

SEMANA del CLIMA 2021 en Latinoamérica y el Caribe



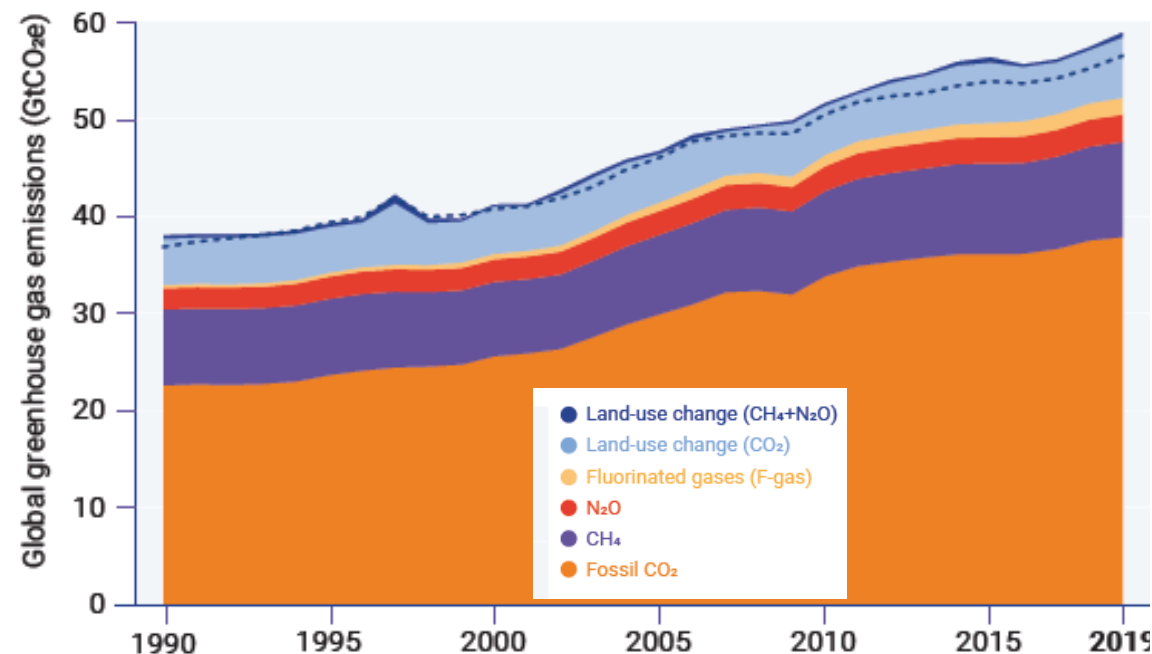
Graciela B. Raga
Centro de Ciencias de la Atmosfera
Universidad Nacional Autónoma de México
raga.graciela@gmail.com ; raga@unam.mx



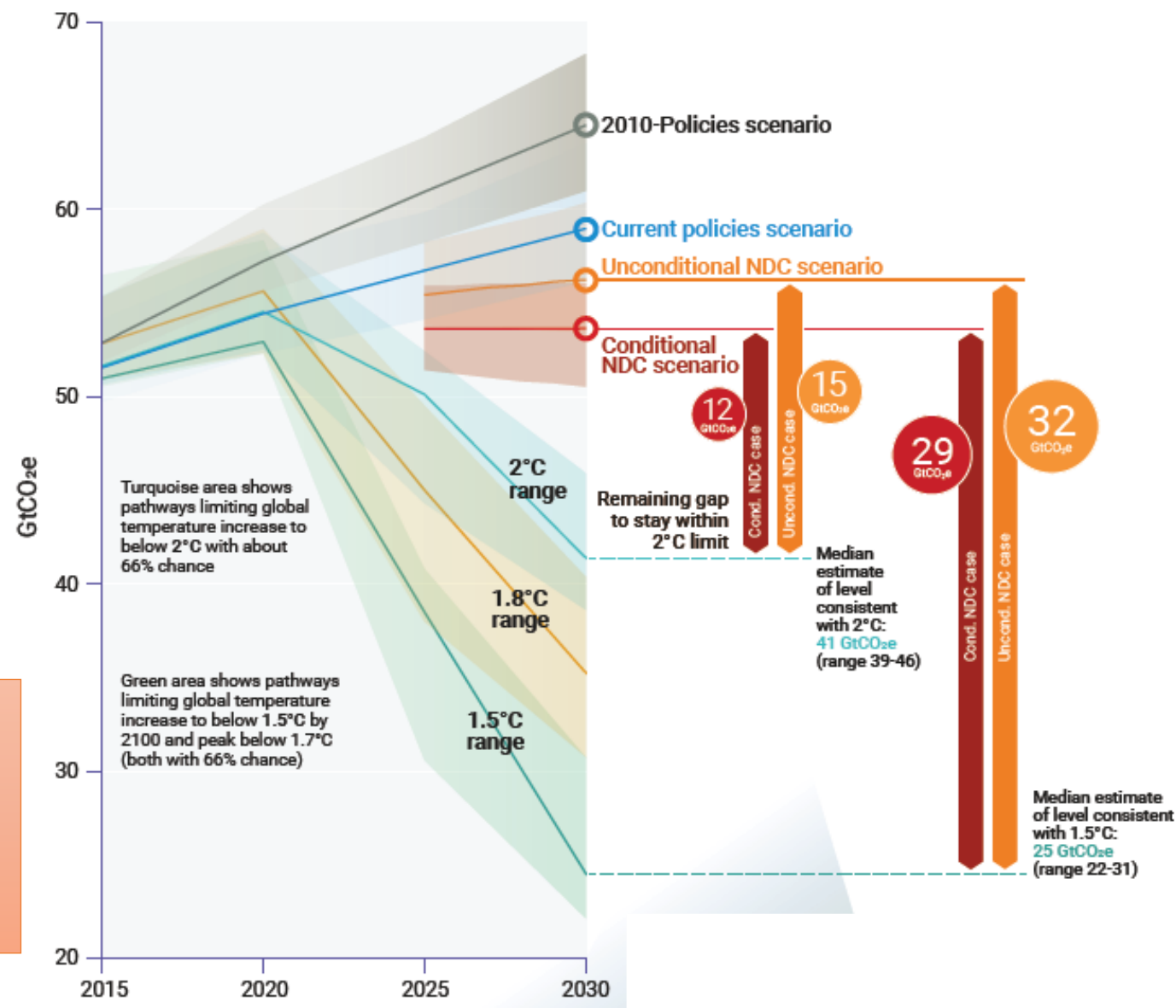
Miembro del Comité Científico Asesor de la *Coalición de
Clima y Aire Limpio*



REPORTE: "EMISSIONS GAP" (UNEP, 2020)



Contaminantes climáticos de vida corta (CCVC): **metano y carbono negro** contribuyen a la contaminación del aire, impactos en salud y calentamiento global

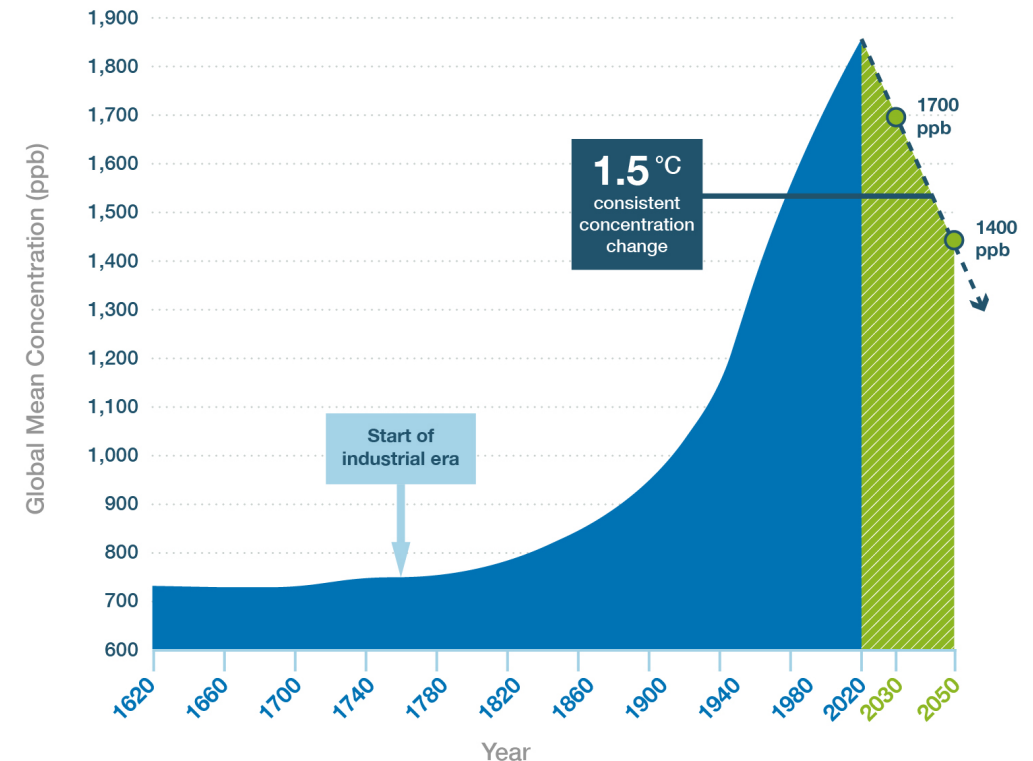


GLOBAL METHANE ASSESSMENT (released 6 May 2021)

The atmospheric concentration of methane is increasing faster now than at any time in the observational record.

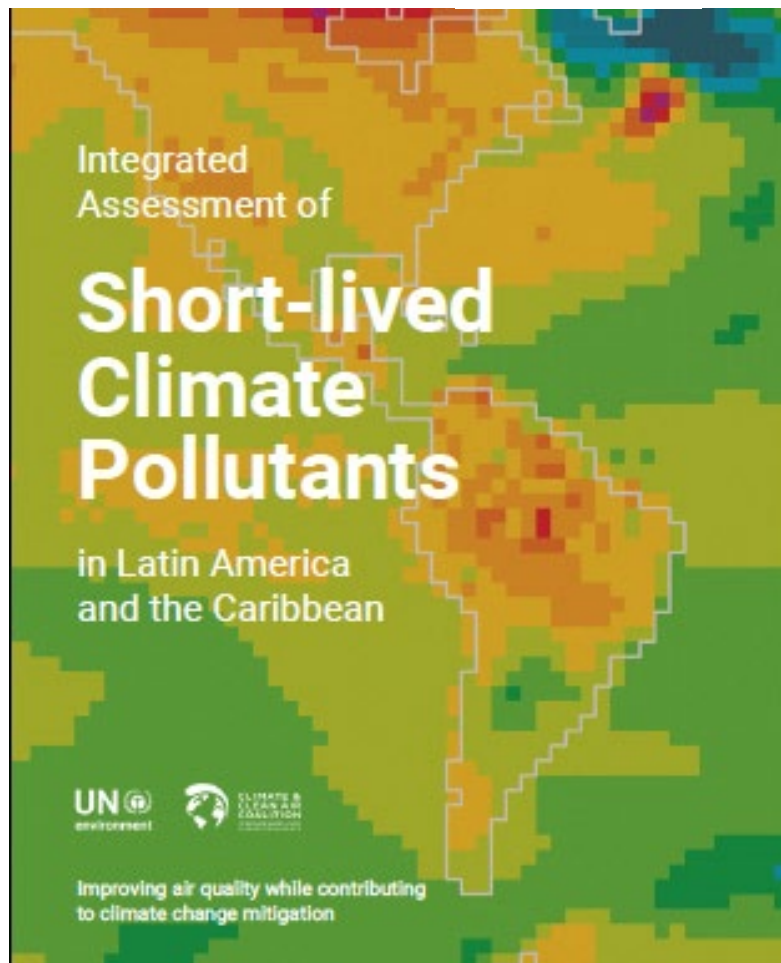
- Likely in part due to fossil fuels - surge in gas extraction
- Likely in part due to tropical biogenic flux (perhaps climate driven)
- Regardless of exact fraction of total or growth from specific sectors, we know the big ones and can reduce them!

Global average methane concentrations



Source: Ed Dlugokencky, NOAA/ESRL

CCAC. All rights reserved



Evaluación Integral de Contaminantes Climáticos de Vida Corta en Latinoamérica y el Caribe

Co-Chairs: Graciela B. Raga, CCA-UNAM, Mexico, Paulo Artaxo, USP, Brazil

Con contribuciones de 97 autores

GAINS: Greenhouse gas–Air pollution Interactions and Synergies model from IIASA (Amann et al., 2011)

- *Linea de base: 2010*
- *Escenario de referencia al 2050*
- *Escenario de mitigación de CCVC al 2050*
- *Escenario solo de mitigación de CO₂ al 2050*

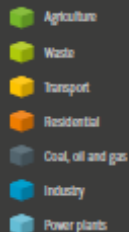
<http://www.ccacoalition.org/en/resources/integrated-assessment-short-lived-climate-pollutants-latin-america-and-caribbean>

FIGURE 1

Sectoral and regional contribution to CH₄ emissions in the LAC region in 2010.

NOTE

1 teragram (Tg) = 1 million tonnes

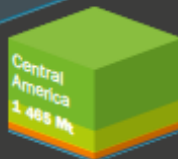
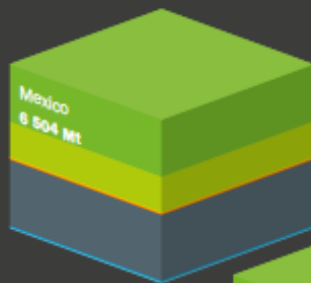


Methane

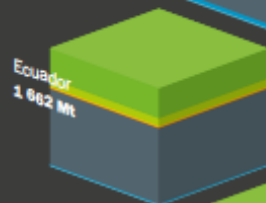
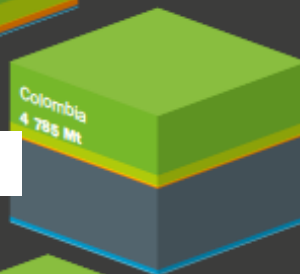
The LAC region emits about 54 teragrams (Tg)⁵ of CH₄ (baseline 2010) per year, accounting for approximately 15 per cent of total global CH₄ emissions, with just over half LAC's emissions originating in Brazil and Venezuela (Figure 1). Virtually all of these emissions in the region originate from three sectors: agriculture, approximately 50 per cent; coal, oil and gas production and distribution, approximately 40 per cent; and waste management, approximately 10 per cent. At the national level, the importance of specific sectors varies but, with exception of Venezuela, ag-

riculture is a major source, ranging from about 30 per cent of total CH₄ emissions in Ecuador to about 90 per cent in Paraguay. The oil and gas industry sector dominates emissions in Venezuela, accounting for nearly 90 per cent but is also important in Ecuador, contributing 60 per cent of total emissions, and in Mexico, 40 per cent; coal mining is a significant source in Colombia, contributing more than 50 per cent.

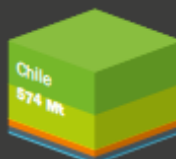
MEXICO



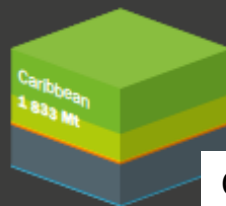
COLOMBIA



CHILE

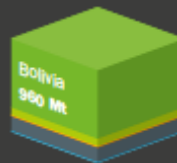
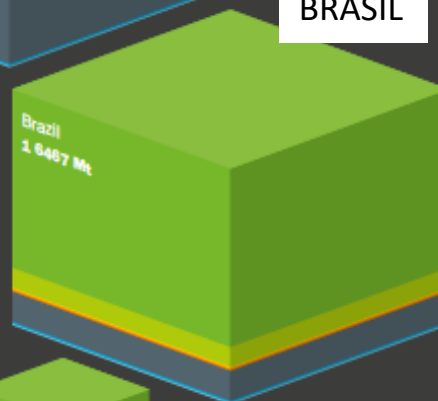
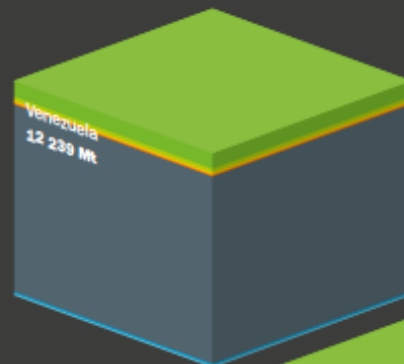


CARIBE

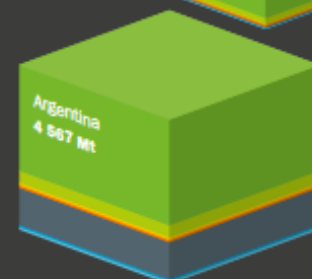


CH₄ Sector share in LAC (2010)

BRASIL



URUGUAY



2010

Agricultura

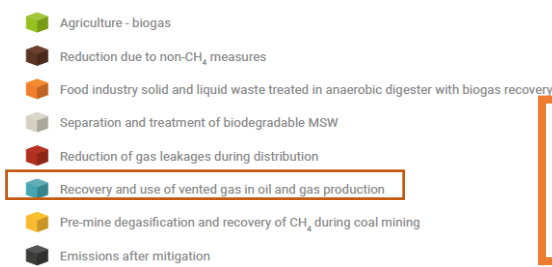
54 818 Kt (total)

Residuos

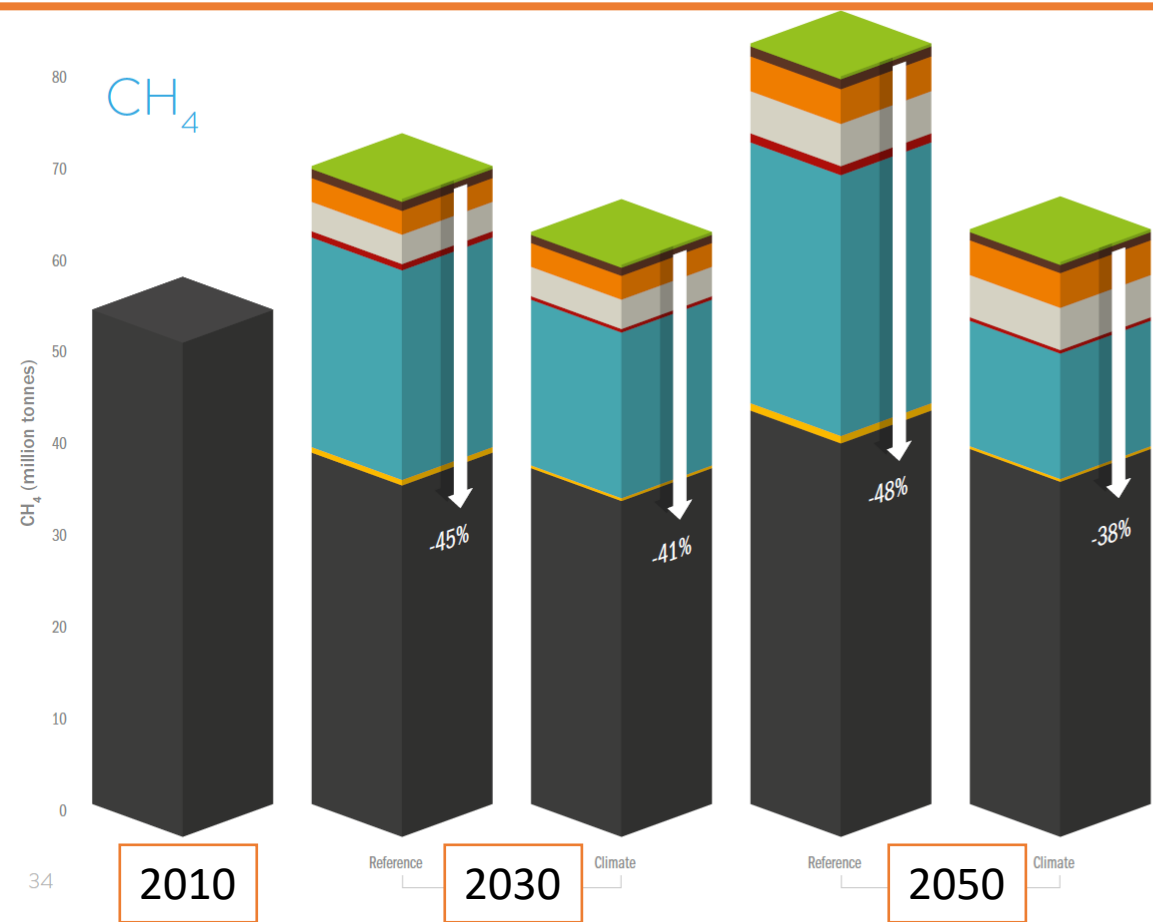
Combustibles fósiles

MEDIDAS DE MITIGACIÓN

Agricultura	1. Digestión anaeróbica con recuperación de biogas (a partir de excremento de ganado)
Tratamiento de residuos	2. Separación y tratamiento de residuos solidos biodegradables a nivel municipal 3. Residuos sólidos y líquidos de la industria alimenticia tratados en digestores anaeróbicos, con recuperación de biogas
Producción y distribución de gas y petróleo	4. Recuperación y uso del gas ventilado durante la producción de gas y petróleo 5. Reducción de fugas durante la distribución de gas
Minería de carbón	6. De-gasificación en las minas y recuperación durante proceso de extracción



Reducción de emisiones a 2030 y 2050 de la implementación completa del escenario de mitigación de CCVC comparado con escenario de referencia.



El mayor potencial de mitigación en LAC se asocia con la industria de gas y petróleo (turquesa)

México: recuperación de metano en la industria de gas y petróleo

Reducción de
METANO por país
y sector
implementando
medidas
identificadas

Methane Mitigation Measures

Oil & Gas

Waste

Mining

Agriculture

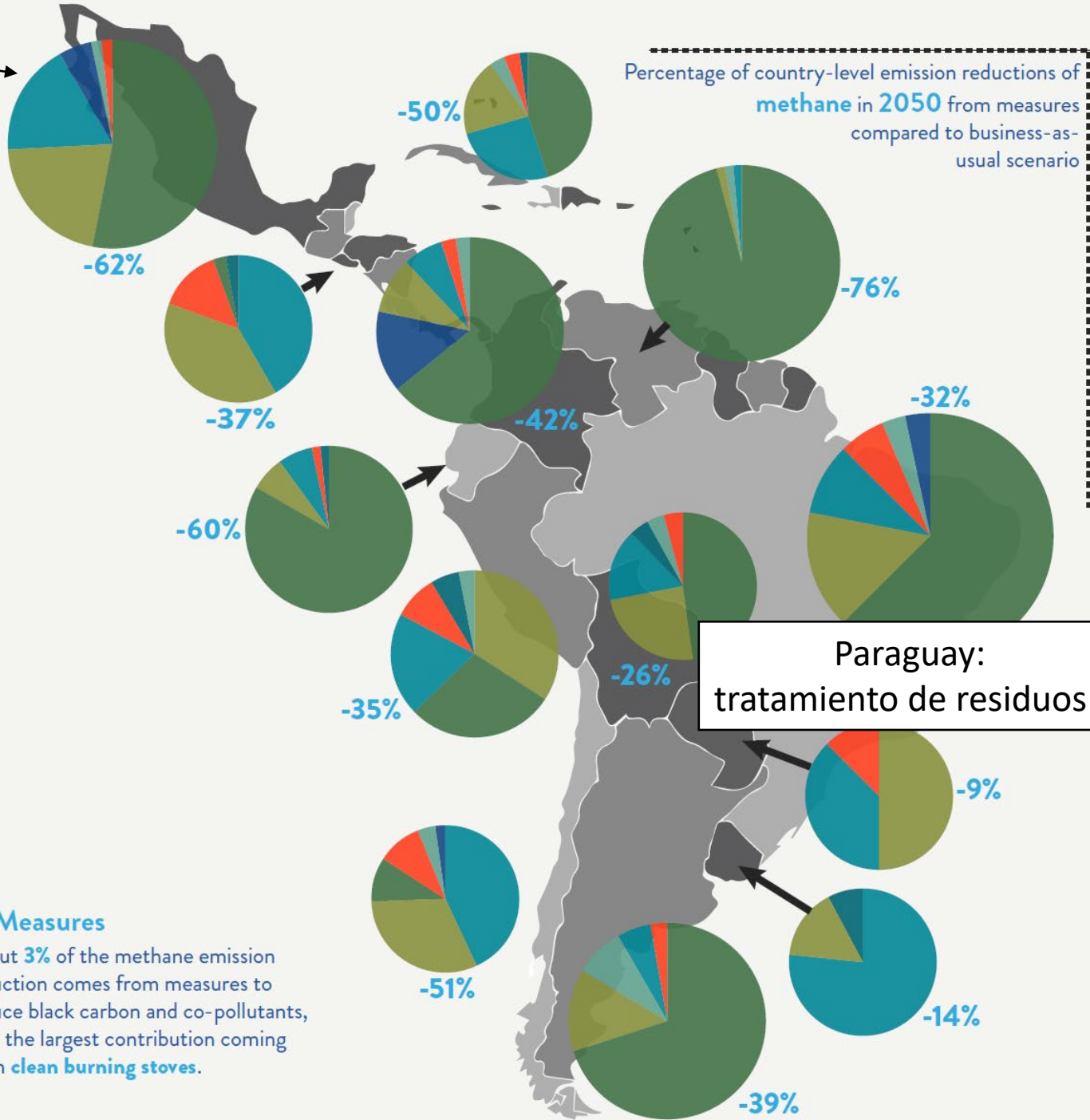


Black Carbon Measures



About **3%** of the methane emission reduction comes from measures to reduce black carbon and co-pollutants, with the largest contribution coming from **clean burning stoves**.

Percentage of country-level emission reductions of **methane** in **2050** from measures compared to business-as-usual scenario



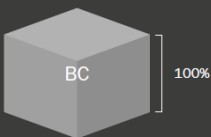
Paraguay:
tratamiento de residuos

FIGURE 2

Sectoral and regional contribution to BC emissions in the LAC region in 2010.

NOTE

1 gllagram (Gg) = 1 000 tonnes

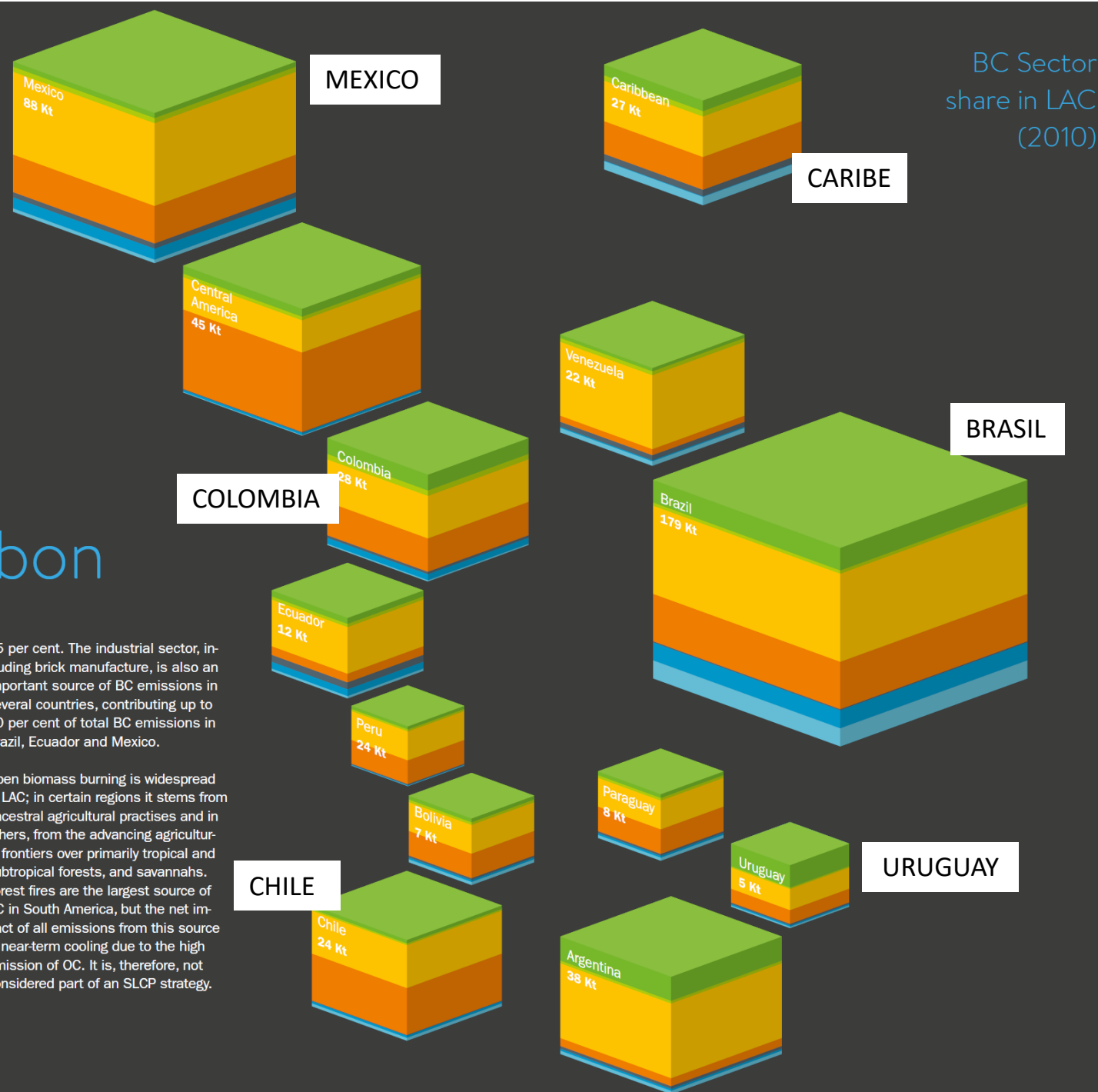


Black carbon

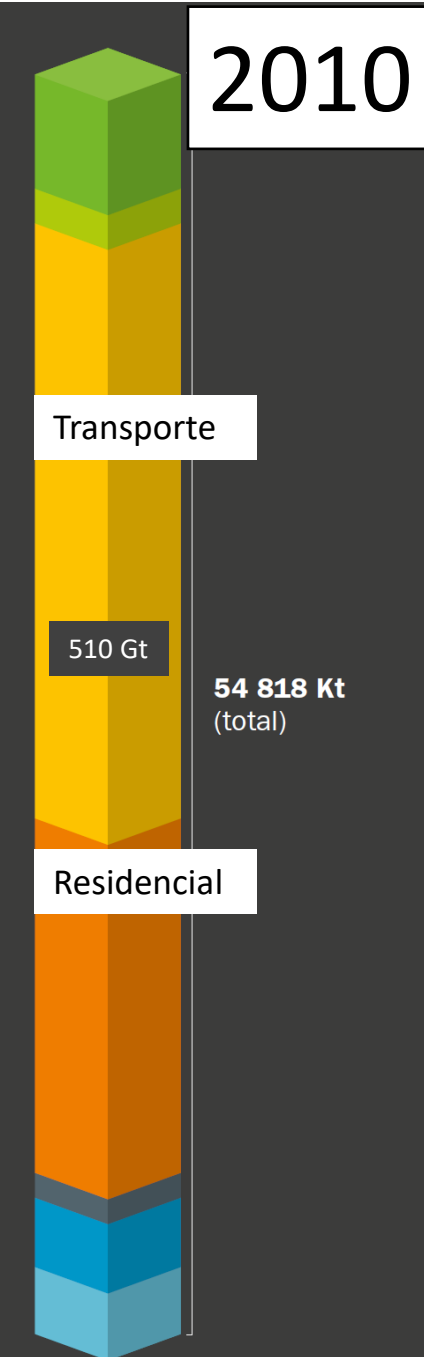
The LAC region emits about 510 Tg of BC (baseline 2010) per year, and is responsible for less than 10 per cent of total global anthropogenic emissions of BC, excluding those from forest and savannah fires. More than 60 per cent of the region's emissions originate in Brazil and Mexico. Two major source sectors emit about three quarters of BC emissions in LAC: transport and the residential combustion of solid fuels (Figure 2). Nationally, the transport sector makes up the largest portion of BC emissions in most countries, other than in Chile, Paraguay and the countries of Central America where residential combustion contributes a higher proportion. The agricultural sector is a significant source in a number of countries including Uruguay, approximately 35 per cent; Argentina, approximately 20 per cent; and Colombia, approximately

15 per cent. The industrial sector, including brick manufacture, is also an important source of BC emissions in several countries, contributing up to 10 per cent of total BC emissions in Brazil, Ecuador and Mexico.

Open biomass burning is widespread in LAC; in certain regions it stems from ancestral agricultural practises and in others, from the advancing agricultural frontiers over primarily tropical and subtropical forests, and savannahs. Forest fires are the largest source of BC in South America, but the net impact of all emissions from this source is near-term cooling due to the high emission of OC. It is, therefore, not considered part of an SLCP strategy.

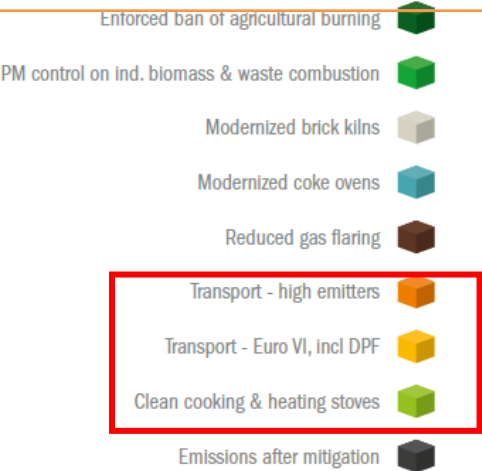


BC Sector share in LAC (2010)

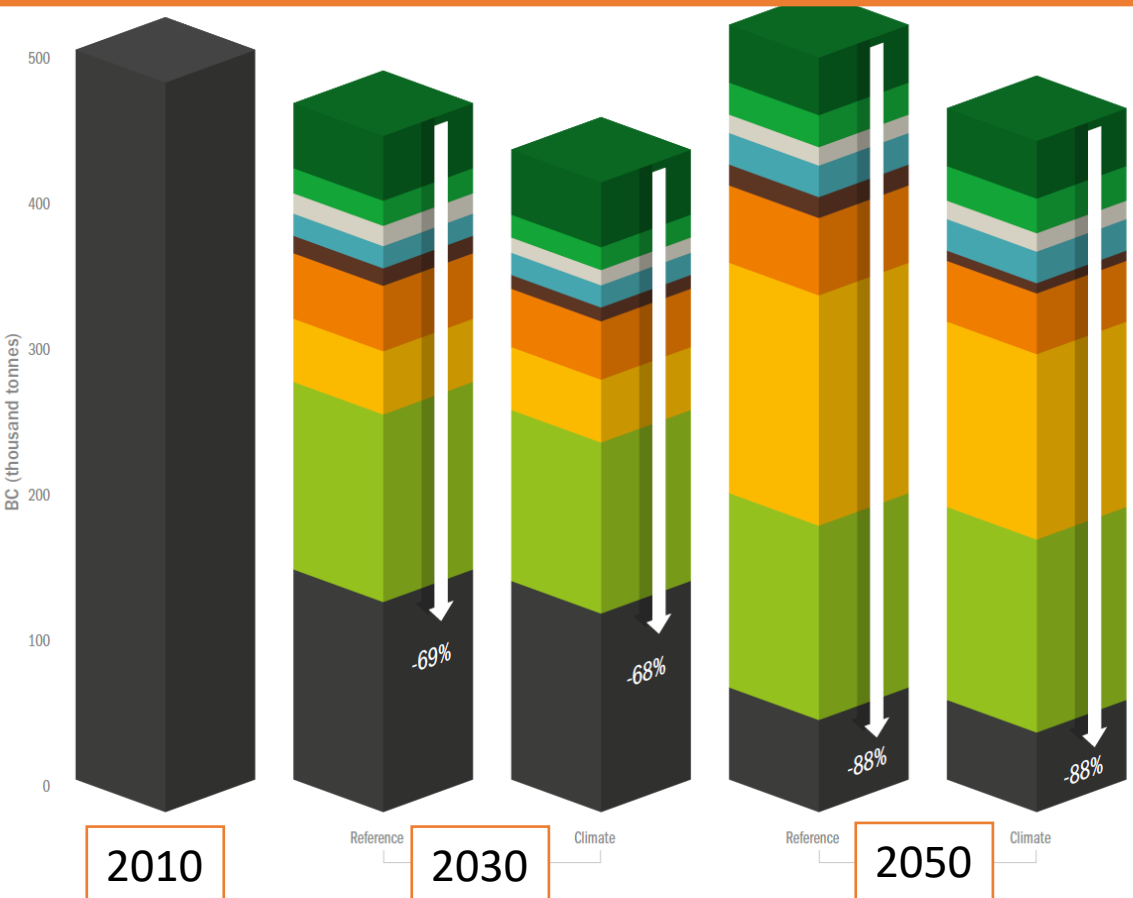


MEDIDAS DE MITIGACIÓN

Residencial	1. Estufas limpias para cocción y calefacción
Transporte	2. Estándar Euro VI para vehículos nuevos y la inclusión de filtros para partículas en vehículos a diésel 3. Eliminación de vehículos de alta emisión (“super and high emitters”)
Agricultura	4. Eliminación de quema agrícola y de pastizales a cielo abierto
Producción y distribución de gas y petróleo	5. Reducción de quema durante venteo



Reducción de emisiones a 2030 y 2050 de la implementación completa del escenario de mitigación de CCVC comparado con escenario de referencia.



El mayor potencial de mitigación de BC en LAC se asocia con transporte (naranja, amarillo) y calefacción y cocción residencial (verde claro)

Beneficios en SALUD

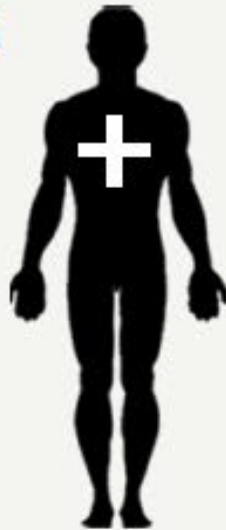
resultado de la implementación de medidas para mitigar CARBONO NEGRO y OZONO (via METANO)

2030

HEALTH BENEFITS FROM SLCP MEASURES IN LAC



fewer deaths from particulate matter
and ozone air pollution in 2030



2050



fewer deaths from particulate matter
and ozone pollution in 2050

* compared to business-as-usual scenario

BENEFICIOS POTENCIALES al 2050 de implementar medidas de mitigación de CCVC:

- Reducir el calentamiento en LAC en hasta 0.9° C
- Reducir la mortalidad prematura en por lo menos 26% debido a reducciones en PM_{2.5} y ozono, principalmente en las regiones urbanas de LAC
- Evitar pérdidas de rendimiento de 3-4 millón toneladas de 4 cultivos (maíz, trigo, soya y arroz)

OPORTUNIDADES ADICIONALES al 2050 :

- Optimización de eficiencia energética en inmuebles
- Transición a energías renovables en generación eléctrica
- Transición a tecnologías limpias en transporte público y de carga