmed the correlation between the concentration of particulate matter (PM) with respiratory disease, heart/circulation disorders and premature death. It is not only fine and ultrafine particles, found in PM_{2.5}, but also the coarse fraction found in PM₁₀ that can cause negative health effects. This project focuses on reducing PM₁₀ in the polluted zones of the city of Klagenfurt and the town of Lienz in Austria, as well as the Italian town of Bruneck (Brunico). PM₁₀ consists mainly of re-suspended particles from sources such as traffic, domestic burning, construction sites and unpaved roads. Road cleaning measures have produced only limited improvements in the amount of particulate matter re-suspended in the air. The limit for PM₁₀ particles of 50µg/m³ as defined by the European Directive 1999/39/EG is exceeded on more than 80 days per year in Klagenfurt and 50 days per year in Lienz and Bruneck. The limits are particularly difficult to meet in many urban areas during the cold months from September to March. The project intends to look at the use of Calcium-Magnesium Acetate (CMA) as a dust-binder. CMA is currently used as a de-icing agent for road surfaces and is an environmentally friendly alternative to chlorides. While CMA is fully biodegradable, non-corrosive and harmless to plants, soil or aquifers its high cost means that it is not widely used.

Objectives

The 'CMA+' project aimed to improve the air quality in the three target municipalities by reducing PM₁₀ re-suspension through use of liquid CMA as a dust-binder on roads, construction sites and unpaved roads. The project's target was to reduce re-suspension by up to 30% and PM₁₀ levels in the ambient air by

up to 10% (related to the annual mean) around roads. In addition, the project aimed to reduce PM10 levels by up to 50% around construction sites or unpaved roads. A major task was to overcome any traffic safety issues on roads emerging from the use of CMA. When tyre grip on the road was reduced after surface treatment, the project defined and implemented measures to compensate for situations where there was a reduction in tyre grip on the road after surface treatment. Further studies were also carried out on emerging factors generating re-suspended particles on various types of road and construction sites. The project worked to replace chlorides as a road de-icing agent with the environmentally-friendly CMA-solution in the targeted urban areas. A cost-benefit analysis of the use of CMA was carried out, along with a specific lifecycle comparison with the use of chlorides. The beneficiary published an instruction manual to encourage the use of CMA as a dust binder and de-icing agent in other cities and municipalities in Europe. This will raise acceptance and encourage the implementation of the innovative use of liquid CMA.

Results

The project tested CMA in different situations (summer/ winter, paved/ unpaved streets/ tunnels, dust-binding/ de-icing, laboratories/ cities, different application methods, with and without potassium formate) and investigated technical optimisation (agent and application method), effect on the fine dust in the air, safety aspects and (importantly) carried out an ecological and economic cost-benefit analysis. The CMA+ project was successful and will continue to run after LIFE funding ends. In 2012, Klagenfurt kept the number of days when fine particles exceeded the 50µg/m³ limit to 27 (the first time it had been below 35 days). In Lienz, the number of days when the threshold was exceeded fell from 63 in 2006 to 10 in 2011. In Bruneck, PM levels never exceeded the limits.

The project showed that CMA can reduce fine dust on the street by 10-20% (of the non-exhaust share of PM) and on unpaved roads by up to 50% in terms of half-hourly averages or 40% in terms of daily average. For paved roads this translates to 1-4 µg/m³ PM10 on the days of CMA application and about 3-13% of the annual average. Thus CMA application had a considerable effect on overall annual emissions on those relatively few days that make up the bulk of the annual PM load. The cost-benefit analysis conducted by the project gives quantified and costed values for several scenarios of CMA impact on health. The main finding was that applying CMA on main roads in Klagenfurt leads to savings in the health sector that are higher than the costs of application for a CMA application on the main streets in Klagenfurt show that the savings in the health sector are much higher than the costs of CMA application. An instruction manual is available for interested authorities to download from the project website. The beneficiary also intends to produce a report for experts on the effects of particulate matter on air quality, based on the project's findings.

Further information on the project can be found in the project's layman report and After-LIFE Communication Plan (see "Read more" section).

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Environmental issues addressed:

Themes

Air & Noise - Air quality monitoring

Land-use & Planning - Transport planning - Traffic monitoring

Keywords

urban area, emission reduction, air pollution, traffic emission

Natura 2000 sites

Not applicable

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Beneficiaries:

Coordinator	City of Klagenfurt
Type of organisation	Local authority
Description	The beneficiary is the municipal authority of Klagenfurt - the provincial capital of Carinthia in Austria. The project in particular entails the involvement of the Environmental Protection department and the road traffic and construction department.
Partners	Stadtgemeinde Bruneck, Italy Stadtgemeinde Lienz, Austria dropped out: Chemson, Austria Technische Universität (TU) Graz, Austria VTI (Swedish National Road and Transport Research Institute), Sweden Nordisk Aluminat, Denmark

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Administrative data:

Project reference	LIFE07 ENV/A/000003
Duration	01-JAN-2009 to 30-SEP -2012
Total budget	2,720,033.00 €
EU contribution	1,344,966.00 €

Project location

Kärnten(Österreich)

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Read more:

Project web site

[Project's website \(DE/EN\)](#)

Publication: After-LIFE
Communication Plan

Title: AFter-LIFE Communication Plan
Year: 2012 No of pages: 6

Publication: Layman report

Title: Layman report Author: Dr. Wolfgang
Hafner Year: 2012 No of pages: 32

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Video link

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