

# SPACE TOOLS IN SUPPORT OF ESG REPORTING AND VERIFICATION

EU SPACE WEEK - NOV 2023

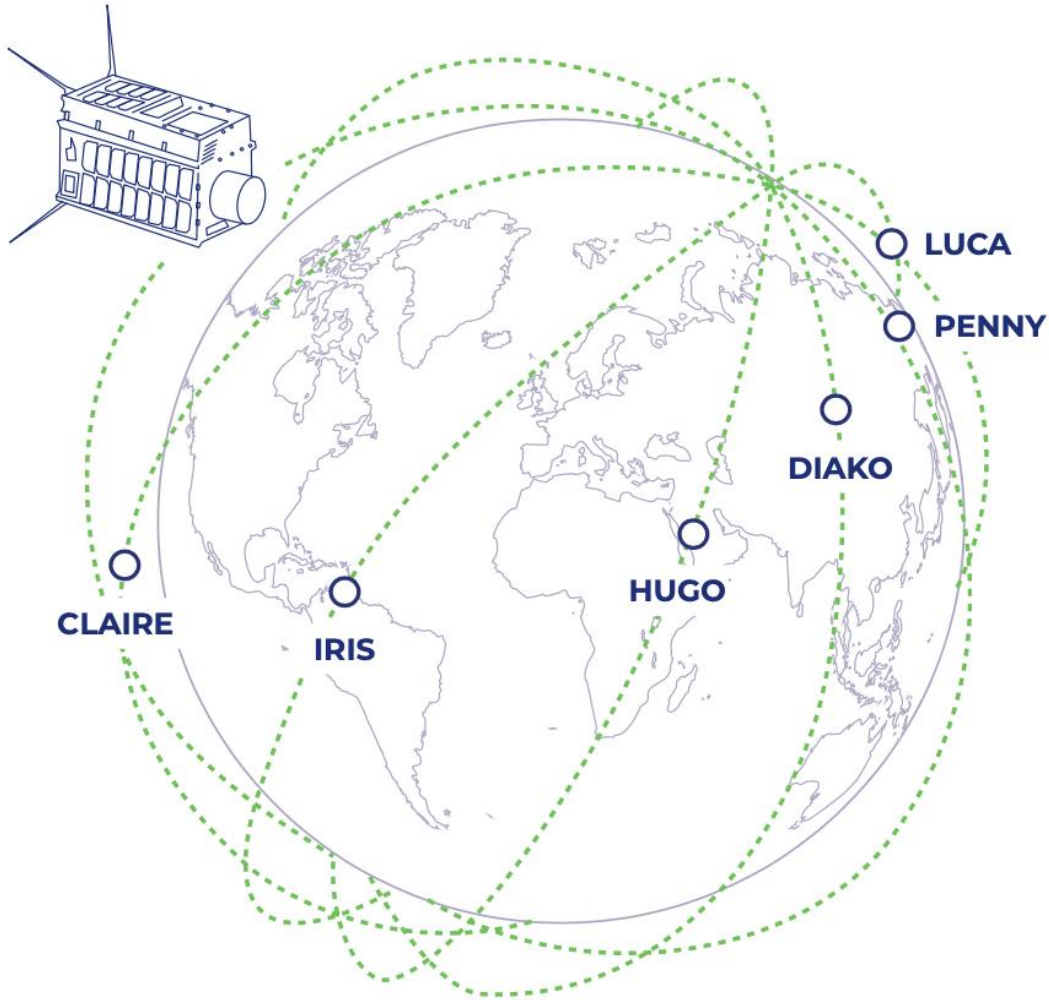
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# INTRO GHGSAT: METHANE MONITORING SATELLITES

Biggest operational and commercial GHG monitoring constellation



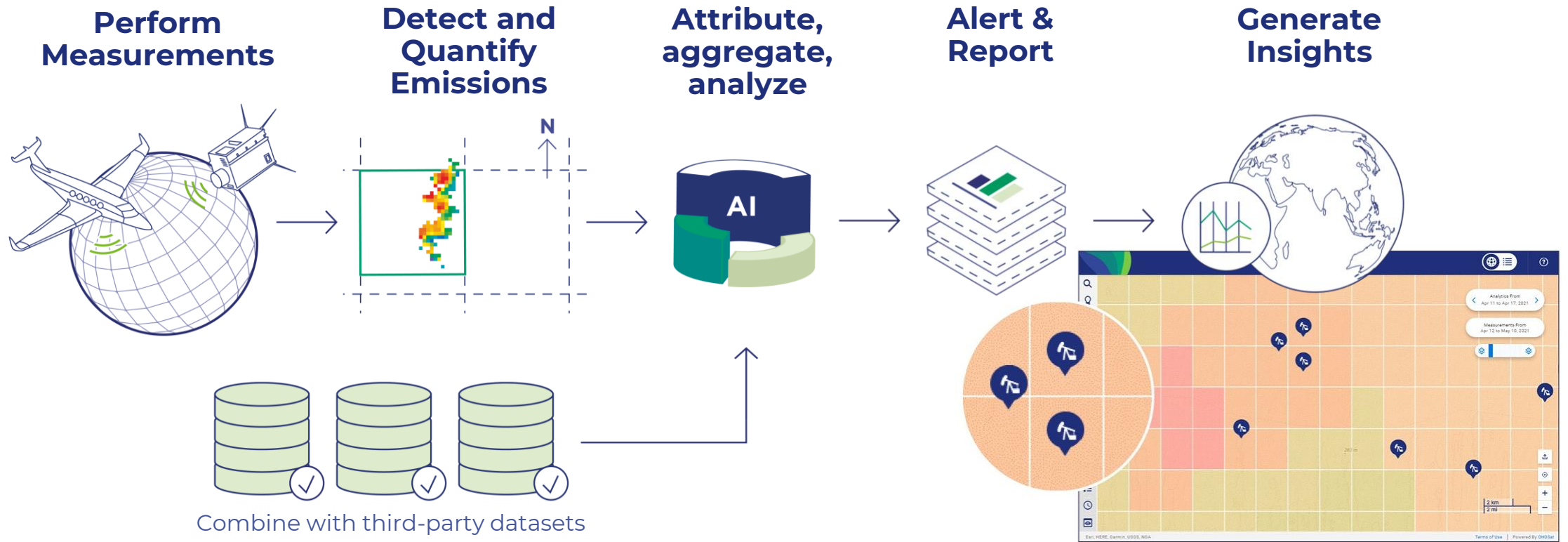
	<u>2022</u>	<u>2023</u>	<u>2026</u>
Satellites in orbit	6	12	100
Facility Measurements per Year	1M+	3M+	20M+

- Can measure facilities anywhere in the world
- Can revisit any targeted facility on daily basis as of end of 2023
- Most important constraints are daylight and clouds
- **Satellite #12 will be tuned for CO2**



# TECHNOLOGY

## GHGSat workflow - from measurement to insight





# GHG EMISSIONS INTELLIGENCE

One solution applicable to multiple emission issues



## Energy

Wells, batteries, compressor stations, pipelines, tailing ponds, etc.



## Waste Management

Landfills, waste water, etc.



## Agriculture

Animal feedlots and waste recovery



## Mining

Underground and open pit coal mines, and coalbed methane production



## ESG & Carbon Markets

ESG compliance, decarbonization metrics, carbon trading, emission credits





# EO FOR VERIFICATION IN ESG & CARBON MARKETS

## Challenges

- Additional
- Verifiable
- Not counted double
- No leakage
- Permanent



## Opportunities of EO data

- Combining archive data & future taskings to track pre and post conditions
- Unbiased, independent data
- Worldwide coverage, scalable
- Frequent, increasingly available
- Cost-effective tool for the job

**Still Carbon offsets and EO data are sometimes met with skepticism!**

# CARBON REMOVAL VS CARBON AVOIDANCE



- Main focus in the carbon markets is on carbon removals (i.e. forest carbon, LULUCF)
- Not too much on carbon emissions removals (or methane in CO2 equivalents)

Removing methane is very difficult



Focus on avoiding these emissions instead?

## Practical constraints on atmospheric methane removal

Klaus S. Lackner

[Nature Sustainability](#) 3, 357 (2020) | [Cite this article](#)

17k Accesses | 17 Citations | 32 Altmetric | [Metrics](#)

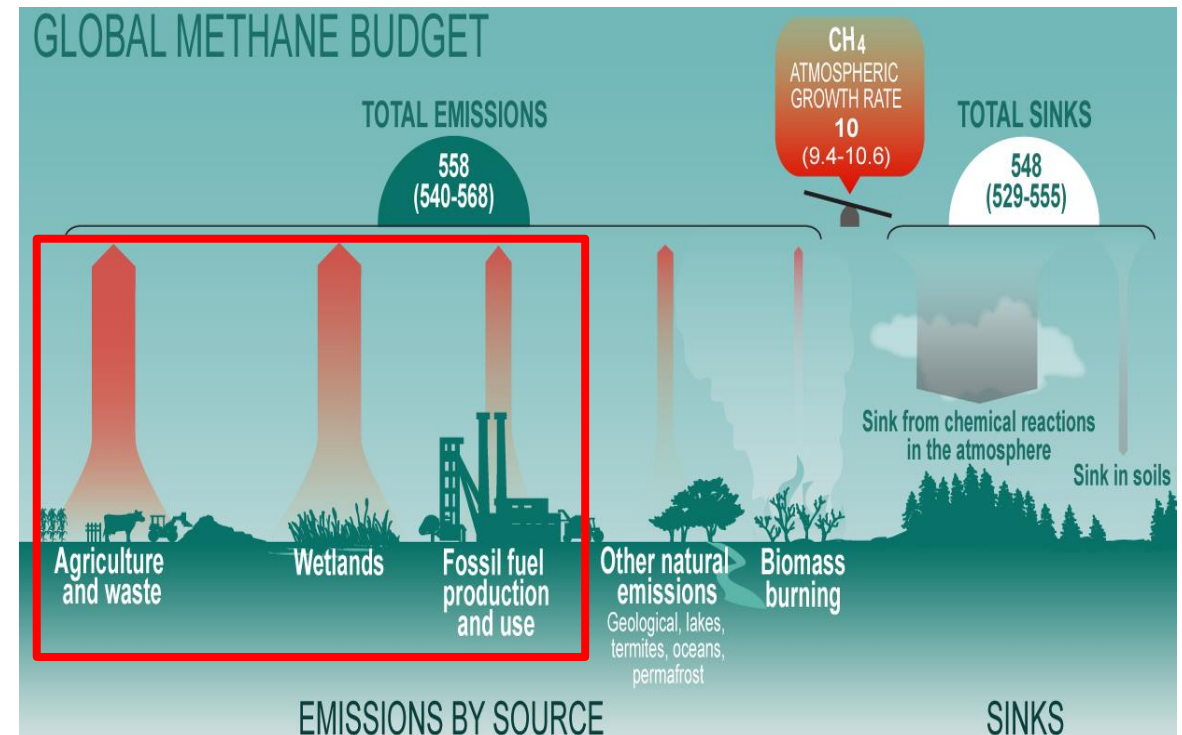
[Matters Arising](#) to this article was published on 23 March 2020

The [Original Article](#) was published on 20 May 2019

## Is the destruction or removal of atmospheric methane a worthwhile option?

Peter B. R. Nisbet-Jones<sup>†</sup> , Julianne M. Fernandez, Rebecca E. Fisher, James L. France, David Lowry, David A. Waltham, Ceres A. Woolley Maisch and Euan G. Nisbet

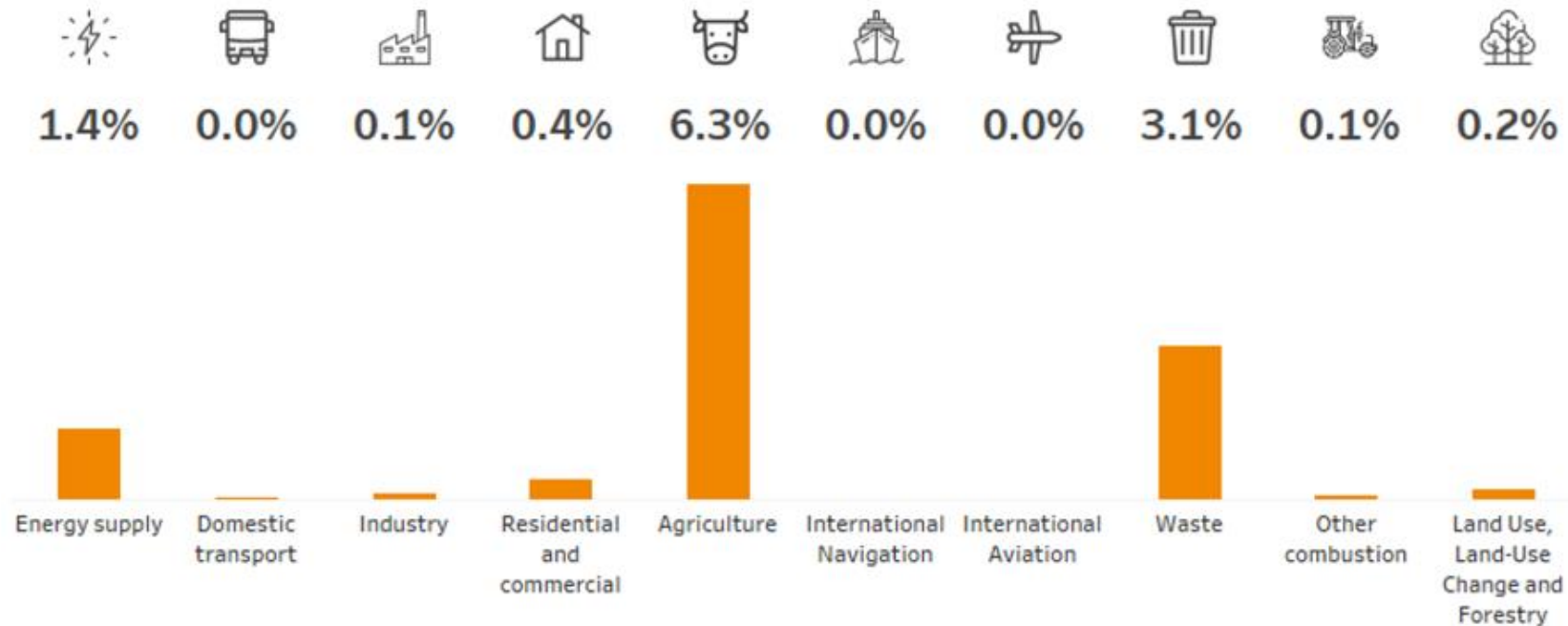
Published: 06 December 2021 | <https://doi.org/10.1098/rsta.2021.0108>



# DON'T FORGET METHANE



Methane emissions as Percent of total GHG emissions in 2020  
in EU-27



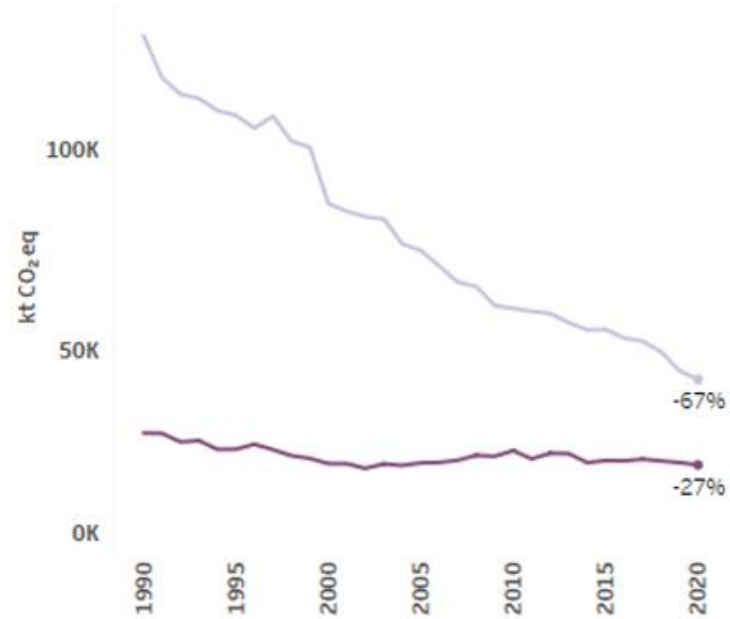
Source: EAA 2023

**Have carbon markets overlooked the opportunity to create a new classes of GHG reductions?**

# DON'T FORGET METHANE



Trends in methane emissions from the energy sector  
EU-27



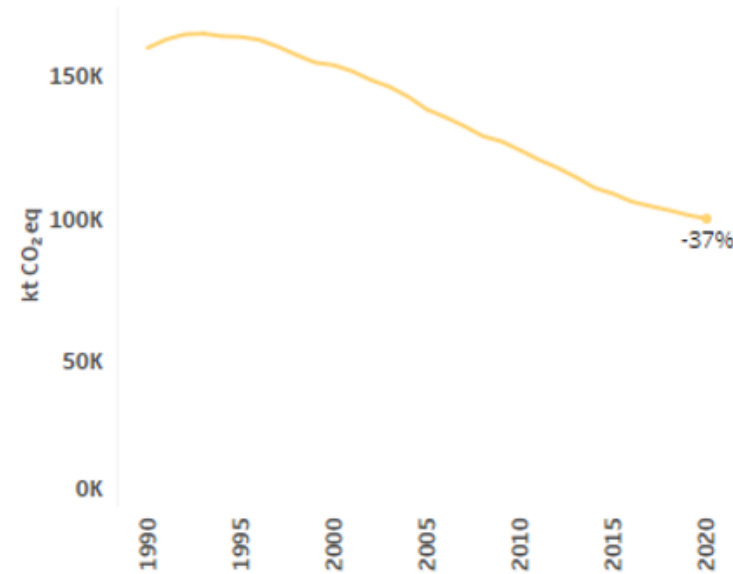
Fuel combustion



Fugitive emissions



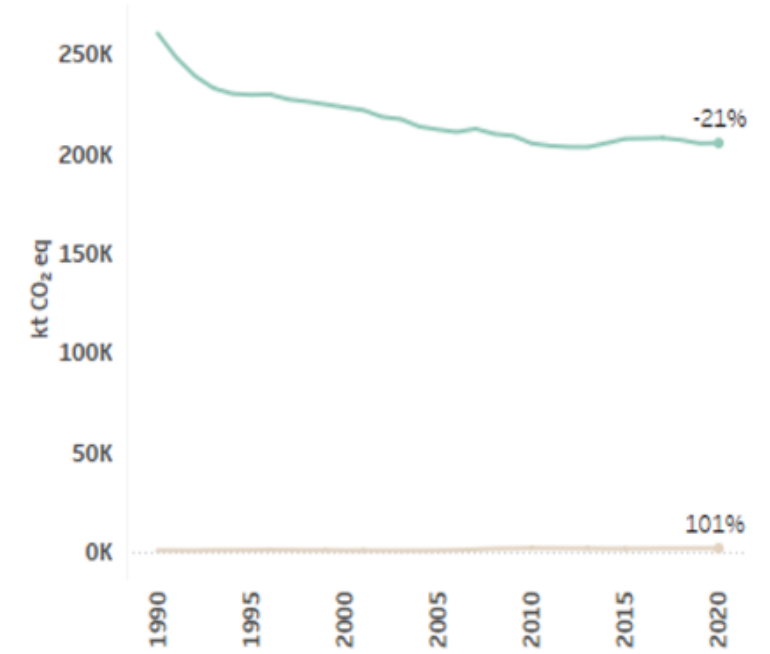
Trends in methane emissions from waste management  
EU-27



Waste management



Trends in methane emissions from agriculture  
EU-27



Agriculture



Energy combustion

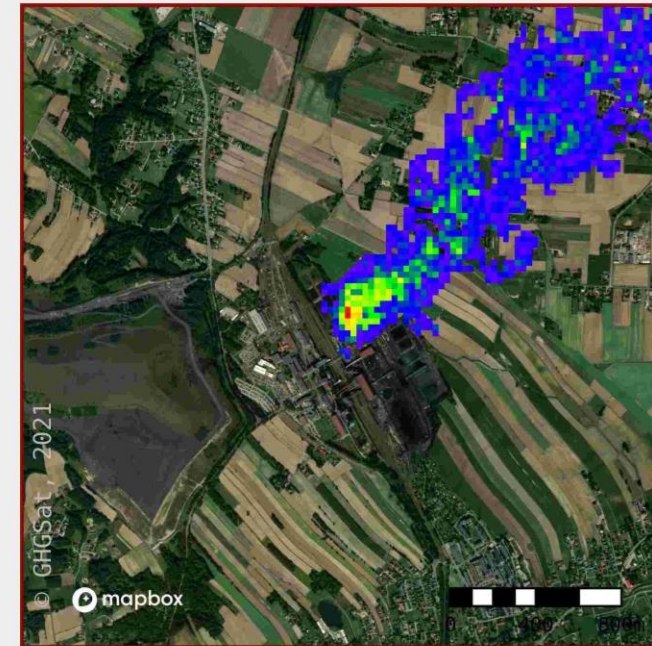
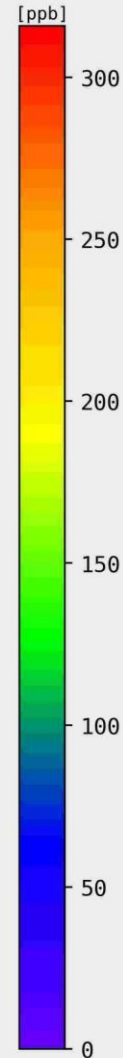
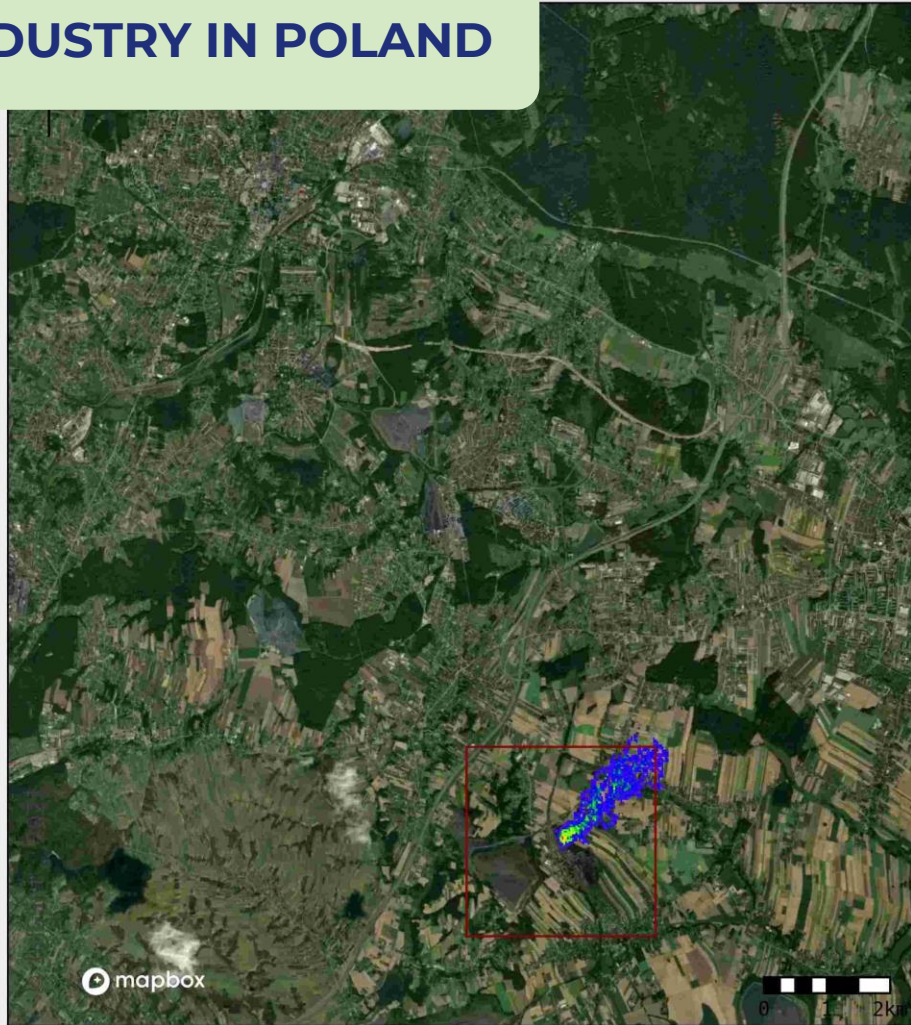
Source: EAA 2023



# DON'T FORGET METHANE – IN EUROPE TOO

Opportunities for emissions avoidance in our backyard

## COAL INDUSTRY IN POLAND



Product:  
Column averaged CH<sub>4</sub> concentration in excess of local background.  
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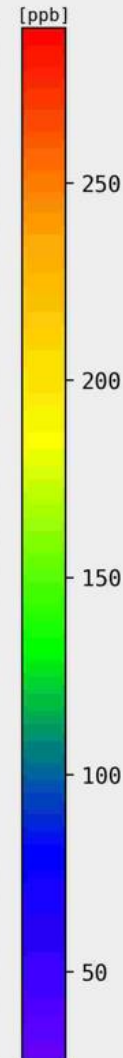
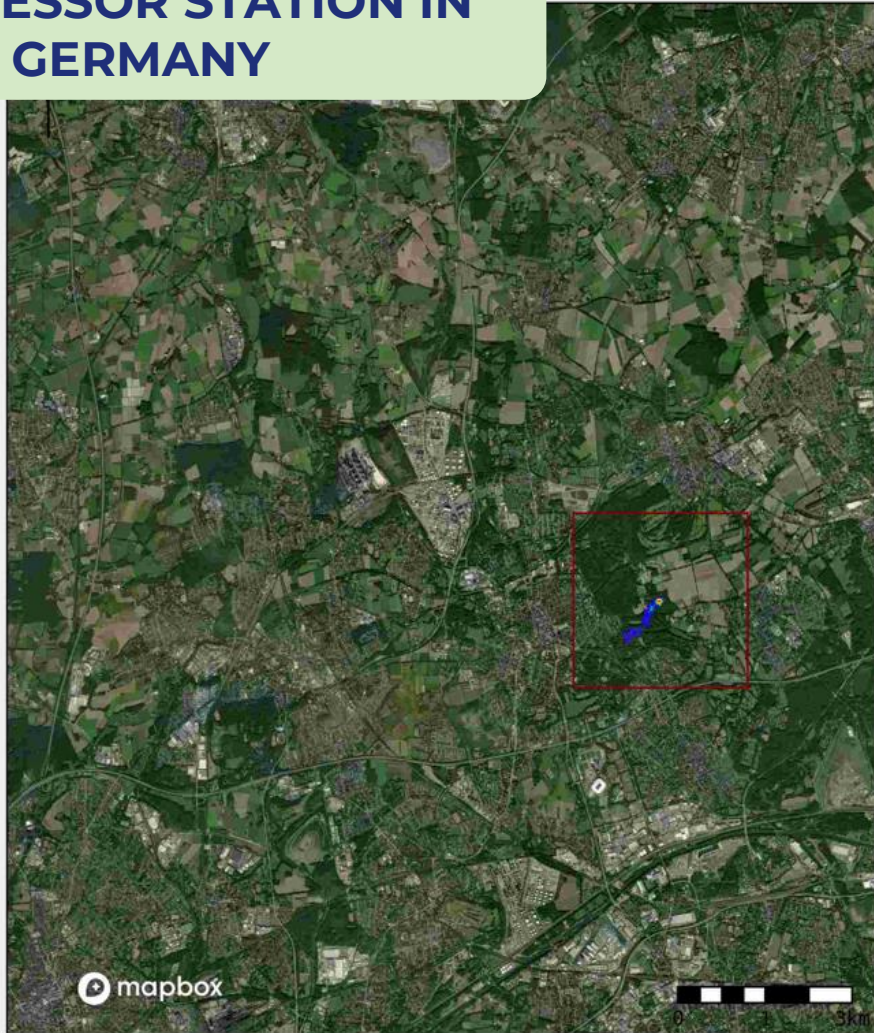




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## COMPRESSOR STATION IN GERMANY



Product:  
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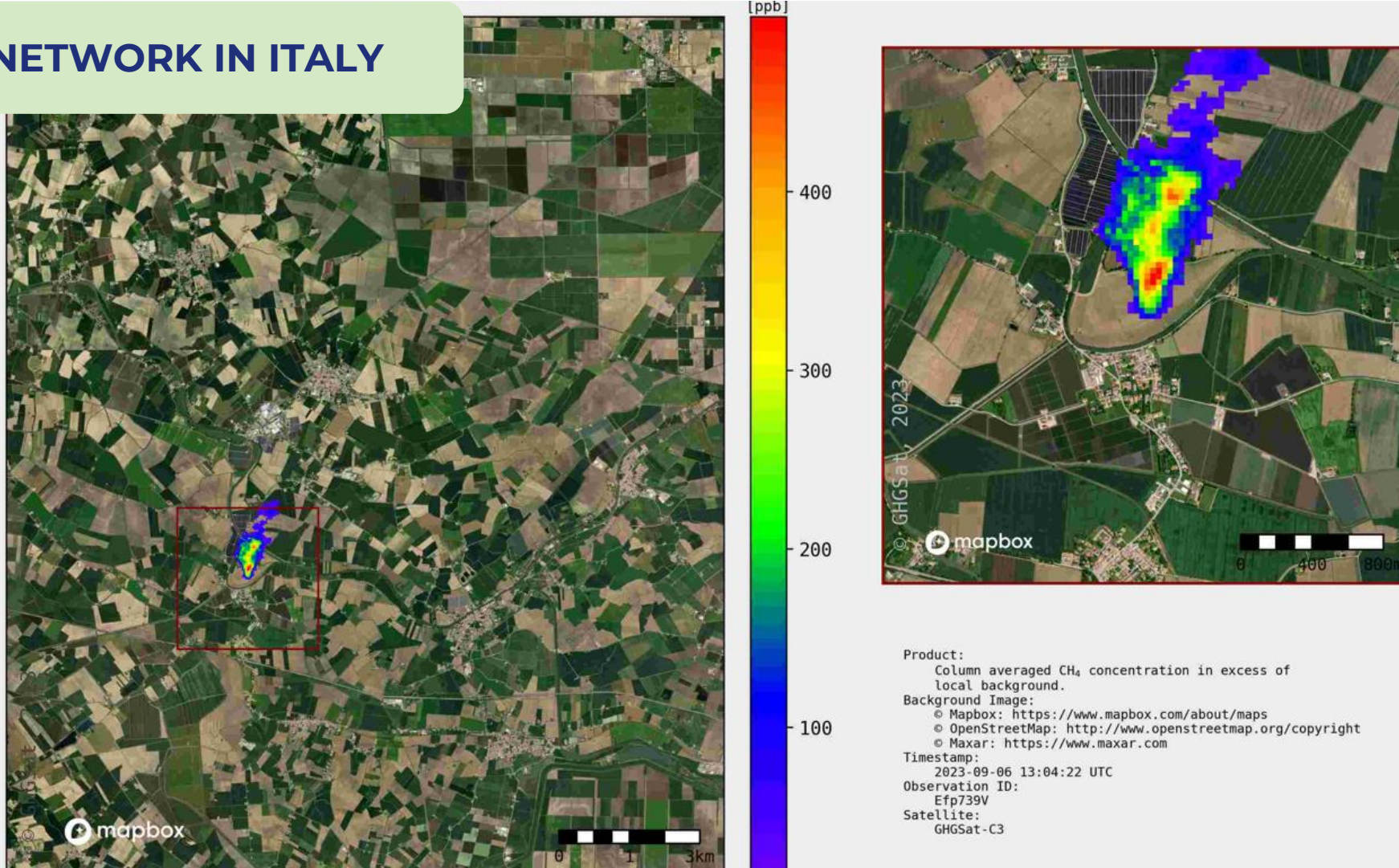




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## GAS NETWORK IN ITALY



Company confidential

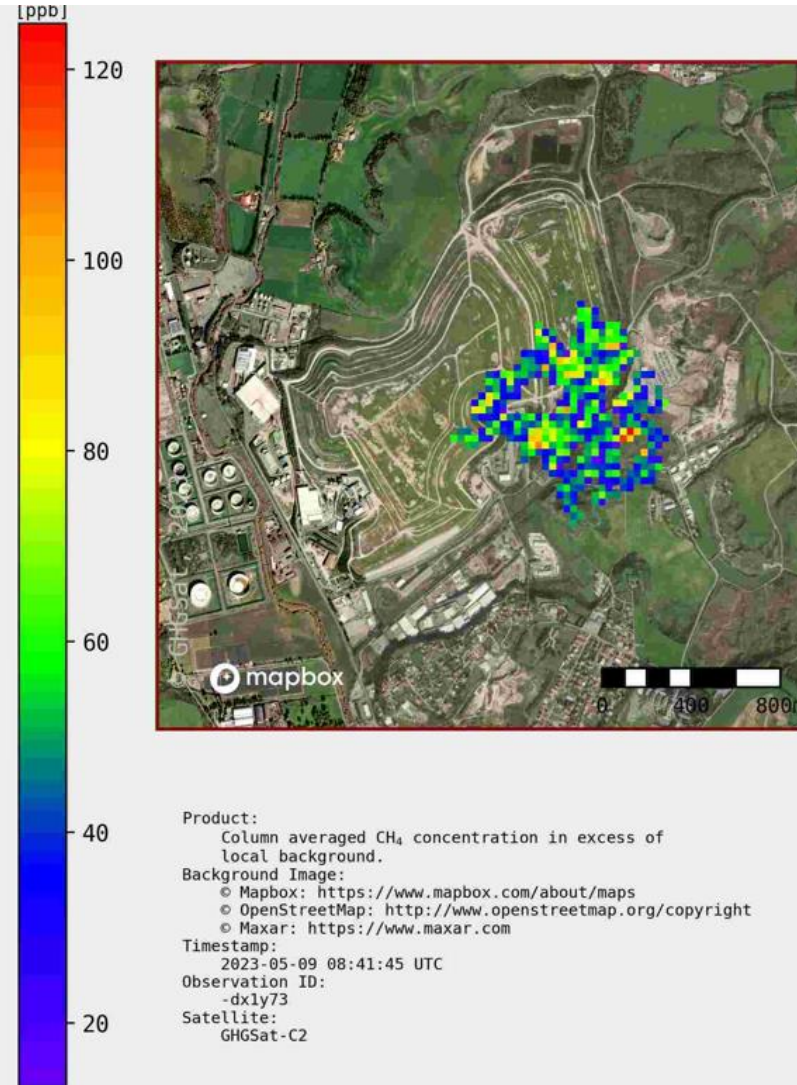
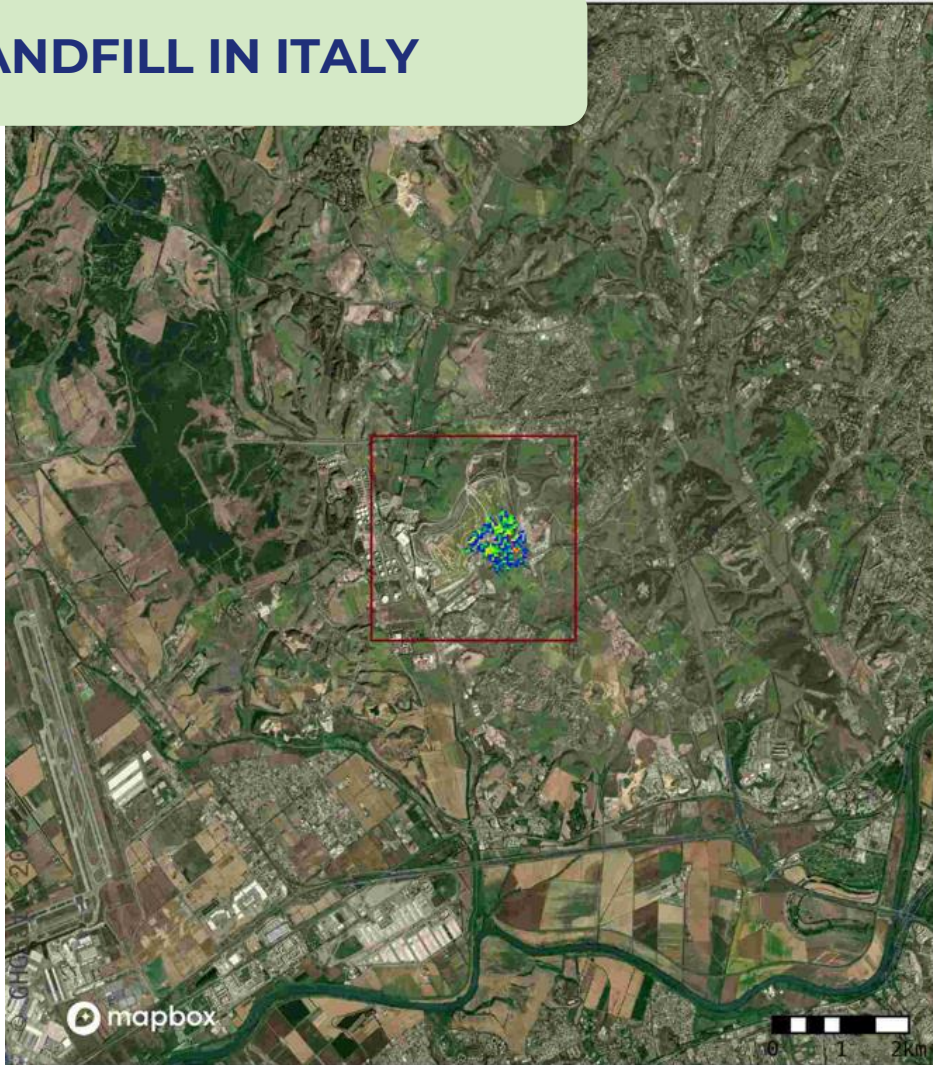




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## LANDFILL IN ITALY



Company confidential

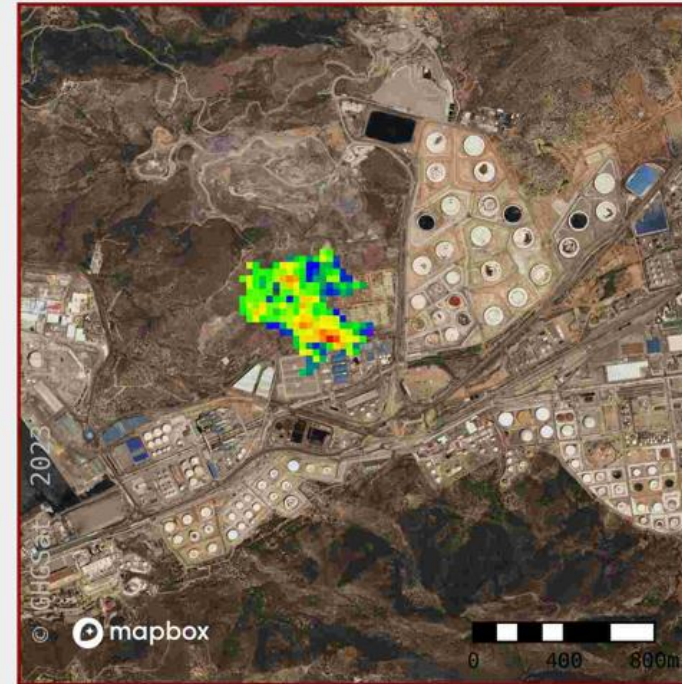
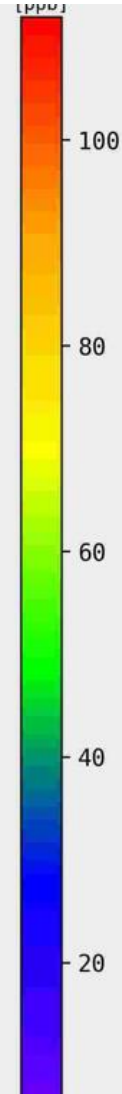
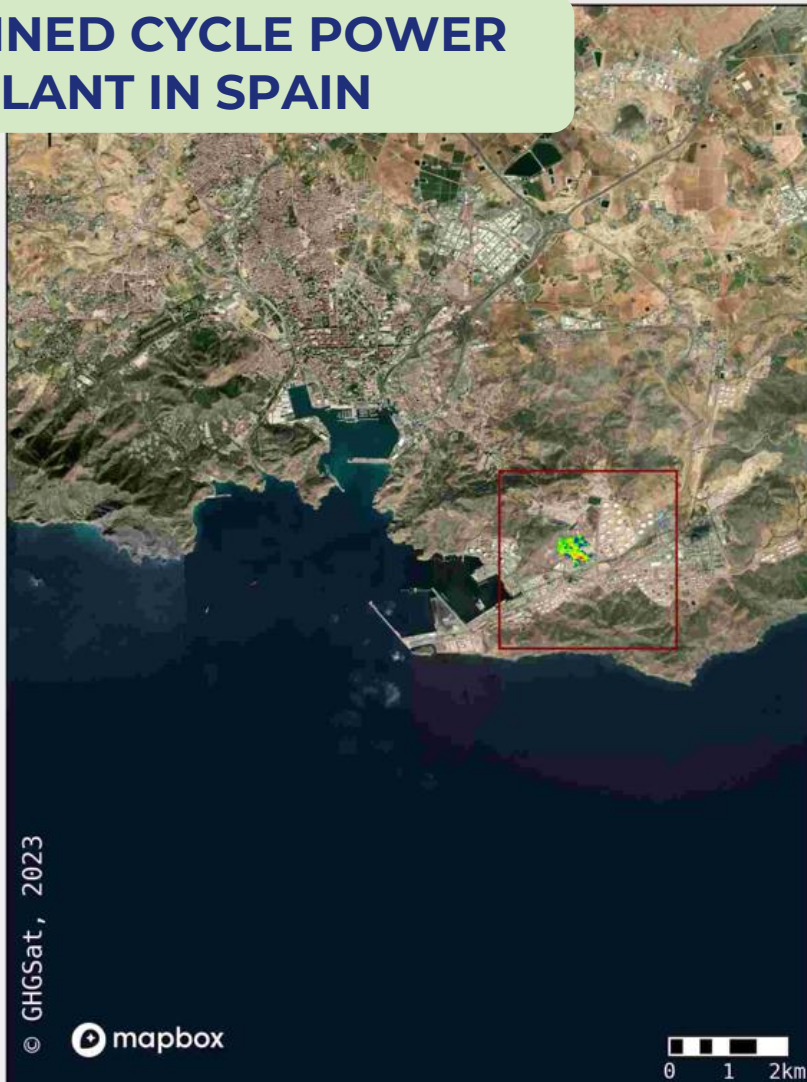




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Opportunities for emissions avoidance in our backyard

## COMBINED CYCLE POWER PLANT IN SPAIN



Product:  
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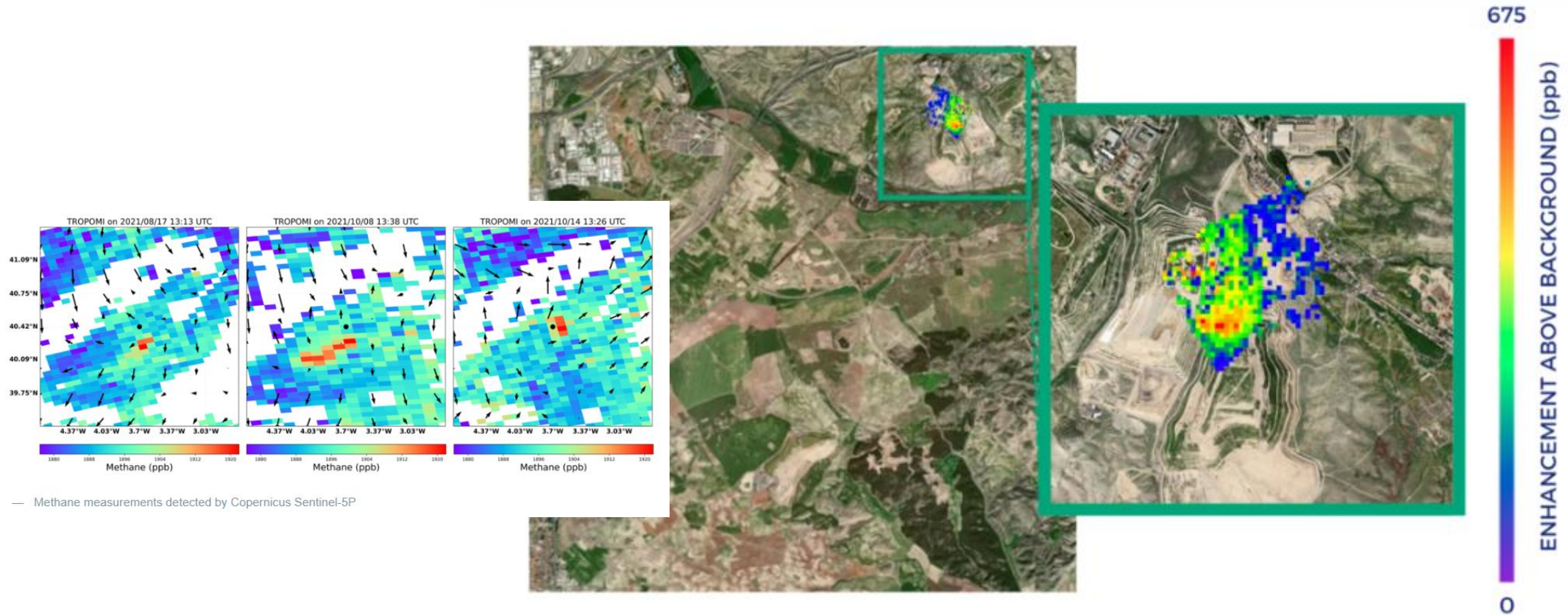


# DON'T FORGET METHANE – IN EUROPE TOO

Opportunities for emissions avoidance in our backyard

LANDFILL SPAIN

→ THE EUROPEAN SPACE AGENCY



— Methane measurements detected by Copernicus Sentinel-5P

Approved for Public Disclosure

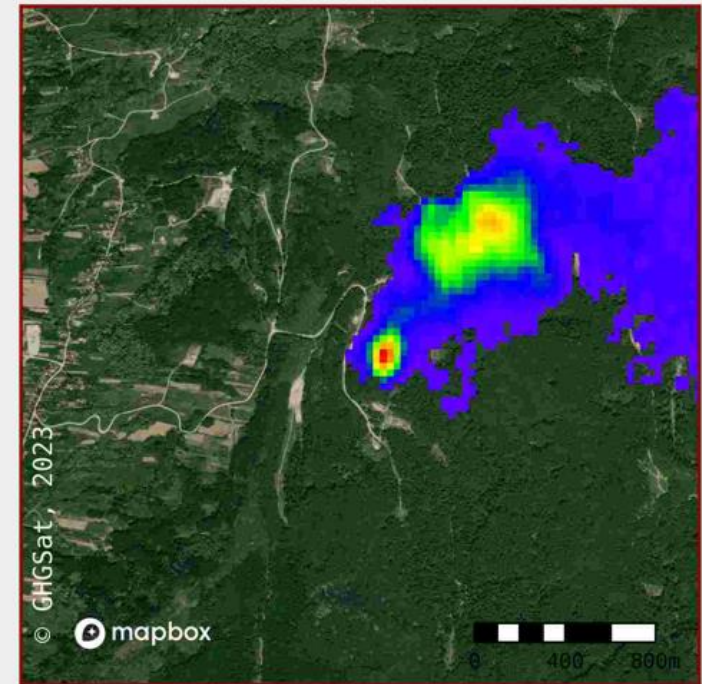
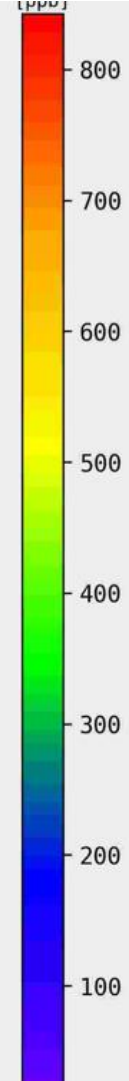
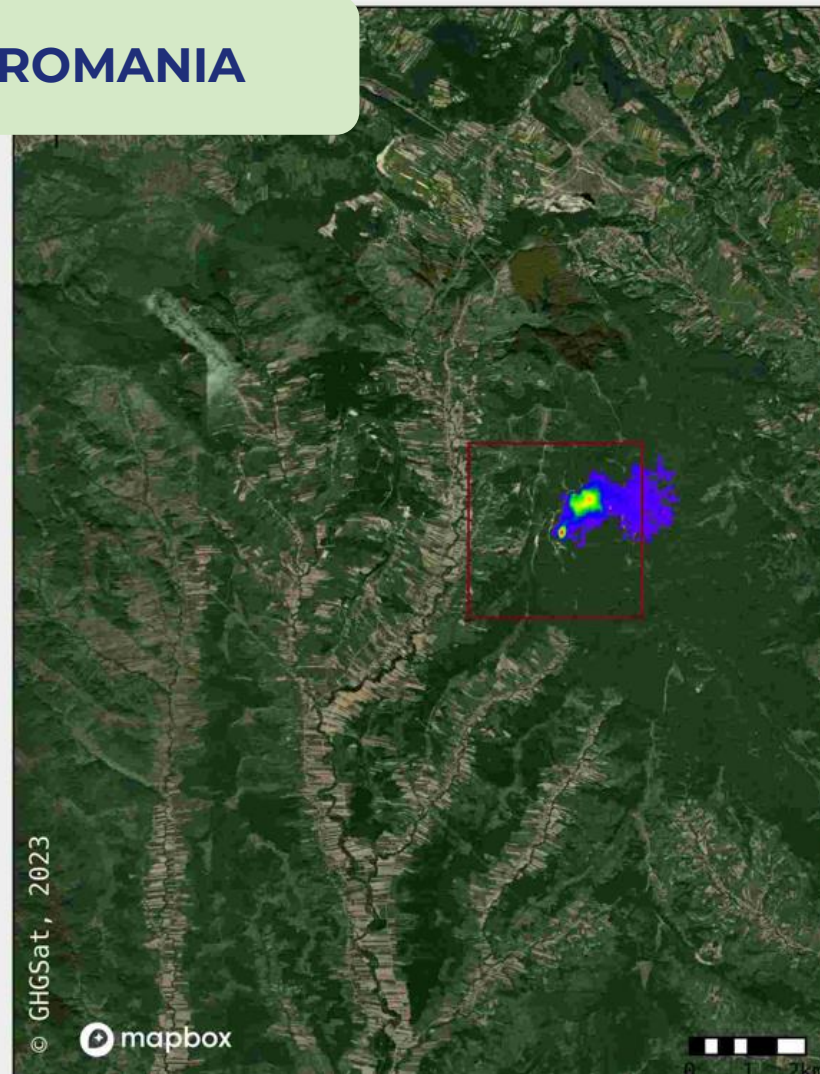
— Methane emissions detected from Madrid landfill on 20 August 2021



# DON'T FORGET METHANE – IN EUROPE

Opportunities for emissions avoidance in our backyard

## OIL & GAS IN ROMANIA



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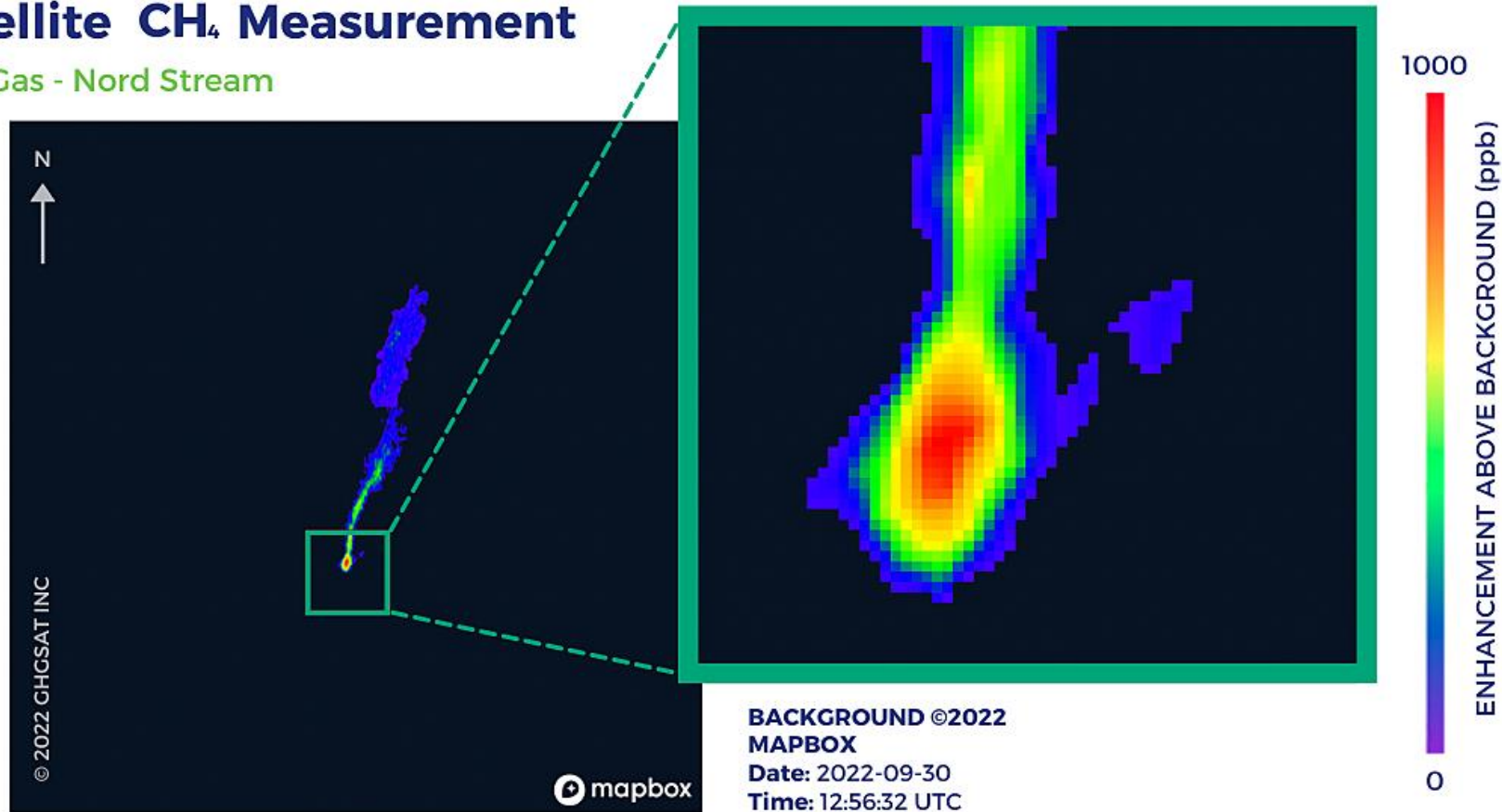
# DON'T FORGET METHANE – IN EUROPE

Opportunities for emissions avoidance in our backyard

## GAS PIPELINE – NORDSTREAM SABOTAGE

### Satellite CH<sub>4</sub> Measurement

Oil & Gas - Nord Stream



# IN SUPPORT OF THE EU METHANE STRATEGY

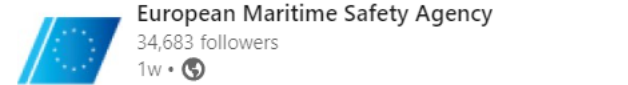
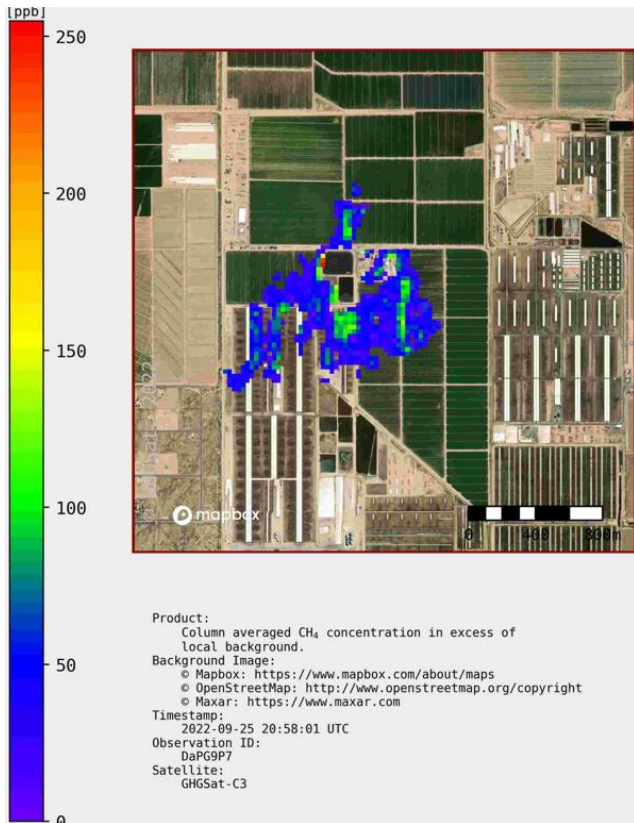
## Upcoming regulation tackling the methane emission problem

**AGRICULTURE  
EMISSIONS - CAP  
REFORM**

**EU ETS in the  
MARITIME INDUSTRY**

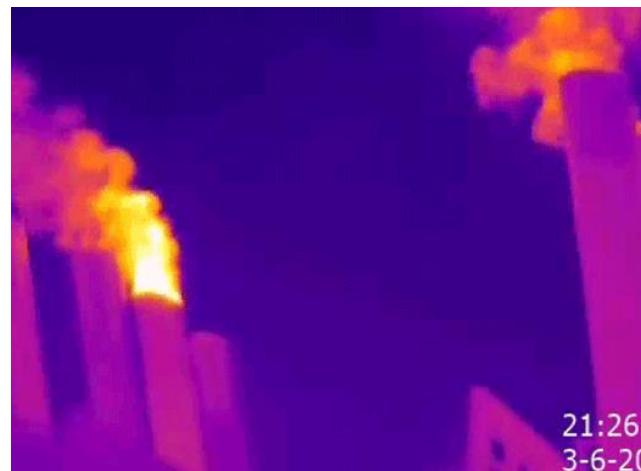
**CARBON  
BORDER  
ADJUST  
MECHANISM**

**INDUSTRIAL  
EMISSIONS  
DIRECTIVE**



Today we're holding a webinar on the extension of the EU Emission System (ETS) to maritime transport together with the European Directorate General for Climate Action.

The webinar focuses on shipping companies and verifiers and the main elements of the EU ETS and its extension to maritime transport, the relevant changes introduced to the EU MRV system.

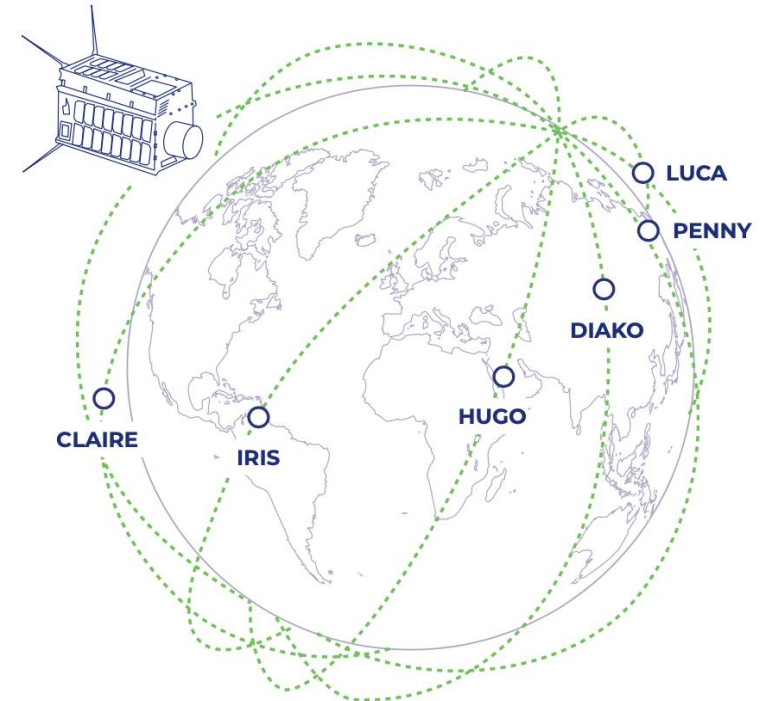


# METHANE AVOIDANCE OFFSETS



## Key Take-aways

- **Relatively easy to achieve (compared to other carbon offsets)**
- **High confidence in total volume of offsets**
- **Inherently compliant with additionality principle**
- **Most likely not reversible**
- **Scalable, applicable even at regional level**





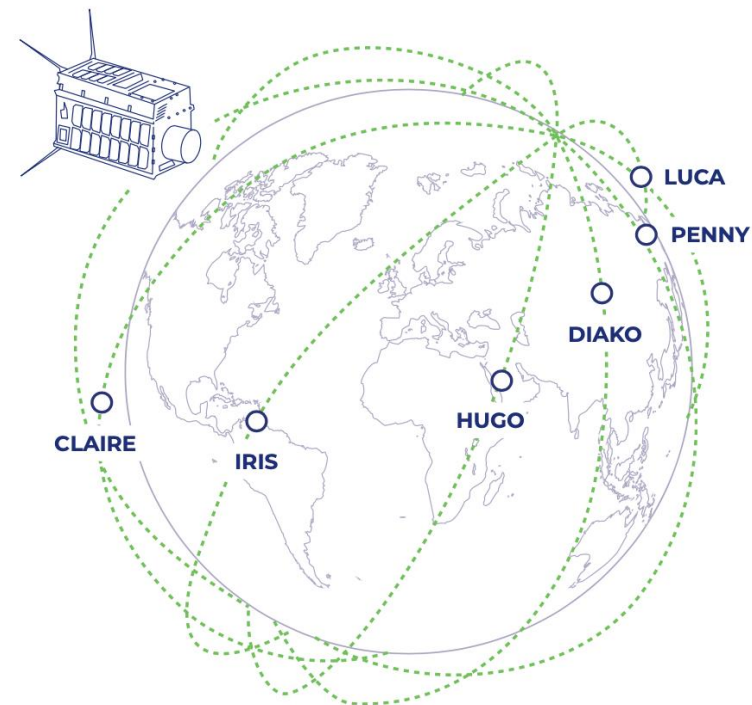


# NEW HIGH RESOLUTION CO2 MEASURING SAT

**TODAY at 20:46 CET**

**Launch of the first commercial High Resolution CO2 measuring satellite, capable of measuring at the individual facility level**

TO BE COMPLETED





# FROM PLEDGES TO ACTION

Satellites are critical for a coordinated effort on all fronts to decarbonize the world. We're ready – now.

→ [GHGSAT.COM](https://ghgsat.com)

Carles Debart – Director Business Development Europe  
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