

La ciencia del metano:

¿Qué es el metano y por qué es tan importante controlar sus emisiones?

Observatorio Mexicano de Emisiones de Metano | webinar 1ro de Marzo, 2023

Dr. Daniel Zavala



Metano es responsable de
cerca del 30% del
calentamiento que
experimentamos hoy en día

(des)acelerar la crisis
climática



Environmental
Defense
Fund



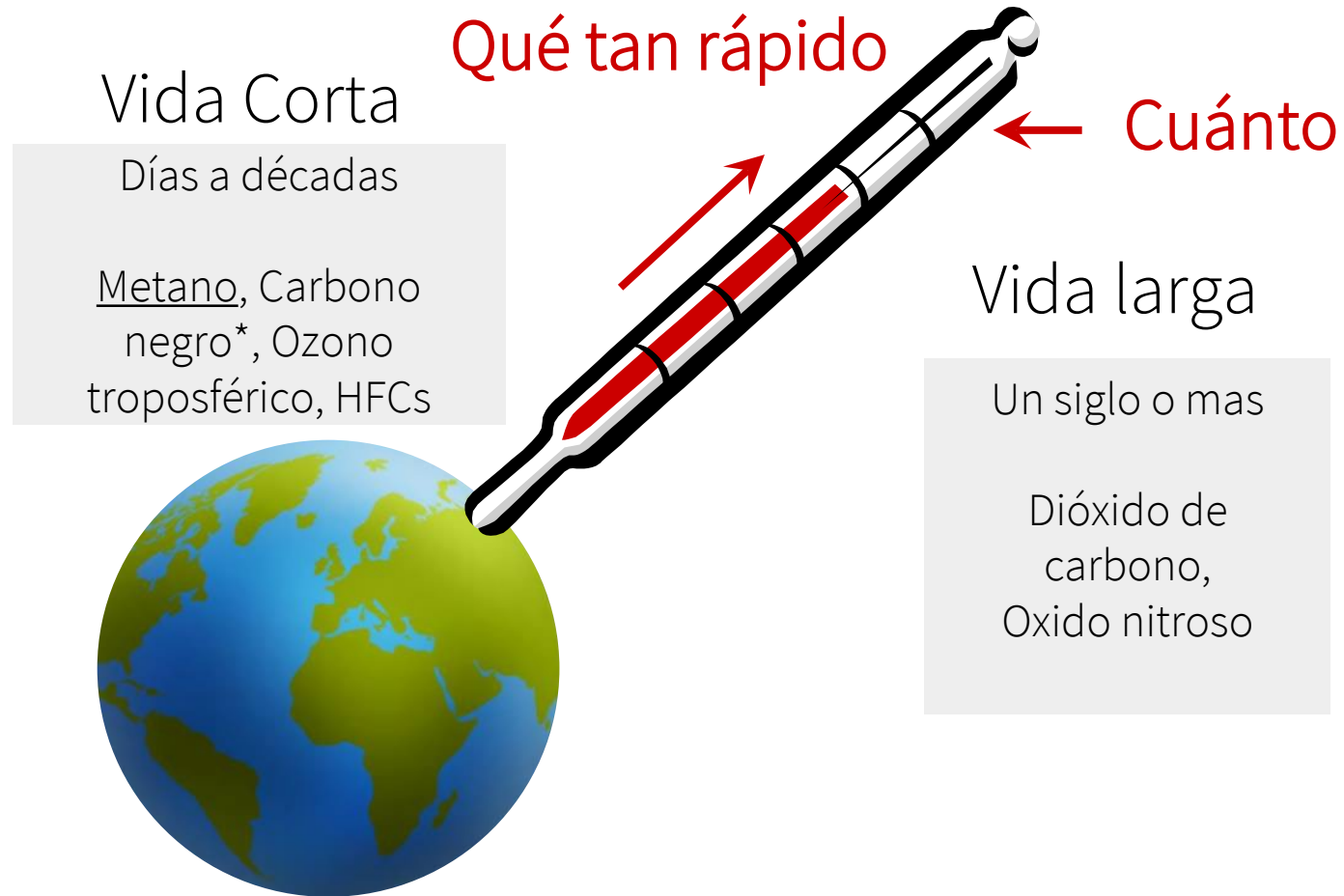
Acción global en mitigación de metano en esta década podría **prevenir:**

5.6 millones de muertes prematuras por ozono

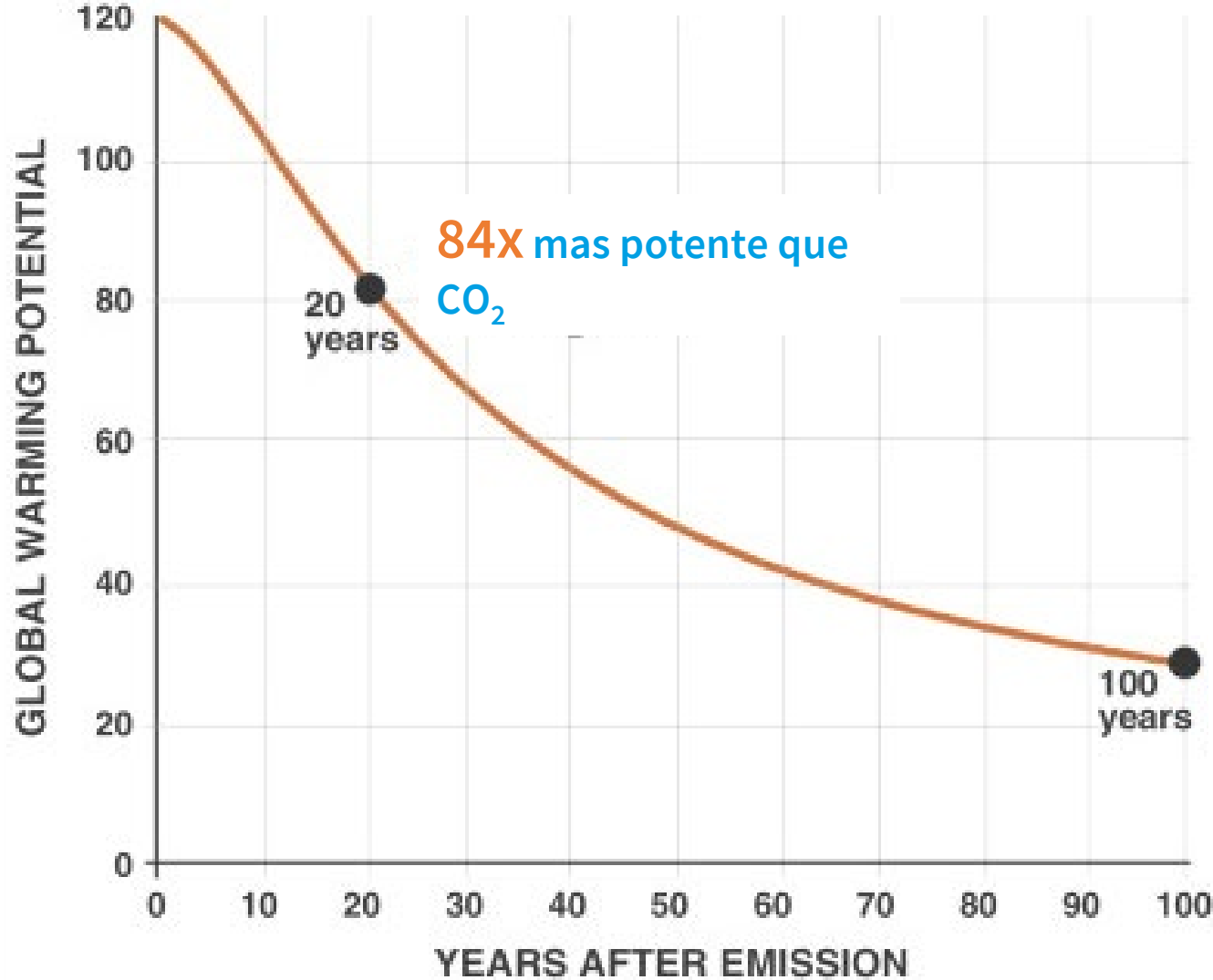
Pérdidas de cerca de 600 millones de toneladas de trigo, maíz, arroz, soya

Pérdidas de \$500,000 millones de dólares por impactos a la salud, impactos forestales y agricultura

Reducir emisiones de metano: necesario (no suficiente) para limitar calentamiento global a 1.5 grados



Calentamiento directo e indirecto del metano



Tratado de Paris no puede cumplirse sin
reducciones a contaminación de metano
Reducción de 40-45% para 2030

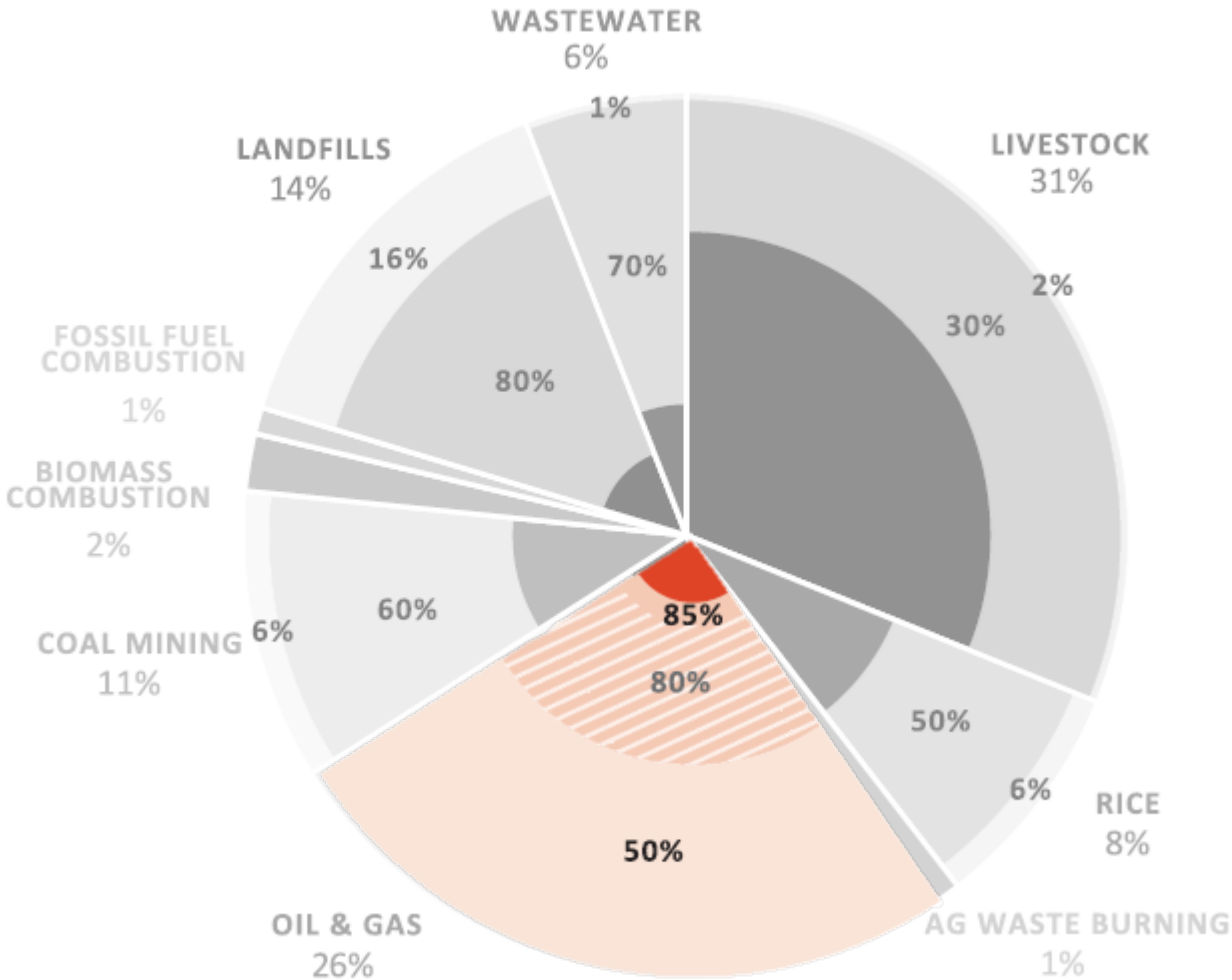
28x mas potente que
CO₂

Para 2030, emisiones mundiales se pueden reducir a la mitad

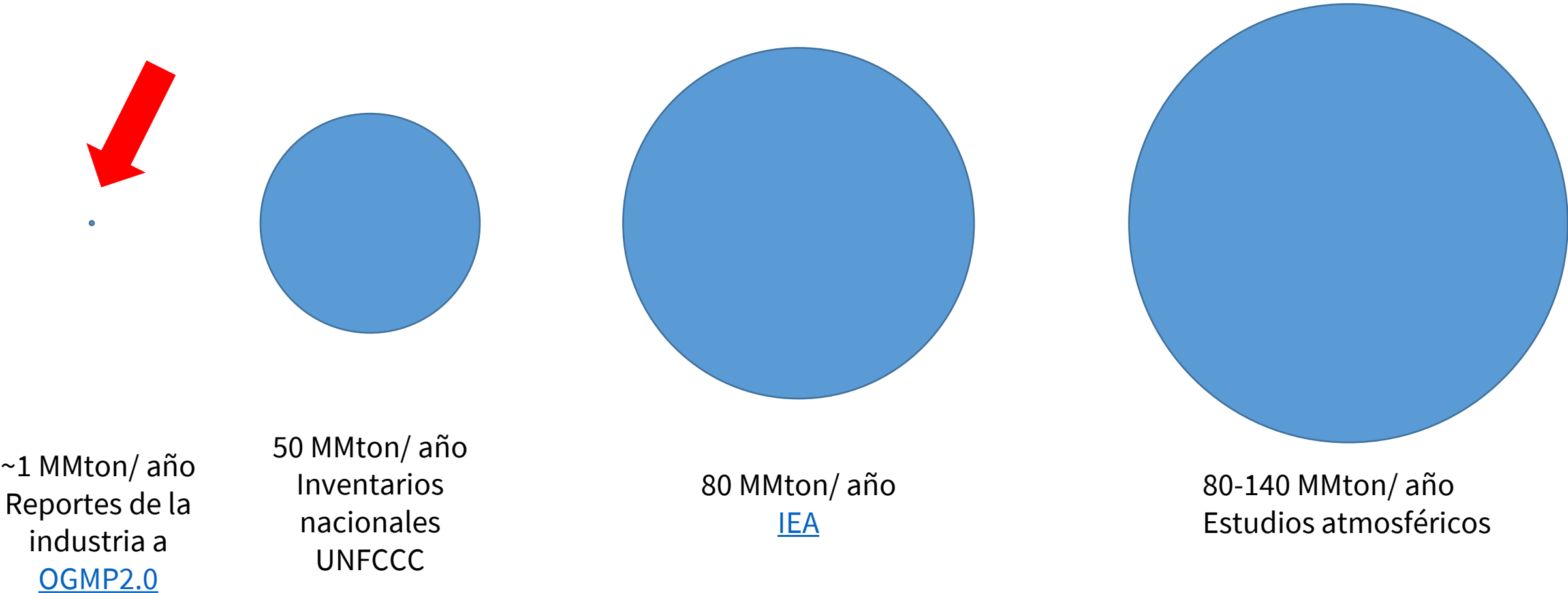
Evitar incremento de **0.25 C** al 2050 y **0.5 C** al 2100

Sin costo ←

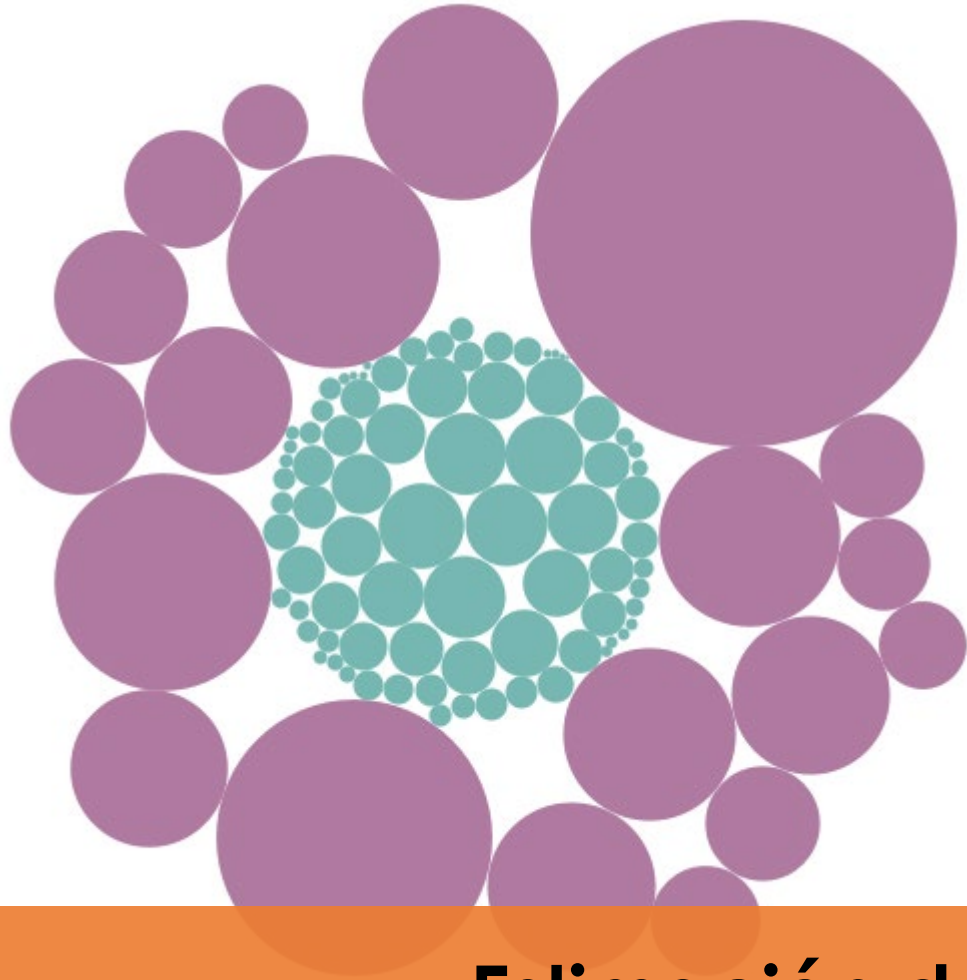
GLOBAL ANTHROPOGENIC METHANE EMISSIONS IN 2030



Emisiones globales del sector hidrocarburos: emisiones son mayores a lo reportado



No todas las instalaciones son iguales



Super emisores 20% de instalaciones, 80% de emisiones

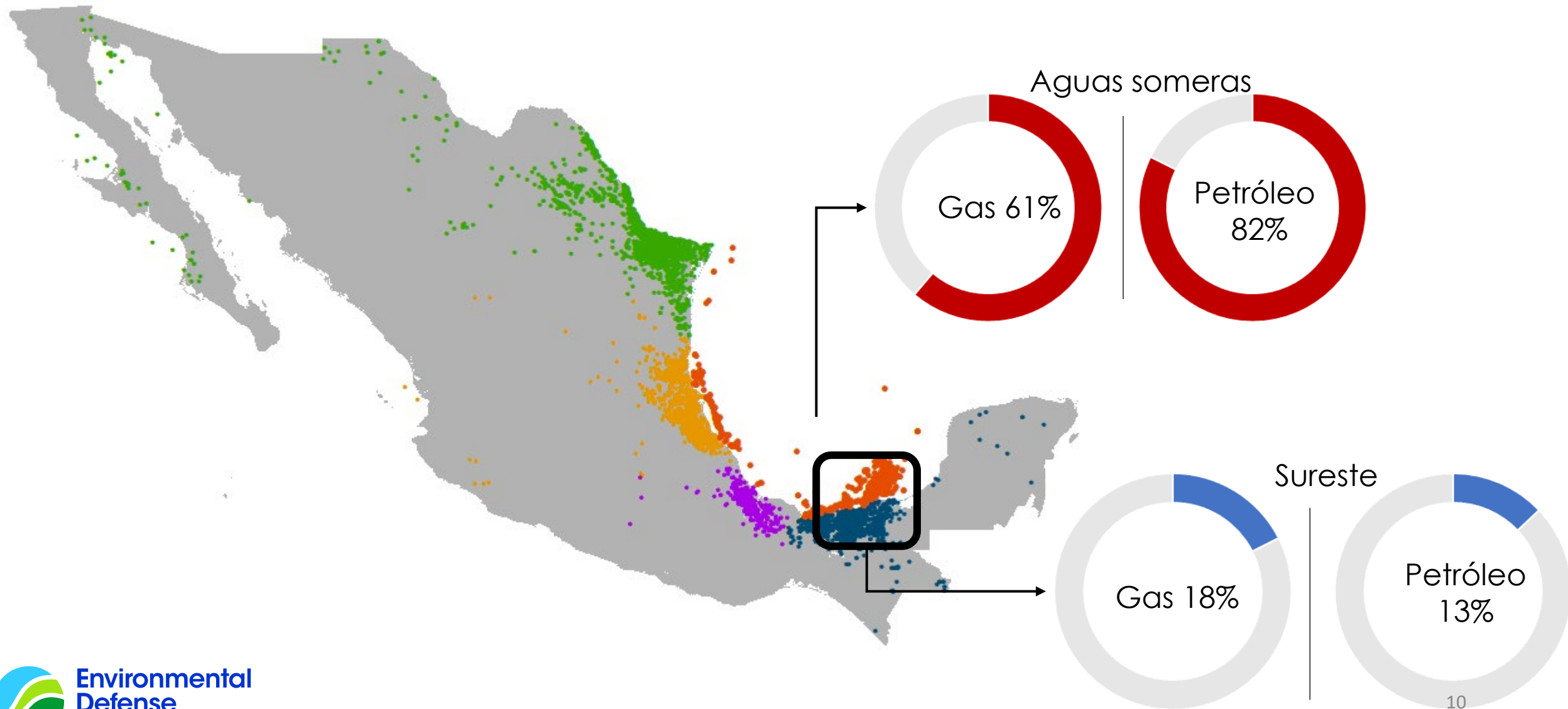
Estimación de emisiones | Mitigación

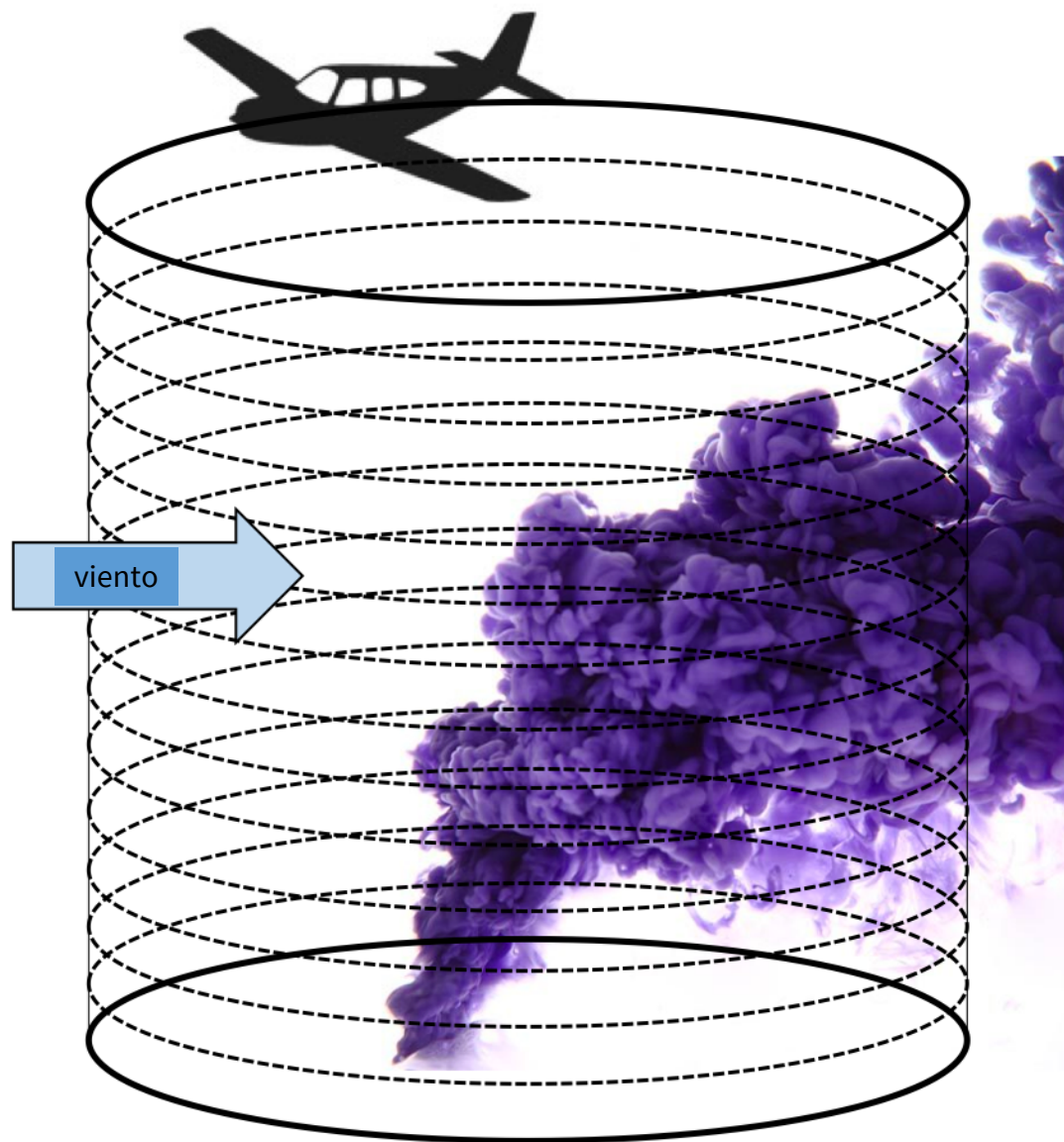
Altas emisiones de metano en nuestro país



Producción sector hidrocarburos

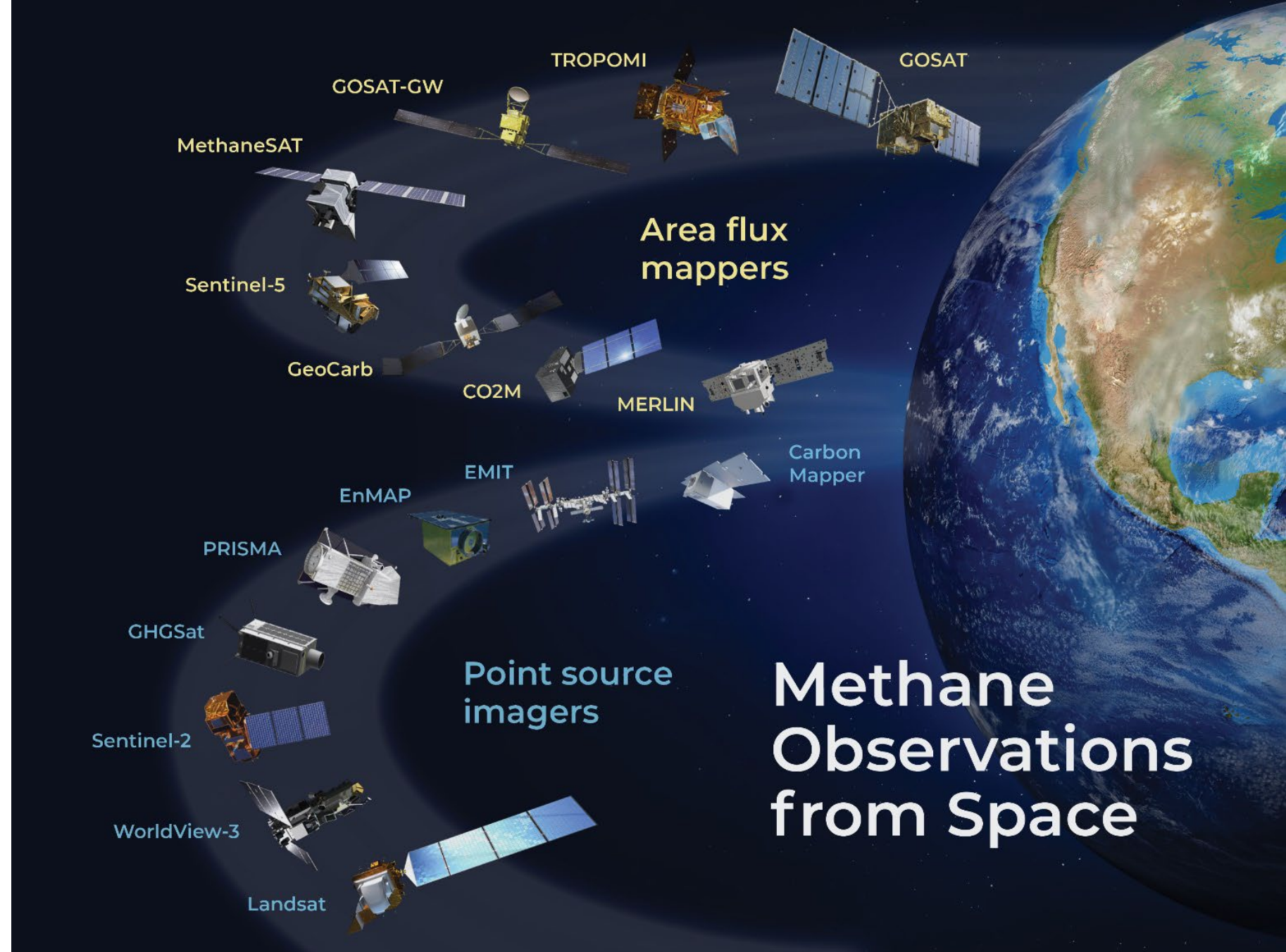
Región del estudio





(Cortesía de Scientific Aviation)

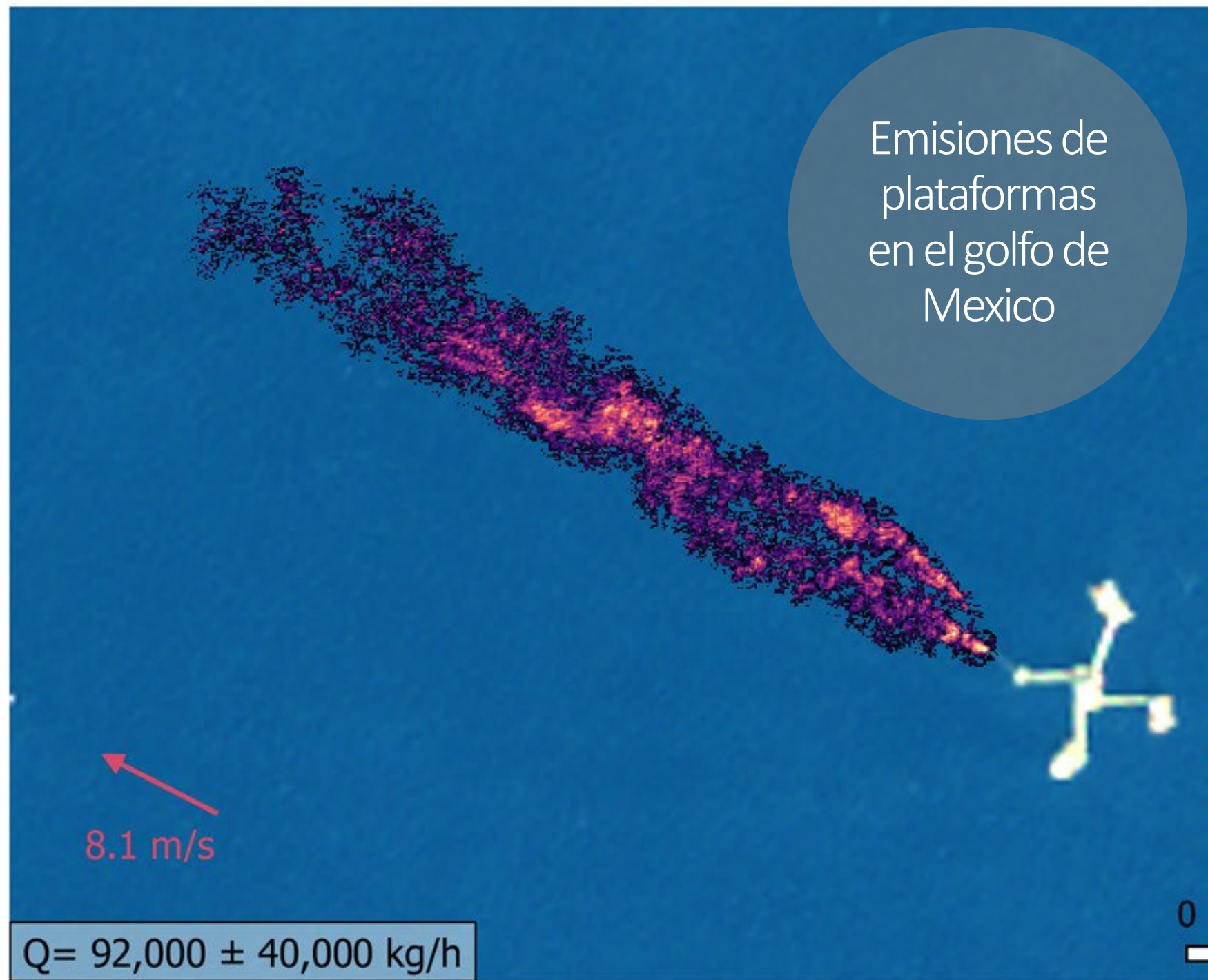
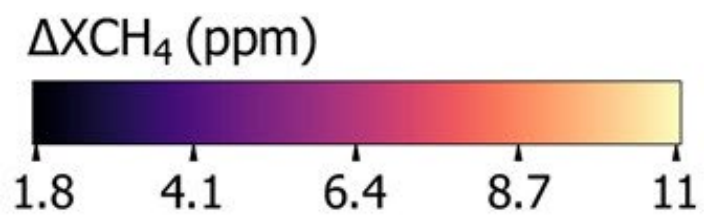
Transparencia climática



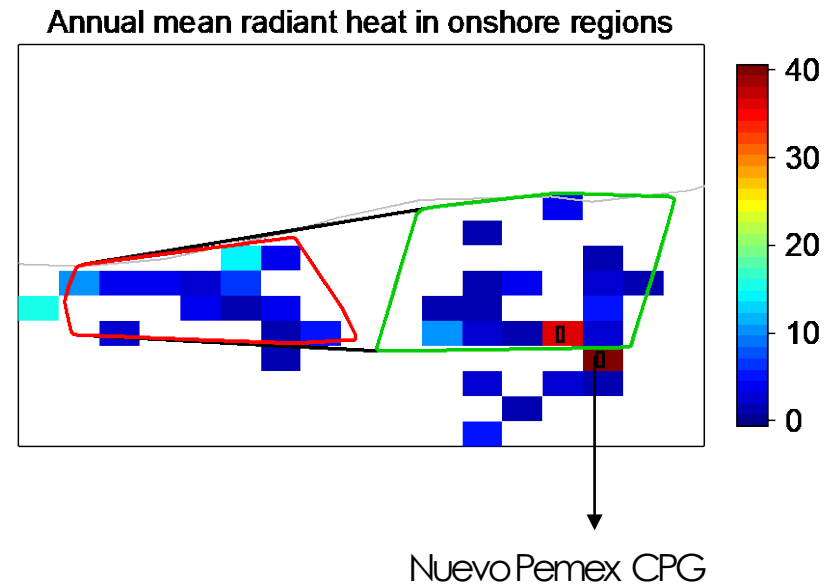
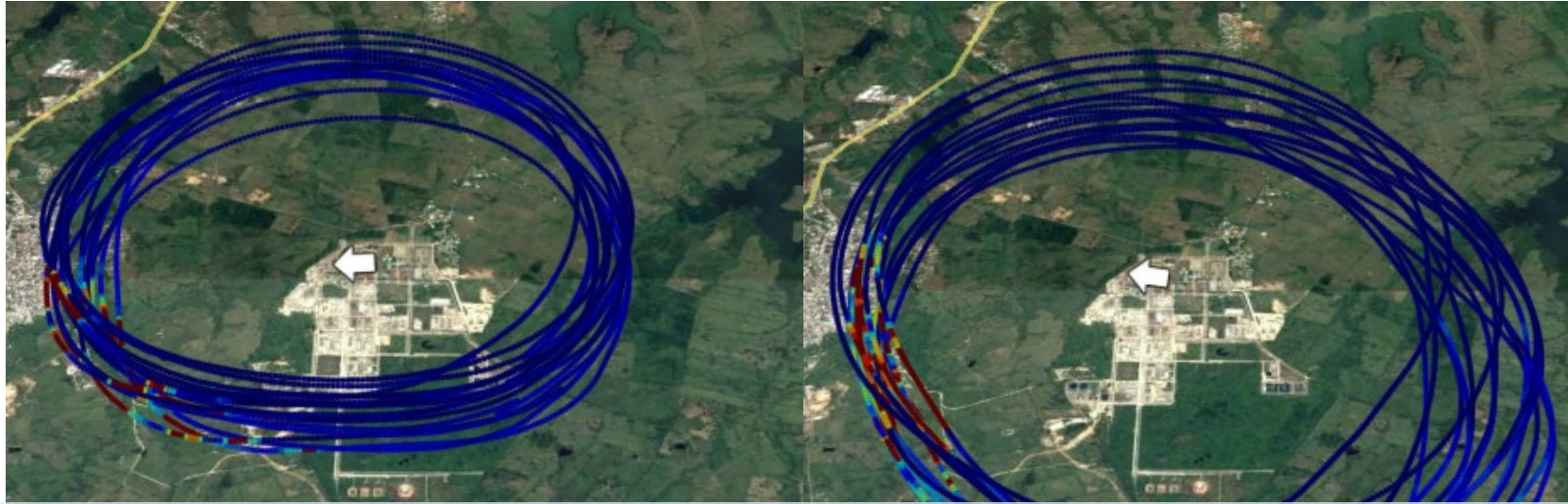


[Irakulis-Loitxate et al. 2022](#)

WorldView3:
December 18, 2021



Nuevo Pemex CPG



Resultados satelitales comprueban que quema de gas elevada ha ocurrido por lo menos por últimos dos años.

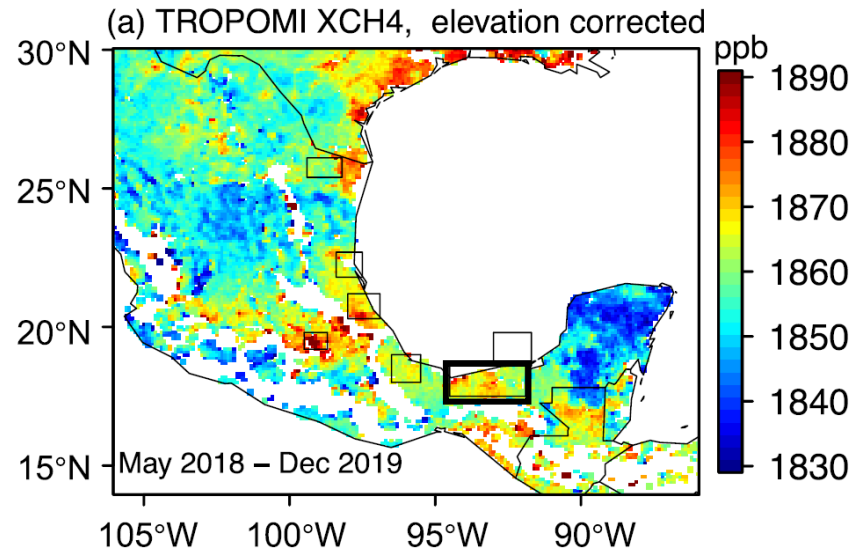
Mediciones:

5,700 kg/h

~70% de las emisiones relacionadas a quema de gas

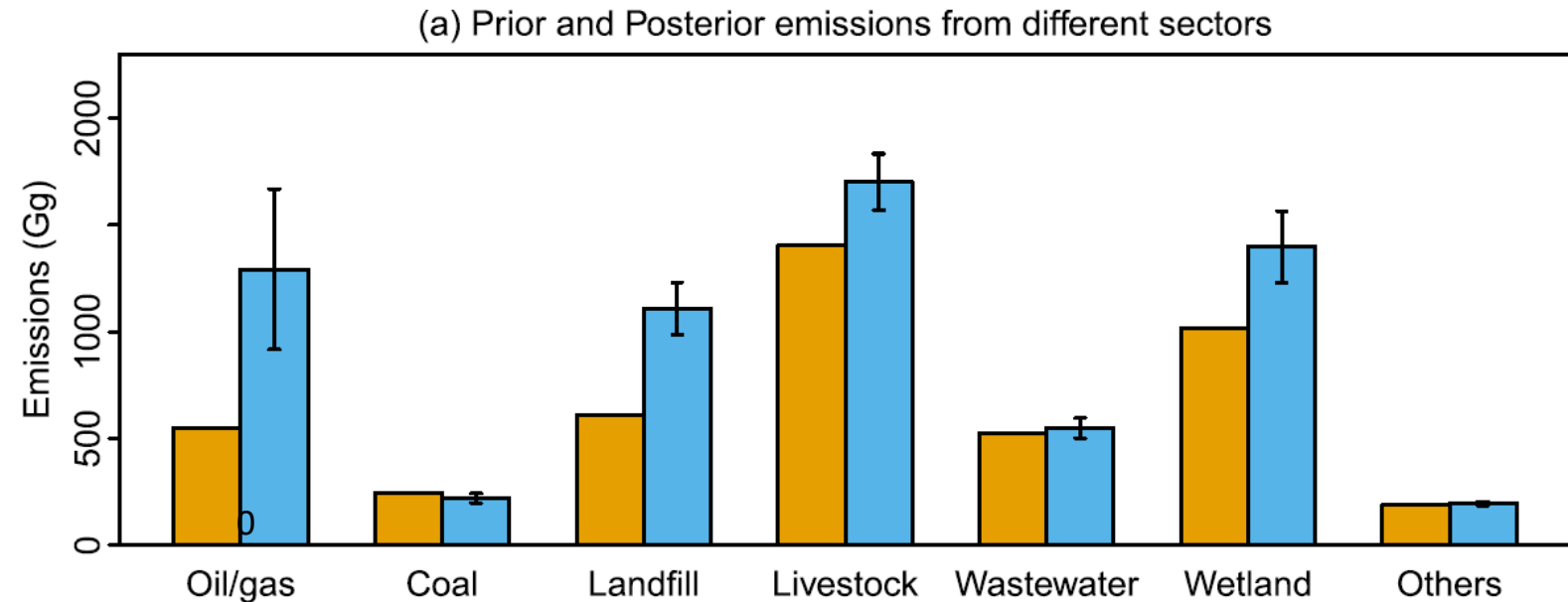
Eficiencia: ~94% (basada en mediciones con la avioneta)

Datos satelitales y sobrevuelos



Cuenca del sureste concentra 50% de las emisiones nacionales del sector hidrocarburos.

Emisiones del sector hidrocarburos son 2x lo reportado en el inventario nacional (**fuga de metano de 4.7%**)



(Fuente: [Shen, et al. 2021](#); [Zavala-Araiza et al. 2021](#))

Quema total de gas en
regiones estudiadas:

280 MMpcd

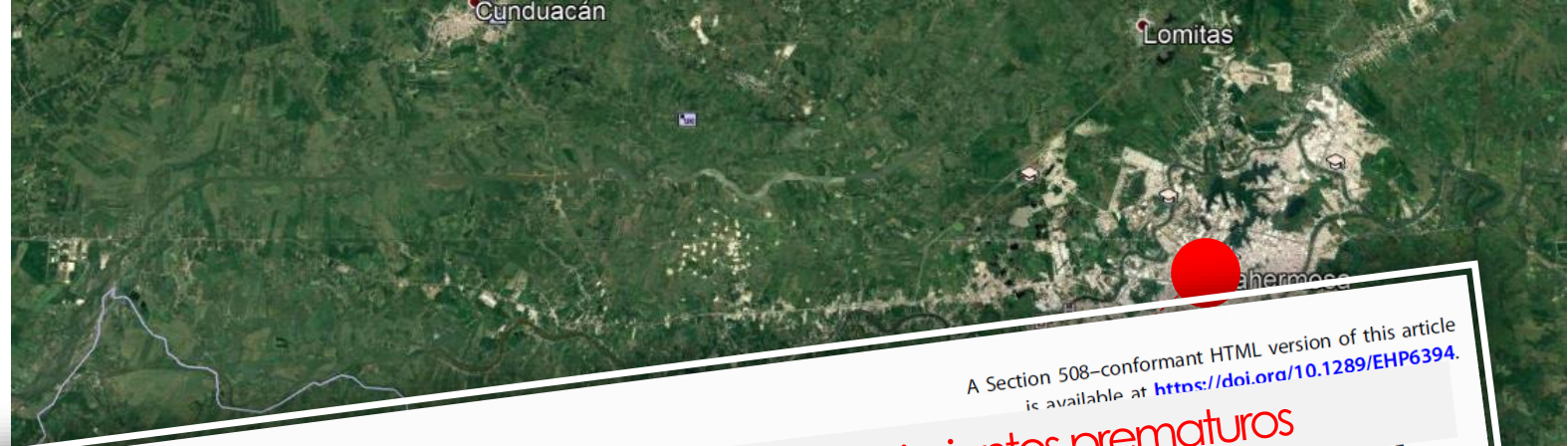
Eficiencia energética:



Impacto económico pérdida de **4,000 millones de pesos al año**



Nuevo Pemex: implicaciones a salud y calidad del aire quema incompleta



A Section 508-conformant HTML version of this article is available at <https://doi.org/10.1289/EHP6394>.

Research

Incremento significativo en probabilidad de nacimientos prematuros Flaring from Unconventional Oil and Gas Development and Birth Outcomes in the Eagle Ford Shale in South Texas

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BACKGROUND: Prior studies suggest exposure to oil and gas development (OGD) adversely affects birth outcomes, but no studies have examined flaring—the open combustion of natural gas—from OGD.

OBJECTIVES: We investigated whether residential proximity to flaring from OGD was associated with shorter gestation and reduced fetal growth in the Eagle Ford Shale of south Texas.

METHODS: We conducted a retrospective cohort study using administrative birth records from 2012 to 2015 ($N = 23,487$) and satellite observations of flaring activity during pregnancy within 5 km of maternal residence. Multivariate logistic and linear regression models were used to estimate associations between four outcomes (preterm birth, small-for-gestational age, continuous gestational age, and term birthweight) and exposure to a low (1–9) or high (≥ 10) number of nightly flare events, as compared with no exposure, while controlling for known maternal risk factors. We also examined associations with the number of oil and gas wells within 5 km using data from DrillingInfo (now Enverus).

RESULTS: Exposure to a high number of nightly flare events was associated with a 50% higher odds of preterm birth [odds ratio (OR) = 1.50 (95% CI: 1.23, 1.83)] and shorter gestation [mean difference = -1.9 (95% CI: $-2.8, -0.9$) d] compared with no exposure. Effect estimates were slightly higher after adjustment for the number of wells within 5 km. In stratified models these associations were present only among Hispanic women. Shorter gestation was not significantly associated. Women exposed to a high number of wells (fourth quartile, ≥ 27) vs. no wells had a 31% higher odds of preterm birth [OR = 1.31 (95% CI: 1.14, 1.49)], shorter gestation [-1.3 (95% CI: $-1.9, -0.8$) d], and lower average birthweight [-100 g (95% CI: $-150, -50$) g]. Our findings need to be confirmed in other populations.

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