



# Climate and Clean Air in Latin American Cities – Plus (CALAC+)

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Schweizerische Eidgenossenschaft  
Confédération suisse  
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Agencia Suiza para el Desarrollo  
y la Cooperación COSUDE



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# At the beginning of the project...

## Mexico City

City buses and delivery trucks with DPF (self regulation)

Testing with DPF in construction machinery



[www.ciudadmexico.com.mx/](http://www.ciudadmexico.com.mx/)

[www.guiamexico.com.mx/](http://www.guiamexico.com.mx/)

## Lima

Metropolitano Buses operated with NGV

First electro bus – under test

Compliance with the 50 ppm diesel sulphur standard



[www.metropolitano.com.pe/](http://www.metropolitano.com.pe/)

## Bogotá

BRT Transmilenio operates with diesel

Sulphur standard in 50 ppm diesel, only

Medellin had 20 ppm diesel



[www.transmilenio.gov.co/](http://www.transmilenio.gov.co/)

## Santiago

3000 city buses with particle filters

Entry of electric buses and DPF in construction machinery, mandatory for urban areas from 2019



[www.transantiago.cl/](http://www.transantiago.cl/)

[www.viarural.cl/](http://www.viarural.cl/)



# Outcome 1 – Cleaner urban transport

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## Objective:

To ensure that emissions of ultra-fine particles, black carbon and greenhouse gases from urban transport systems are significantly and sustainably reduced.



# Outcome 1 – Cleaner urban transport

- Cost benefit study (environment and health) for migrating from Euro IV to Euro VI technology (Peru).
- Introduction of Euro VI/EPA-10 in public transport, good practices for the use of DPF in buses (Mexico).
- Technical support for a public policy on clean fleet, vehicle labelling, best practices in technical inspection plants (Colombia).
- General Analysis of Economic and Social Impacts to introduce NP testing, evaluation of the performance of the electrical fleet in operation, life cycle assessment of electric buses versus Euro VI (Chile).





## Outcome 2 - Policy incubators for non-road mobile machinery (NRMM)

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### Objective:

To support the development of policies for a significant reduction of ultrafine particles, black carbon and greenhouse gases in the building and industry sectors.



## Outcome 2 - Policy incubator for non-road mobile machinery

- Technical support for the elaboration of the first machinery emissions regulation in the country (Colombia).
- Preparation (Peru and Colombia) and update of machinery and emissions inventories, compliance with internal targets for emissions reduction (Chile and Mexico).
- Tender for the procurement of DPFs for the Ministry of Public Works machinery operating in Santiago, based on the guidelines developed under the project.
- Preparation of guidelines for the use of DPF filters, technical criteria to be applied in tenders (also applies to buses), etc.





## Outcome 3 – Regional and global cooperation

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### Objective:

To share, at regional and global level, the systematized experience: successful policies, actions and profitable technologies that reduce fuel consumption and black carbon emissions.



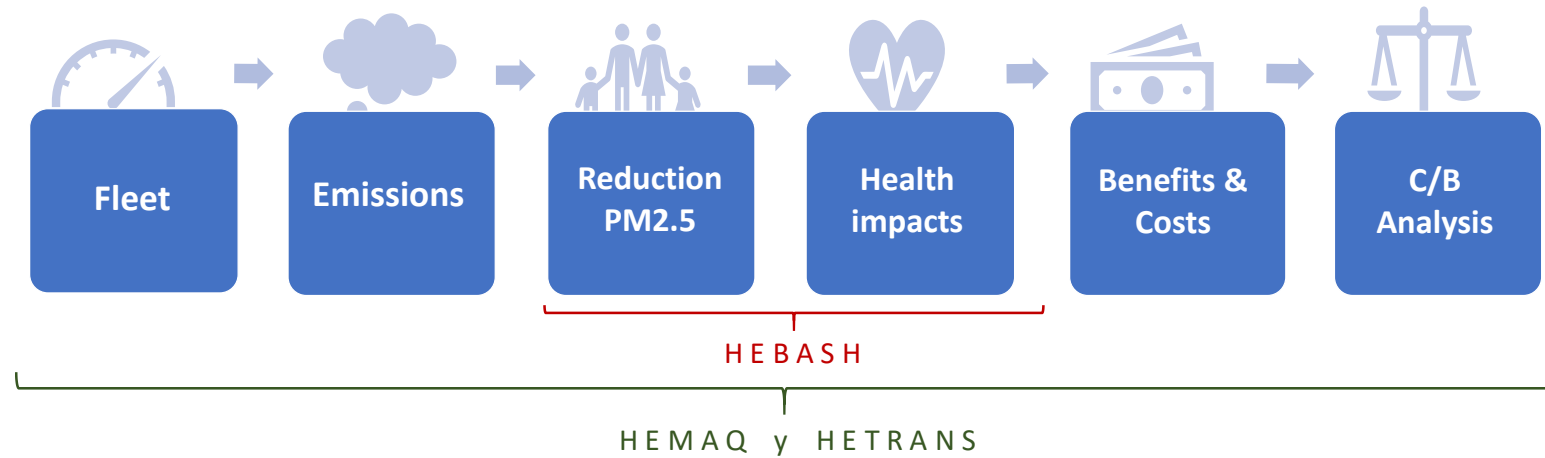
## Outcome 3 – Regional and global cooperation

- Webinars on urban transport topics: use of DPF on buses, flash charging for electric buses, among others.
- Regional events on emissions control in construction machinery, electromobility.
- AIRQ+ course: quantification of health effects due to exposure to air pollution, in coordination with WHO/PAHO.
- Latin American conference on nanoparticle emissions (Mexico City) – regional technical working group.
- Website <https://www.programacalac.com/> (Spanish/English).





# Tools for Cost-Benefit Analysis in Policies



## HEBASH

Environmental and Human Health  
Benefit Calculator for Air Quality  
Improvements



## HETRANS

Cost-Benefit of Euro 6/VI,  
electromobility, vehicle labelling

## HEMAQ

Cost-Benefit of regulatory scenarios  
for machinery



# Cost-benefit studies (environment/health)

## Chile

- Electromobility, Euro VI Standard, NRMM (Tier 4)

## Peru

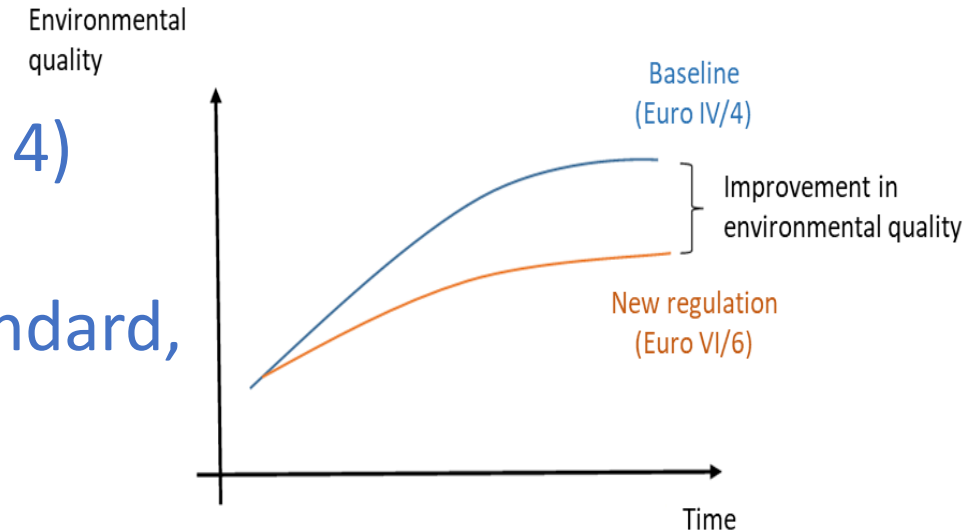
- Electric vehicles at a national level, Euro VI Standard, NRMM (Stage IIIB)

## Colombia

- Euro VI Standard, Electromobility, Vehicle labelling, NRMM (Stage IIIB)

## Mexico

- Renewal of RTP units and concessionary transport, Standard for new construction machinery incorporating particle filters.





# Working Group – NPTI Latin America

- Regional working group to promote the incorporation of standard to regulate the number of particles emitted by internal combustion engines.
- Open group, more than 90 member.
- Technical documents to include measurement test for particle number as part of technical inspection system for vehicles with particle filters.
- Capacity building based on the European experience (VERT), transfer of experiences in nanoparticle measurements in the Region.

**WORKING GROUP NPTI AMERICA LATINA**  
Grupo de Trabajo Regional dedicado a la elaboración de una propuesta de Normas con respecto al número de partículas emitidas por los motores de combustión interna

Clima y Aire Limpio en Ciudades de América Latina – Plus (CALAC+)

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CALAC  
Programa Clima y Aire Limpio en Ciudades de América Latina

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- Technical guide for the Periodic Technical Inspection (PTI) of vehicles fitted with DPF based on particulate counting
- Technical guide of instruments to measure particle number in exhaust gas - Part 1: Metrological and technical requirements
- Technical guide of instruments to measure particle number in exhaust gas - Part 2: Metrological Controls and Performance Tests
- 07 methodological guides for NRMM





# What do we expect for the second phase?

## Component 01 – Cleaner urban transport

Ultrafine Particle emissions, air pollutants and greenhouse gases from public transport system are reduced in a meaningful and sustainable way.

- Colombia and Chile: Strengthen the control and monitoring of nanoparticle emissions in Euro VI technology operating in capital cities, and the technical conditions for the operation of electric technology.
- Mexico: Promote the introduction of Euro VI technology in Mexico City, improving the current proposal to use Euro V with DPF, as well as increasing the number of trolleybuses and the introduction of electric buses.
- Peru: Promote the renewal of the fleet and the introduction of cleaner bus technology (Euro VI, natural gas, electric) in Lima's public transport system.





# What do we expect in the second phase?

## Component 02 – Incubator of NRMM public policies

Transfer capacities and experiences to strengthen the development of standards in countries to incorporate low emission construction machinery in urban areas.

- Colombia: Promote the implementation of the emission standard to introduce cleaner technology.
- Chile: Strengthen the control and monitoring of emissions in machinery with DPFs operating in the Metropolitan Region.
- Mexico: Promote the introduction of a decontamination measure for NRMM in cities, as well as the formulation of a national standard..
- Peru: Promote the generation of emission standards for NRMM entering the country.



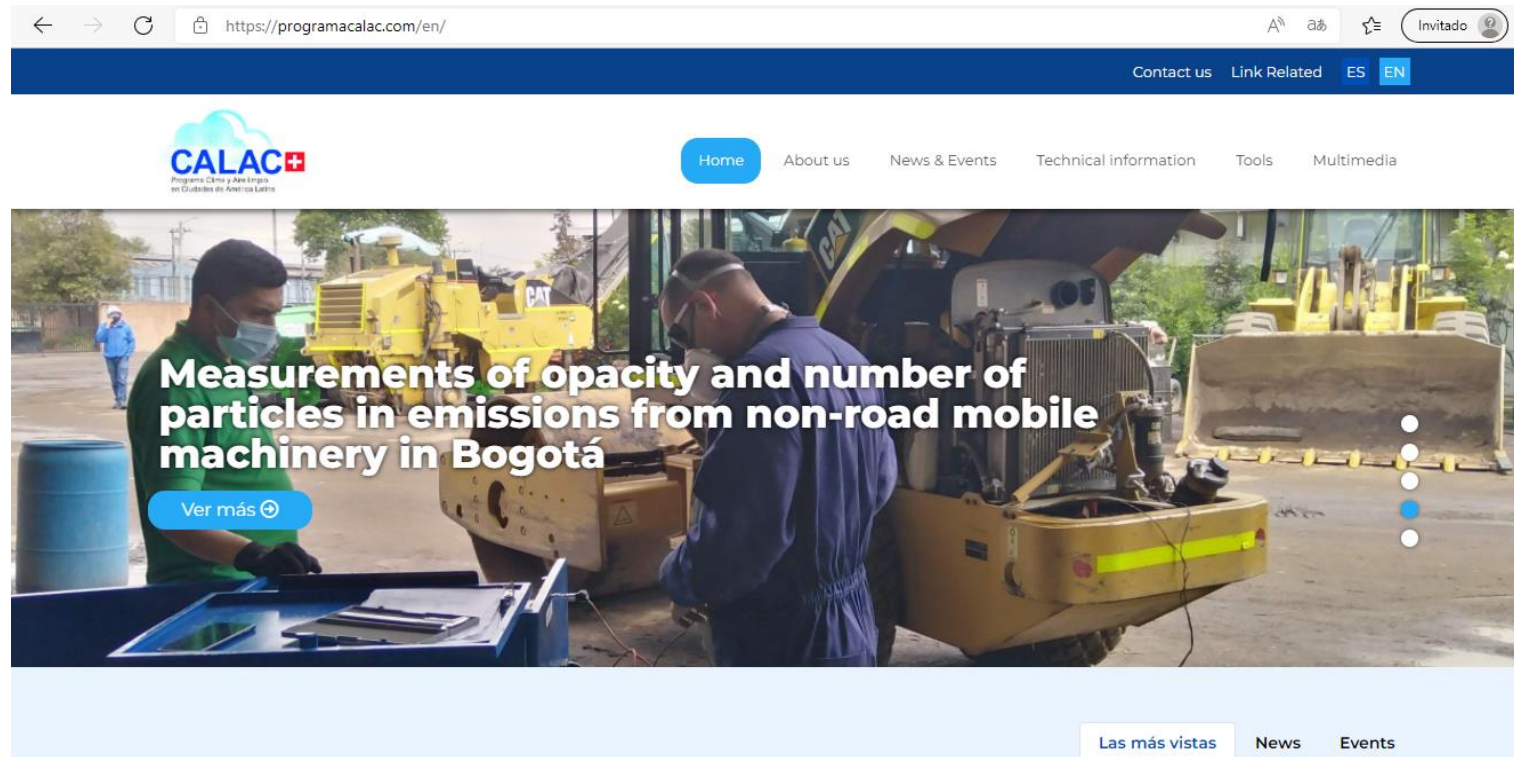


# What do we expect in the second phase?76

## Component 3 – Regional and global cooperation

Policies, actions, and efficient and validated technologies efficient are systematized and shared for regional and global scaling up.

- Nanoparticles technical committee
- Regional / global events
- Peer meetings





## 2nd Latin American Conference on Nanoparticle Emissions

**Registration:**  
<https://bit.ly/3BWUi8h>

November 25, 26 – 2021

8 a.m. 9 a.m. 10 a.m. 11 a.m.

- Health impacts.
- Emission reduction mechanisms.
- Vehicle measurement and technical inspections.
- Guidelines and new vehicle technologies.



Calac+ es un programa de:



Schweizerische Eidgenossenschaft  
Confédération suisse  
Confederazione Svizzera  
Confederaziun svizra

Agencia Suiza para el Desarrollo  
y la Cooperación COSUDE

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# Module 1 – Advances and global decisions on ultrafine particulate matter

- New global guidelines on air quality and recommendations on ultrafine particulate
- Importance of both size and composition of ultrafine particles in Europe
- Advances in the U.S. and vision's changes from the new public administration, giving importance to the particles
- Ministry of Environment and Sustainable Development of Colombia and Secretariat of Environment of Mexico City presented proposals and advances to fight pollution and how to face the entry of new technology





## Module 2 – Experiences in the measurement of particle number

- Measurement of particle number in Europe
- Measurement in Latin America: Mexico for heavy vehicles, Chile for light and heavy vehicles, and Colombia, measurements on TransMilenio fleet (buses).
- Technological workshop with 5 manufacturers of measurement equipment with samples and technology virtual presentations.

*Challenge: having reliable and comparable information to search suitable technology are the key that will allow the adoption of public policies.*



### Particle number measurement in Europe 2<sup>nd</sup> Latin American Conference on Nanoparticle Emissions

November 26<sup>th</sup>, 2021

#### FILTROS DE PARTÍCULAS DIÉSEL EN LA CIUDAD DE MÉXICO

2<sup>nd</sup> Latin American Conference on Nanoparticle Emissions

Measurement campaigns of particle number in  
heavy duty and light duty vehicles in Chile

Campañas de medición del número de partículas  
en vehículos pesados y vehículos livianos en  
Chile

Robert Fraser  
Purexhaust SA  
26 Nov 2021

#### MEDICIÓN DEL NÚMERO DE PARTÍCULAS EN BUSES DE LA FLOTA DE TRANSMILENIO (BOGOTÁ)



Contrato No. 021-2021

26/Nov/2021



**Thank you very much for your attention!**



Visit:

<https://programacalac.com/>