

Air Quality Co-benefits from Decarbonization

Sneak preview of findings from recent research in Costa Rica

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Why decarbonization in Costa Rica?

- National pride
 - Democracy
 - No army
 - Keylor Navas
 - Carbon neutrality=pura vida
- Leading country, UN Champion of the World
- Available technical assistance and international cooperation
- Economic reasons ➤ co-benefits

Economic Valuation of
Health Benefits
Associated with the
Reduction of Air
Pollution

Greater Metro Area of
San José
2017



Interesting things and results

Interesting things

- Relationship between air quality and health is an urban problem
- Impact of pollution in health depends on concentration but also on composition and time of exposure
- Inhalable coarse particles $2.5 < 10 \mu\text{m}$ in diameter
 - Availability of data
- Importance of local pollutants

Results of pollution reduction in Great Metro Area to $20 \mu\text{g}/\text{m}^3$ of PM_{10}

- Reduction in deaths: 3.45% of all deaths
- Asthma crises down in 3.27%
- Chronic bronchitis avoided in 8.52%
- Acute bronchitis in children avoided in 27.4%
- Hospital admissions down
 - 1% respiratory illnesses
 - 0.5% cardiovascular illnesses

Costa Rica: Analytical work for emissions levy

In addition to achieving reductions in CO₂, levy will decrease emissions of local air pollutants including

- fine particulate matter (PM)
- sulfur dioxide (SO₂)
- nitrogen oxides (NO_x)
- Considers benefits of avoided emissions and use of revenues

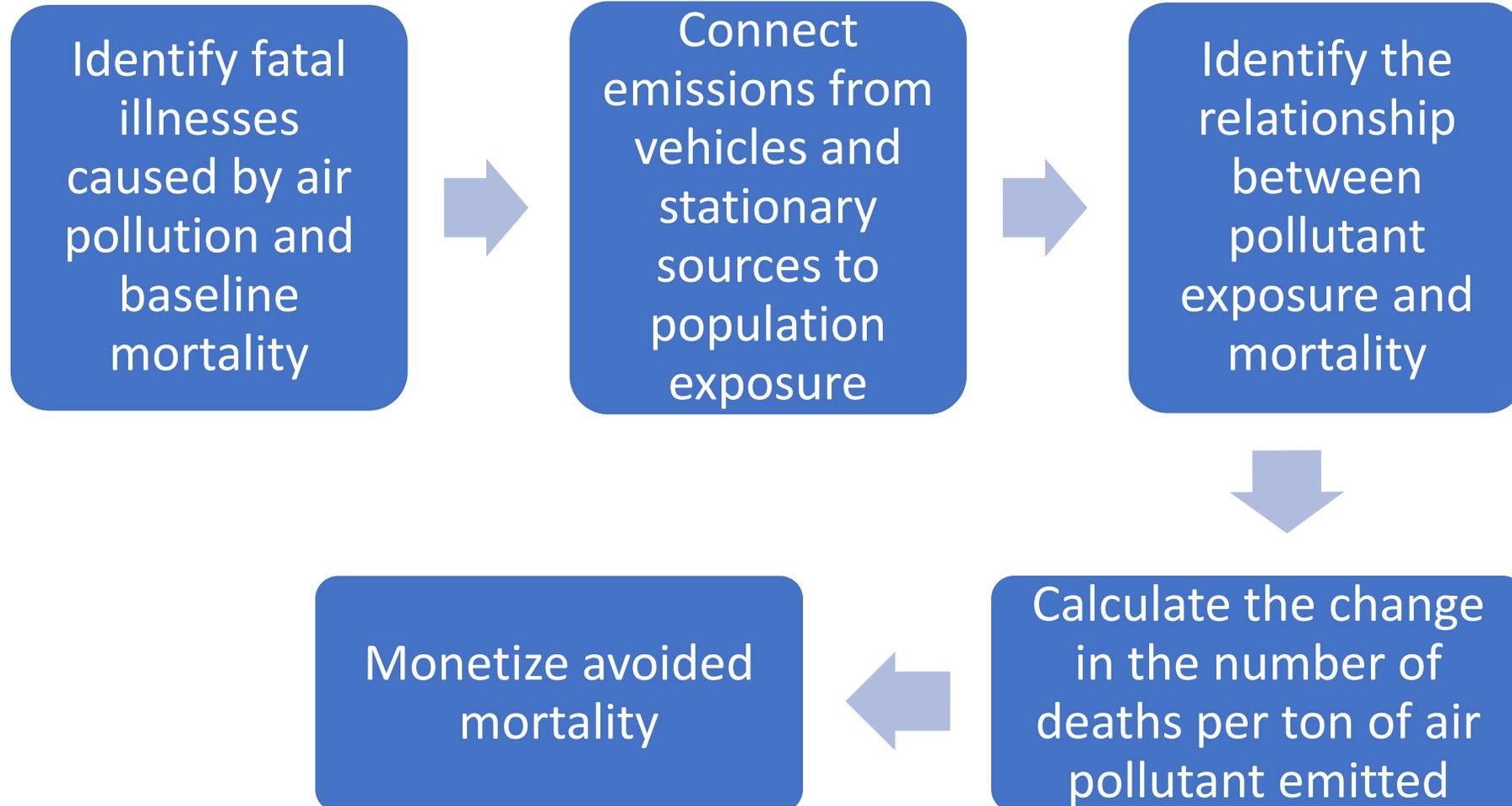


CLIMATE FOCUS

Emissions Levy for Costa Rica: Technical Design and Analysis of Impacts

Tasks 2, 3 and 5 of PO# 7184374 – PMR Costa Rica: Assessment and design of a GHG emissions levy for mobile and stationary sources

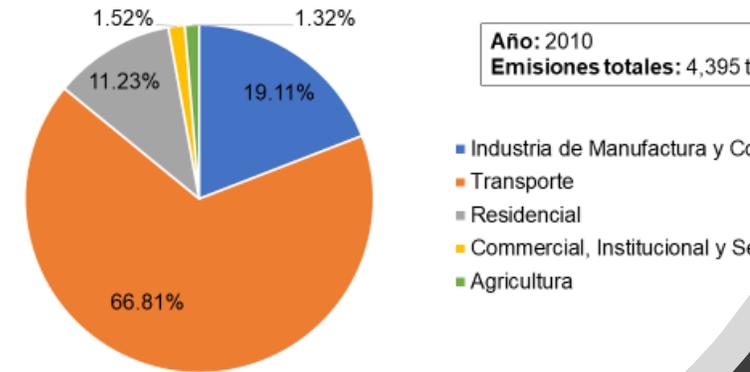
Measuring Health Benefits of Pollutant Emission Reduction: Methodology



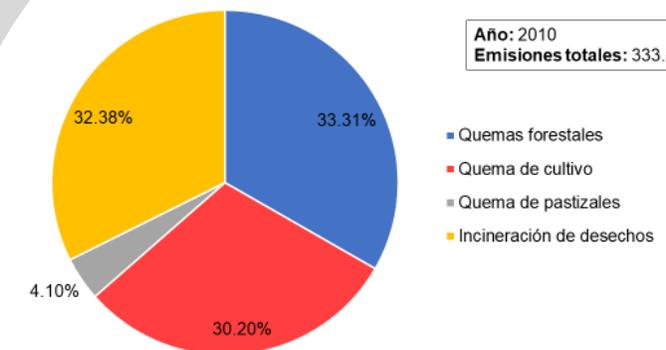
Black carbon in Costa Rica

- Recent research
- >90% of black carbon emissions in Costa Rica are related to energy consumption.
- More than 2/3 of black carbon emissions from the energy sector are related to transport.
- Around 4730 tons of black carbon were emitted in Costa Rica in 2010.
- Black carbon emissions are expected to be reported in all upcoming National GHG Inventories.

Fuentes principales de emisiones de carbono negro



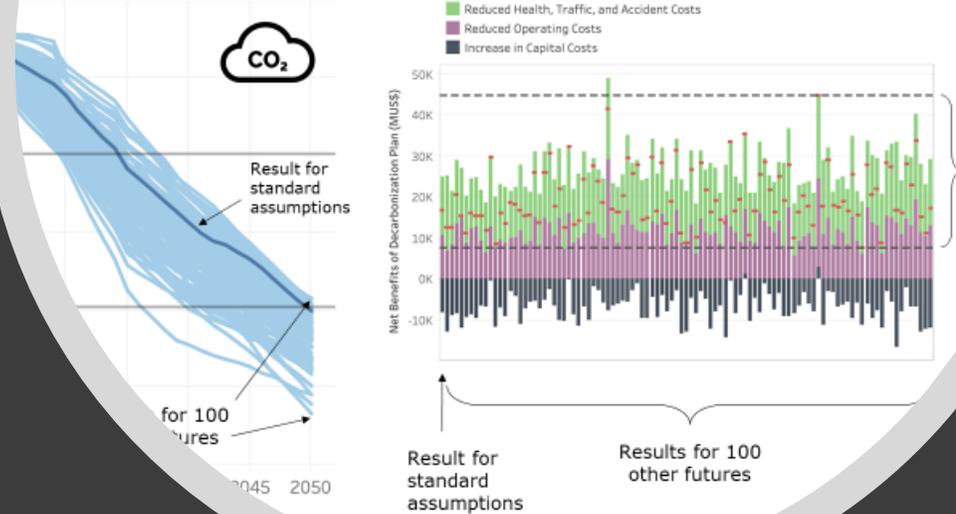
Fuentes principales de emisiones de carbono negro



Co-benefits of Decarbonizing Transport

- Analysis of the cost-benefit of 3 transport axes (public, private, freight) of the Decarbonization plan in 100 potential future scenarios.
- Net cost-benefit always positive, with large variations in magnitude.
- Under standard assumptions (\$19.5 billion to 2050)
 - Direct system-cost saving: \$5.9 billion
 - Health benefits from clean air: \$0.72 billion
 - Cost reduction from reduced accidents: \$9 billion
 - Cost reduction from decreased congestion: \$4.6 billion

g the Decarbonization Plan under uncertainty show
 tly strong emissions declines and positive net bene



health, traffic, and accident
 net benefits to Costa Rica



Under standard assumptions
 Decarbonization Plan pro
 almost **\$19.5 billion** of
 benefits to Costa Rica fr
 2020-2050

Reflections

- Why a levy and not a tax?
- Co-benefits weigh in on social security (universal health care in Costa Rica)
- Fiscal rebalancing vs alignment
- Use of revenues: carbon entanglement?
- Common sense for communications purposes
 - Co-benefits of carbon pricing make sense for policy makers and society in general

Thank you!