Transport emissions in Chile, current situation and looking ahead for a carbon-neutral future?

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Three studies: recent past, present and future

- Exhaust emissions for on-road transportation in Chile, 1990-2020
- Local emission factors using Portable Emission Measurement Systems
- Forecast analysis evaluating carbon neutrality goals by 2050

High-definition spatial distribution maps of on-road transport exhaust emissions in Chile, 1990 - 2020.

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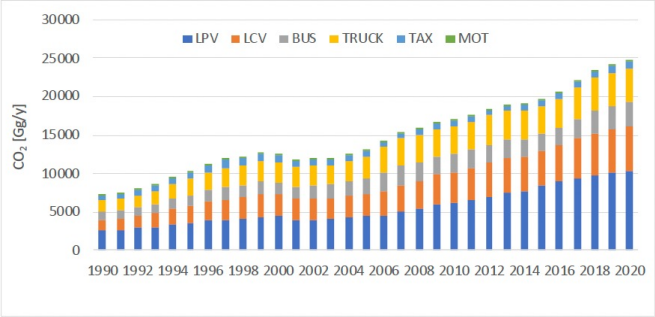
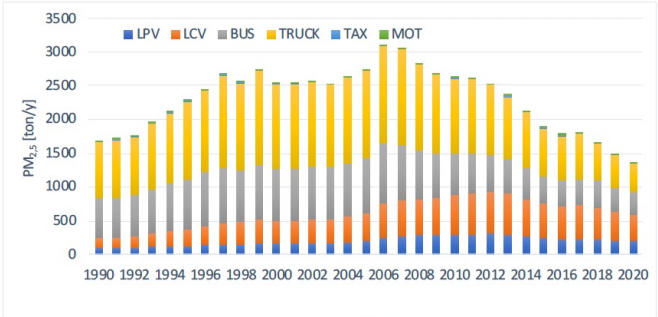
On-road transportation, Chile, 1990-2020

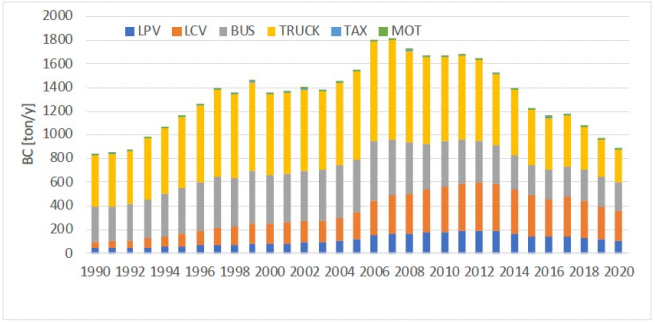
Emissions are provided at high-spatial resolution (0.01º x 0.01º) over continental Chile from 18.5 S to 53.2 S, including local pollutants (CO, VOC, NOx, MP2.5), black carbon (BC) and greenhouse gases (CO2, CH4).
The methodology considers 70 vehicle types, based on ten vehicle categories, subdivided into two fuel types and 20 seven emission standards.



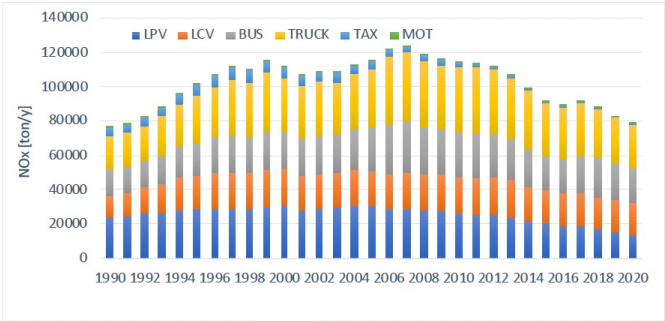
(a) CO_2



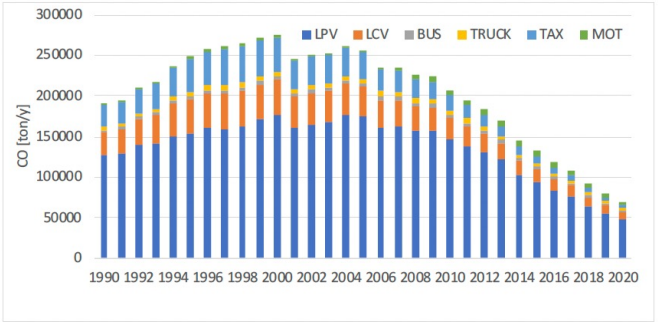
(b) $PM_{2.5}$



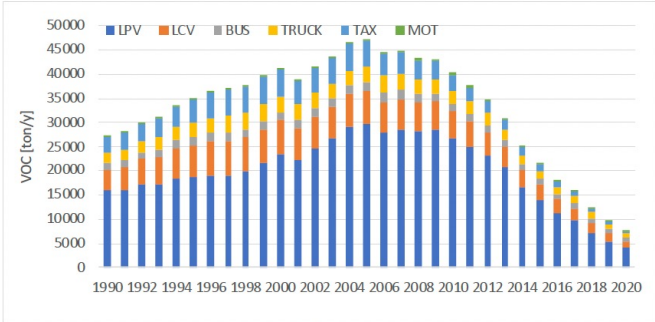
(c) BC



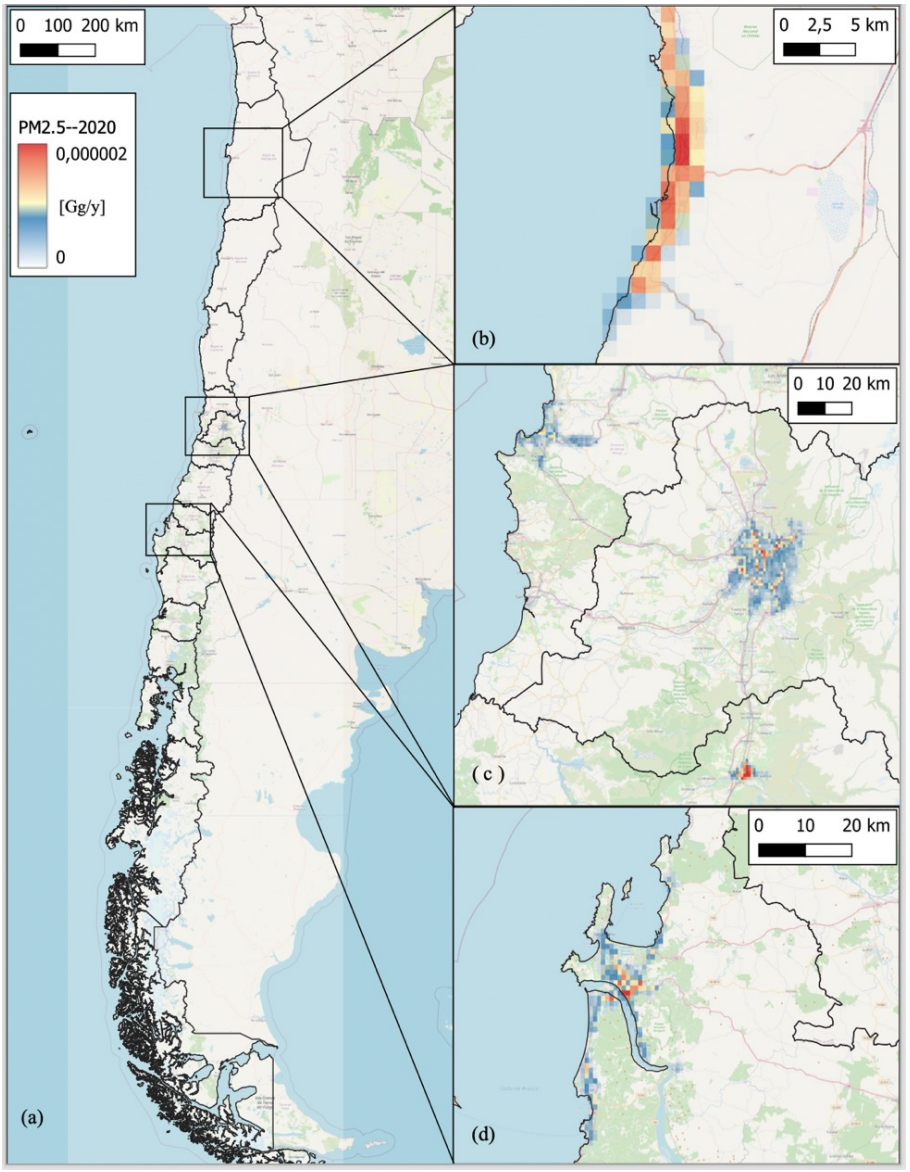
(d) NOx



(e) CO

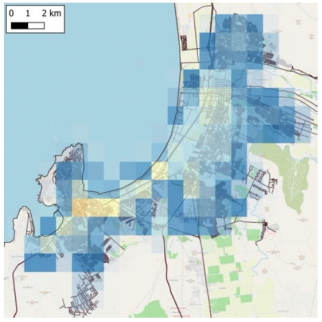


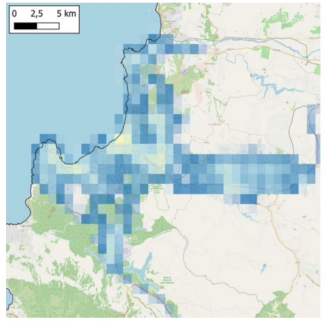
(f) VOC

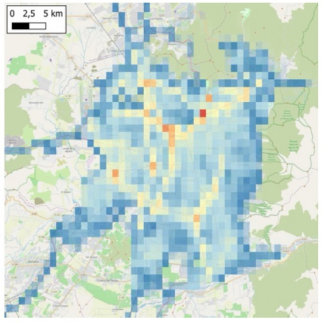


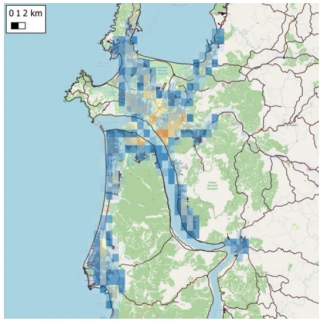
On-road transportation, Chile, 1990-2020

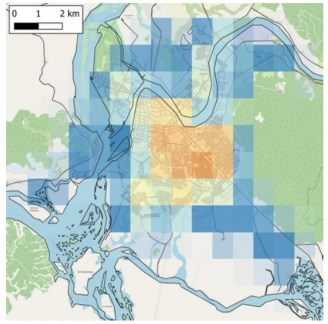
- Bottom-up, high-resolution national inventory of exhaust emissions for

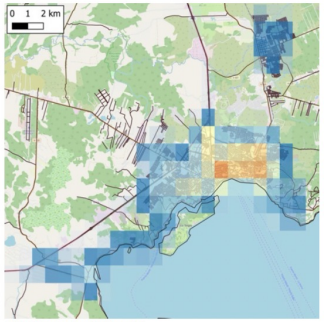

(a) La Serena


(b) Valparaíso

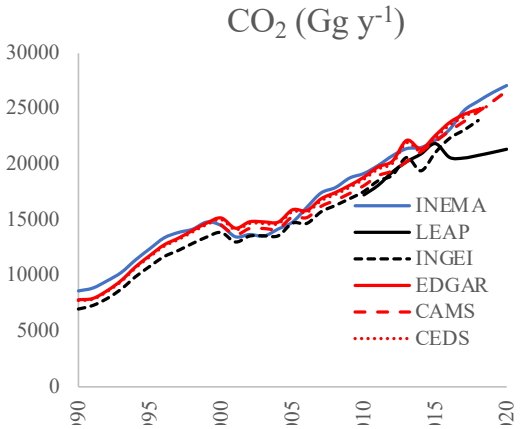

(c) Santiago

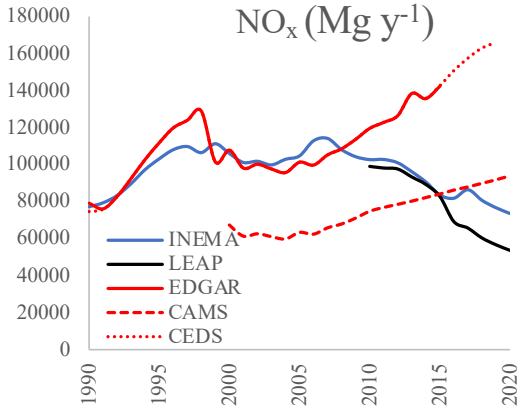

(d) Concepción

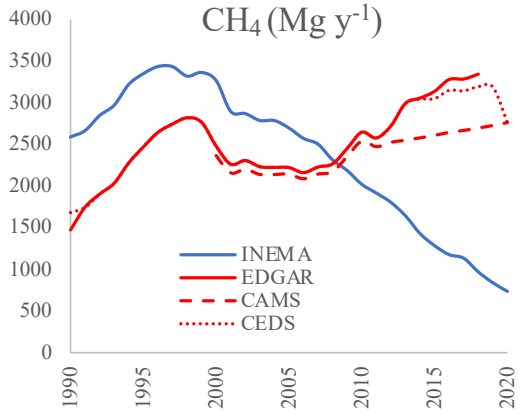

(e) Valdivia

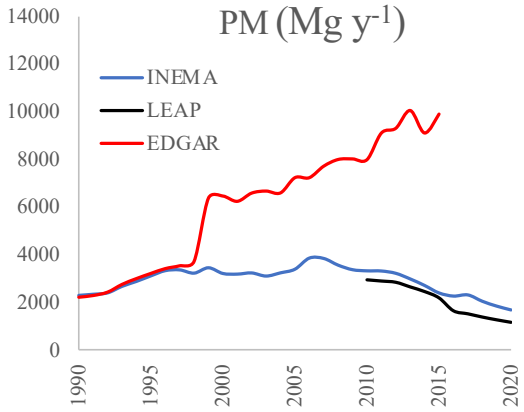

(f) Puerto Montt

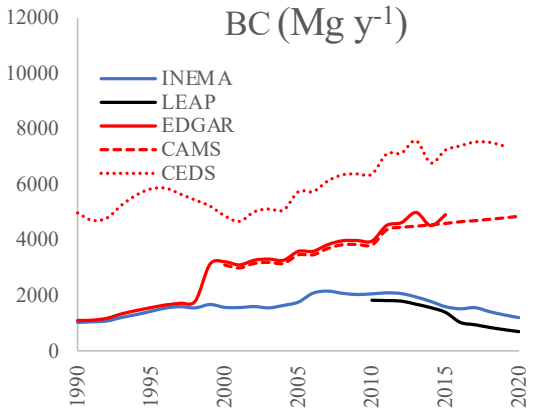
On-road transportation, Chile, 1990-2020

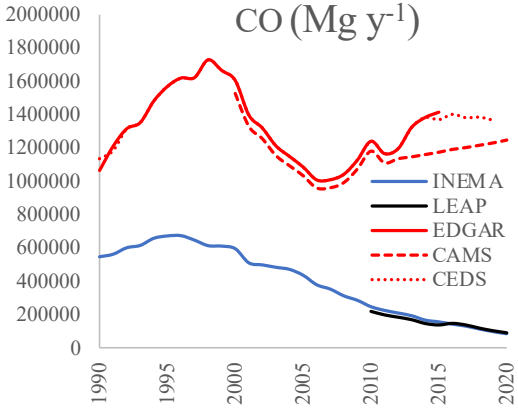












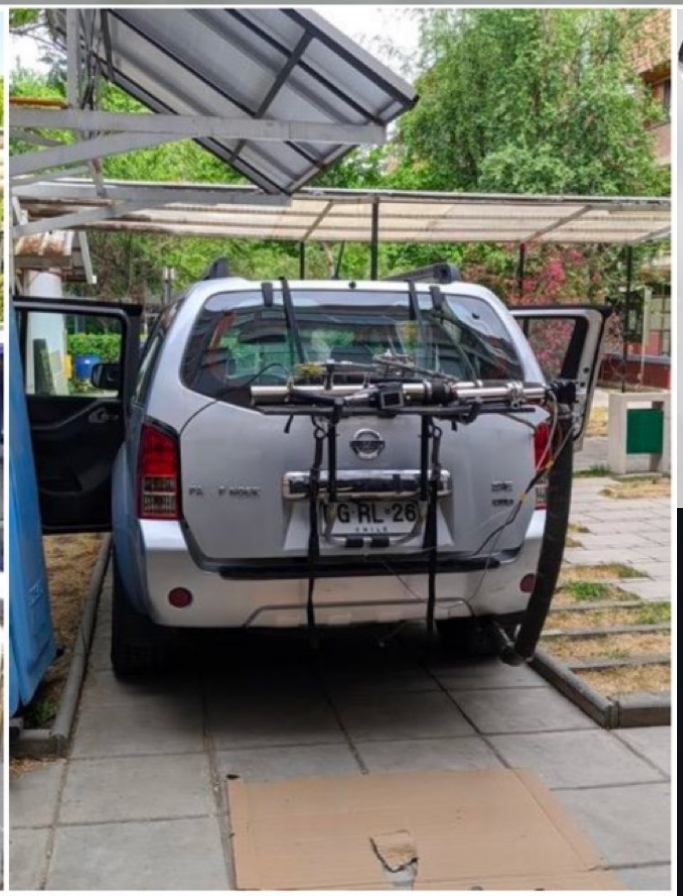
Dieselgate in Chile?
Measurement of local emission factors, using portable emission measurement systems (PEMS)

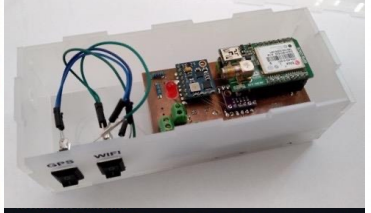
Laboratory testing and real driving emissions

PEMS: Portable Emissions Measurement System

3er Seminario: ACTIVIDAD VEHICULAR, CALIDAD DEL AIRE, Y CAMBIO CLIMÁTICO

PROYECTO FONDEF ID18|10297





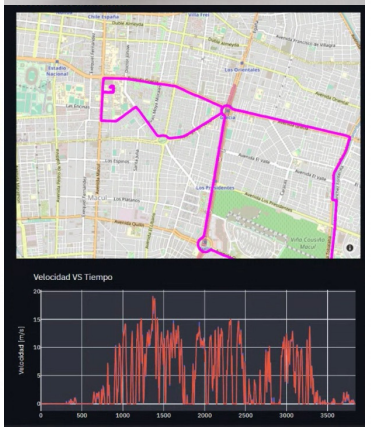


Figura 9. Montaje de analizadores en vehículo gasolina (izquierda) y diésel (derecha)

INVITAN UTEM

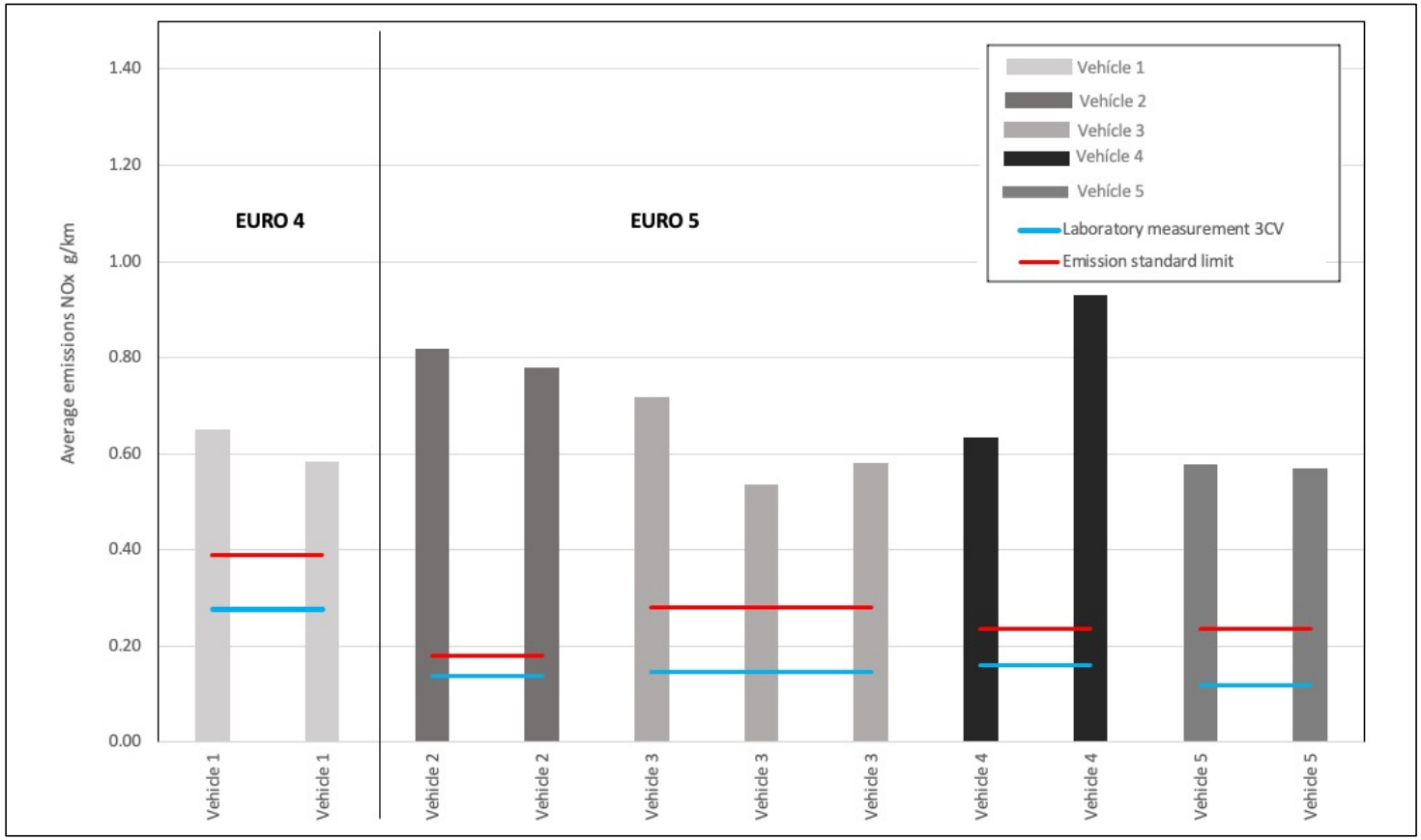
COLABORAN UC RIVERSIDE Center for Environmental Research and Technology DHE MAX tssrc

PATROCINAN FONDEF Fondo de Fomento al Desarrollo Científico y Tecnológico

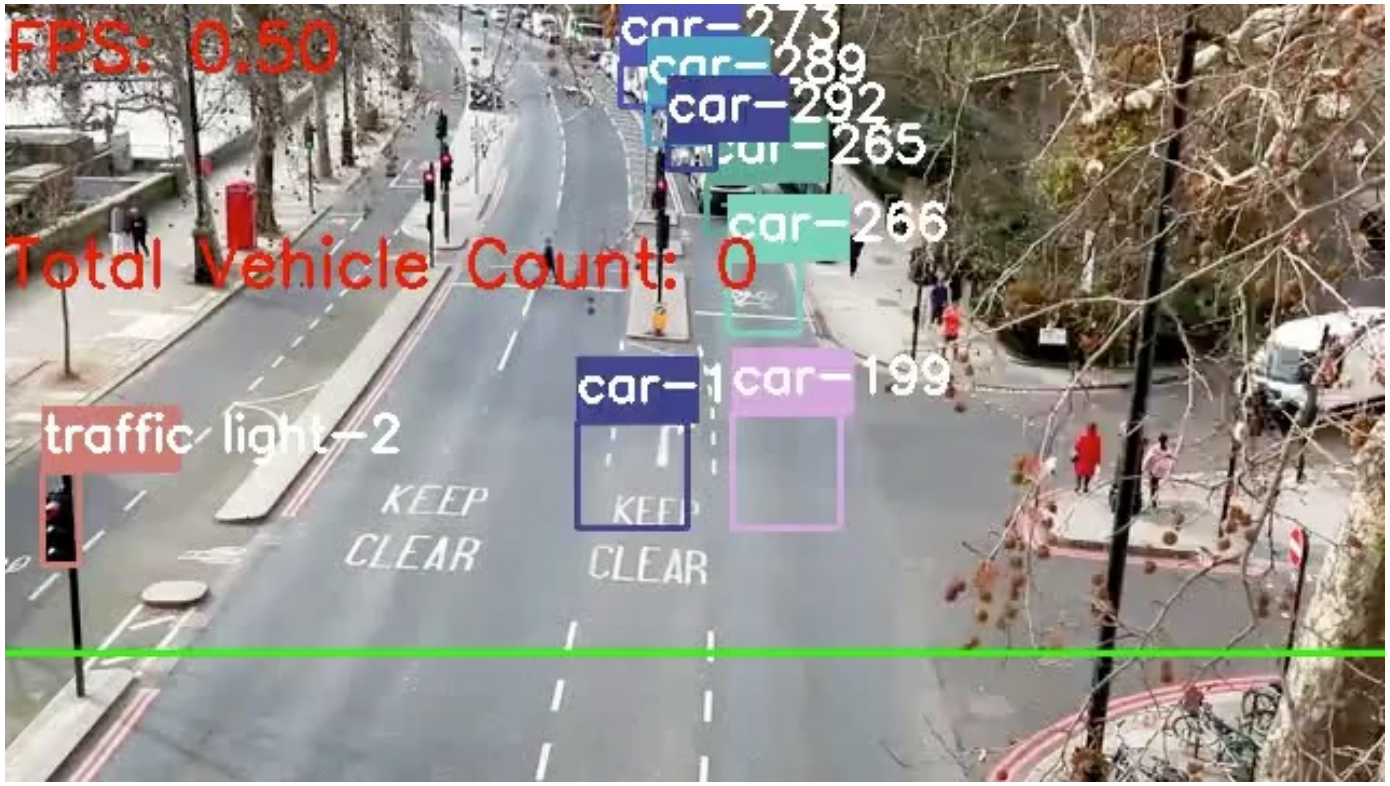
PRODUCE SNC SOMOS NEW CITY

Emissions results in Chile

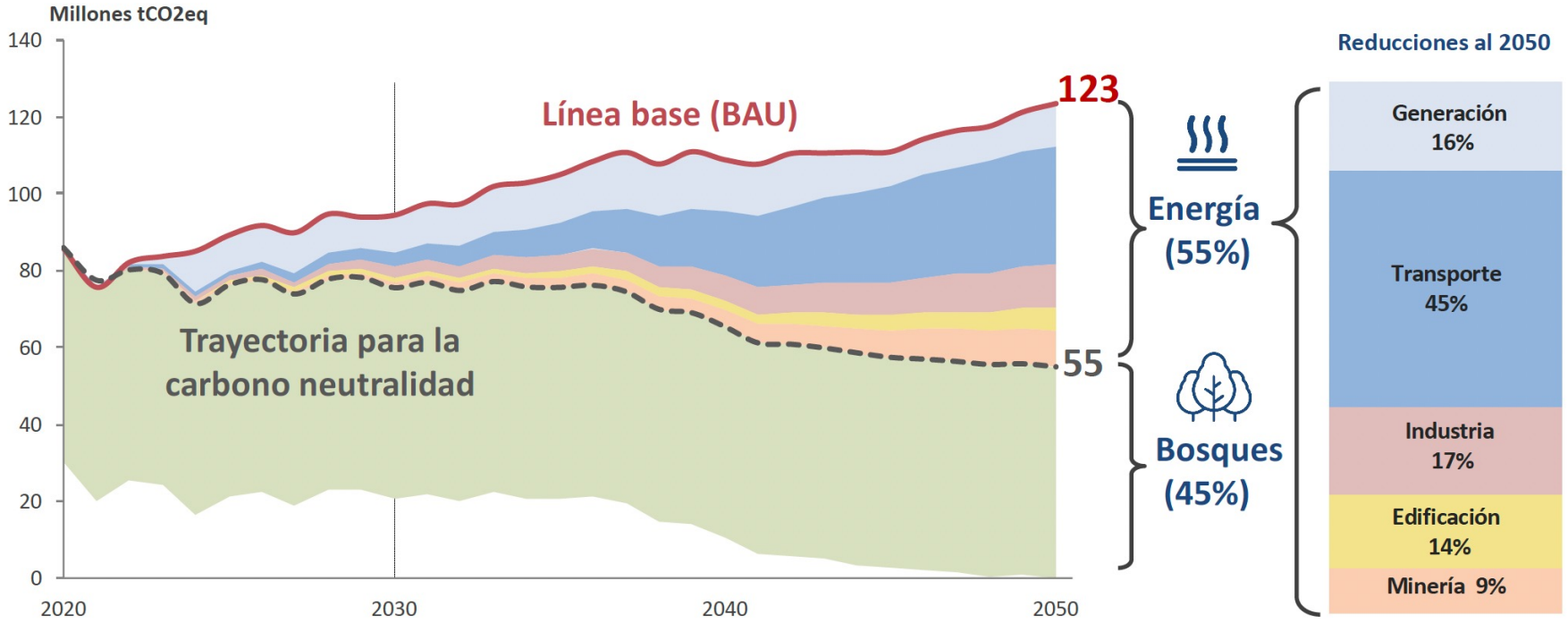
PEMS real driving emissions from 5 cars were compared with emission's standard limits (blue lines) and laboratory measurements at 3CV (*red lines)*.



Real-time vehicle counts with specialized algorithms and low-cost equipment

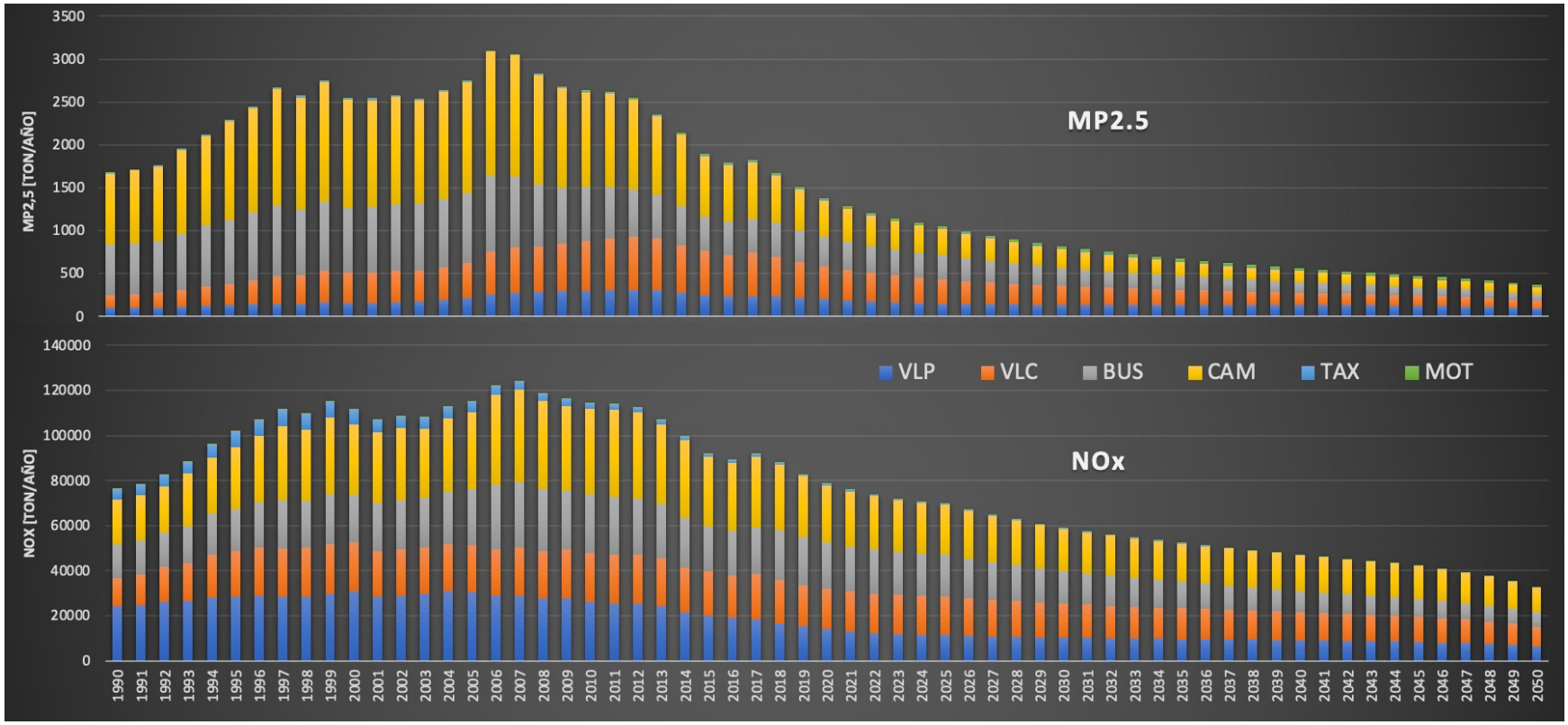


Forecast for carbon neutrality by 2050



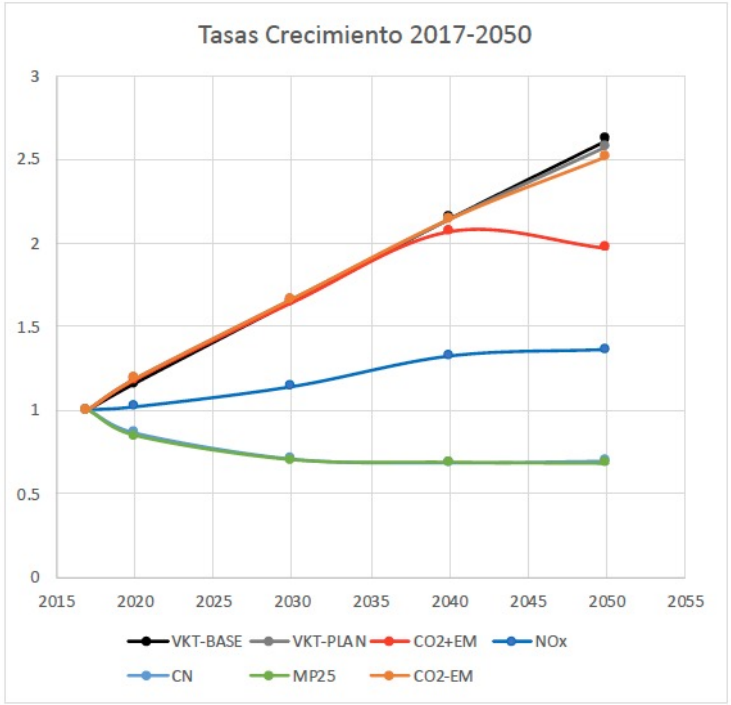
Forecast for carbon neutrality by 2050

- Forecast analysis for the years 2020-2050, considering various official strategies for all modes of transport in Chile.



Forecast for carbon neutrality by 2050

- Evaluating the feasibility of achieving carbon neutrality by 2050, while reducing emissions of criteria pollutants in urban areas.



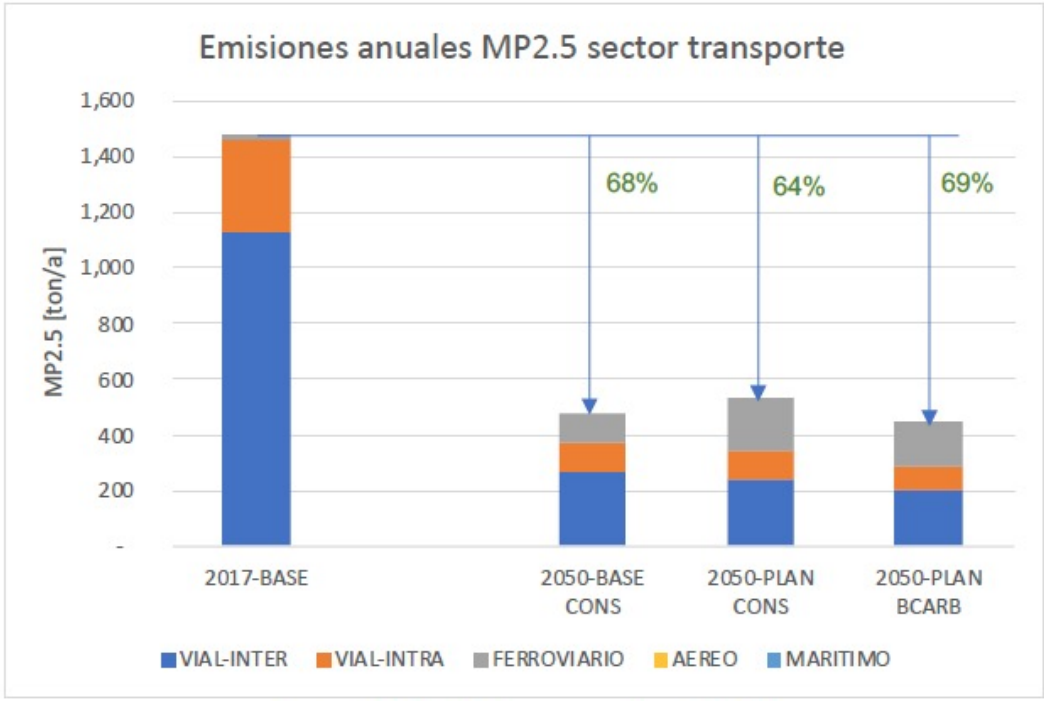


Figura 25: Emisiones anuales MP2.5

Conclusions

- This presentation illustrates the potential of local datasets for policy ex-post impact assessment.
- It also reinforced the value of available official raw data, produced with transparent methods and on a regular basis, as well as the production of national inventories.
- Work should be done on the construction of local emission factors, real emissions campaigns of a sample of the fleet could strengthen the results of this analysis.
- These datasets and methodology contribute to produce projections and scenarios for future policy making.