

A satellite in space with solar panels and Earth in the background. The satellite is the central focus, with its solar panels extending outwards. The Earth is visible in the upper left, and the dark void of space with some stars is in the lower right.

KAYROS-CONFIDENTIAL

Satellite data for climate action

The Energy Forum

April 8th, 2021

The information contained in this document is confidential, privileged and only for the use of the intended recipient and may not be used, published or redistributed without the prior written consent of Kayros SAS.

01 Why Methane

02 Key technology parameters

03 Leaps in technology

04 Data uses

Economic and environmental impact of inaction



NOAA Climate.gov
@NOAAClimate

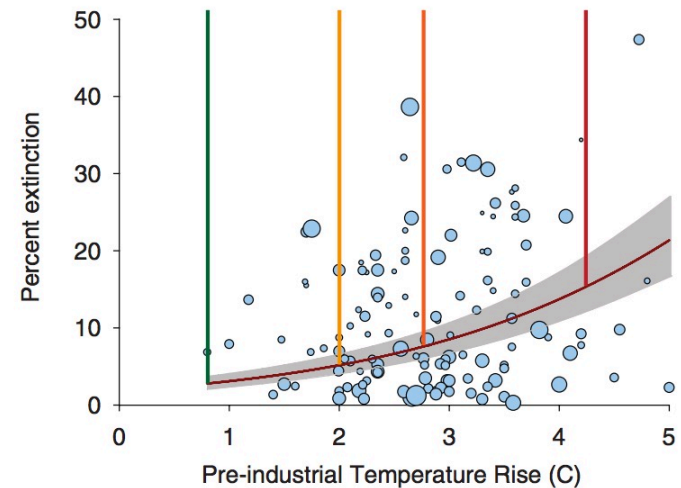
Wondering how climate change affects hurricanes? A panel of hurricane experts reviewed over 90 studies and have created an updated summary of what the science says about the human influence on these devastating storms. Find out more below.
[climate.gov/news-features/...](https://climate.gov/news-features/)

Traducir Tweet



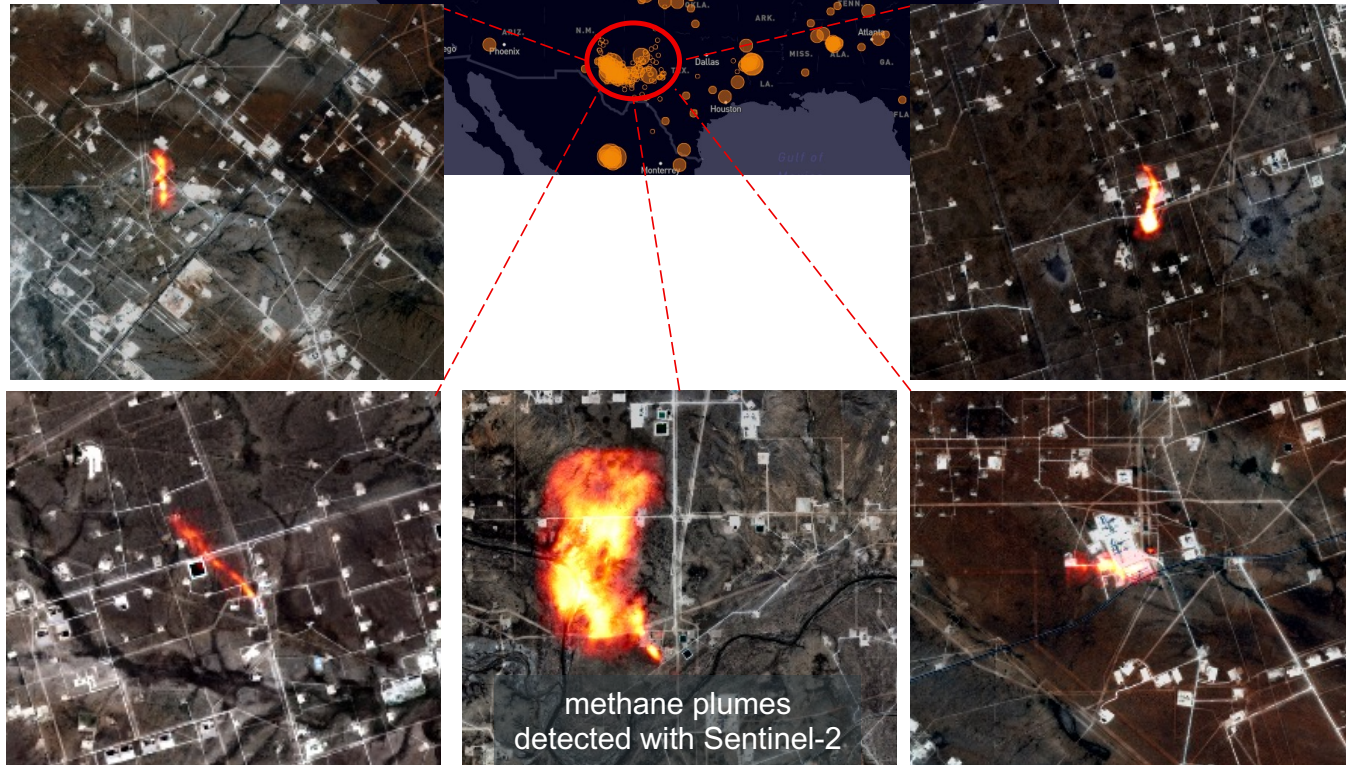
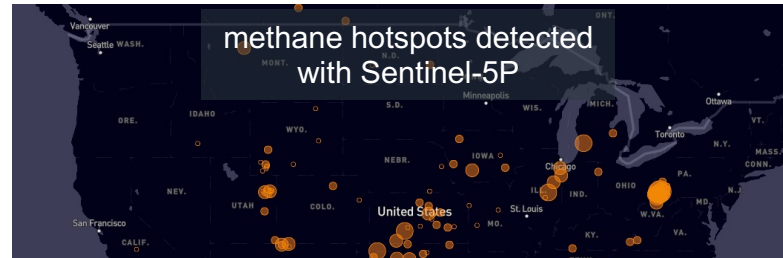
7:09 p. m. · 31 mar. 2021 · Hootsuite Inc.

Scenario	Current	Target	RCP 6.0	RCP 8.5
Predicted extinction %	2.8	5.2	7.7	15.7



Key
 • 2 species
 ● 24,480 species

Methane, long invisible, can now be monitored from space



Sources: Kayros analysis of Sentinel-5P and Sentinel-2 and Landsat-8 data.

01 Why Methane

02 Key technology parameters

03 Leaps in the technology

04 Data uses

Key parameters of methane monitoring technology

Parameter	Why this is relevant?
Spatial resolution	Ability to attribute emissions to specific facilities
Sensitivity	Ability to detect smaller methane sources
Revisit frequency	Ability to report accurately without missing events
Tasking vs. Monitoring	Ability to cover an entire supply chain, region, country

01 Why Methane

02 Key technology parameters

03 Leaps in technology

04 Data uses

Monitoring technology has matured

Sentinel - 5P

5 - 25 t/hr
threshold

5-7 km
resolution

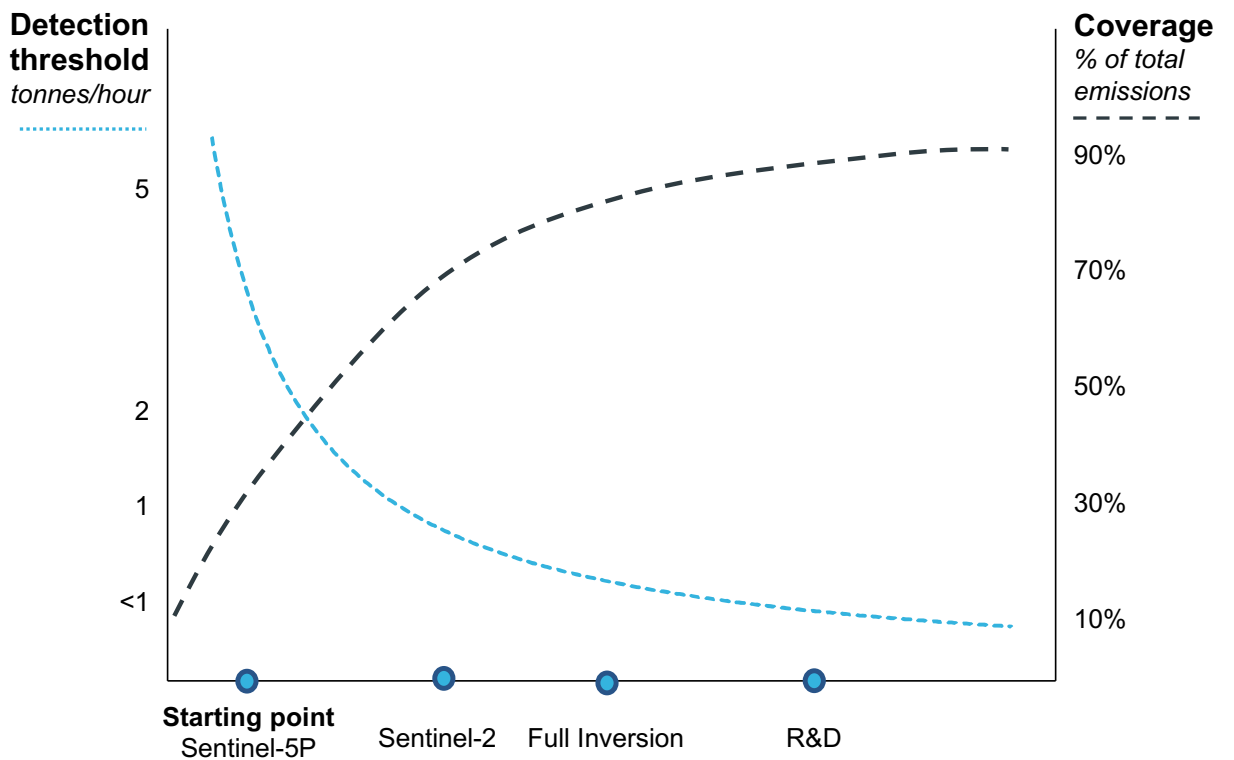
Sentinel - 2P

0.5 - 2.5 t/hr
threshold

30 m
resolution

Kayros Detection Threshold & Coverage

Global onshore basins – excluding tropical areas

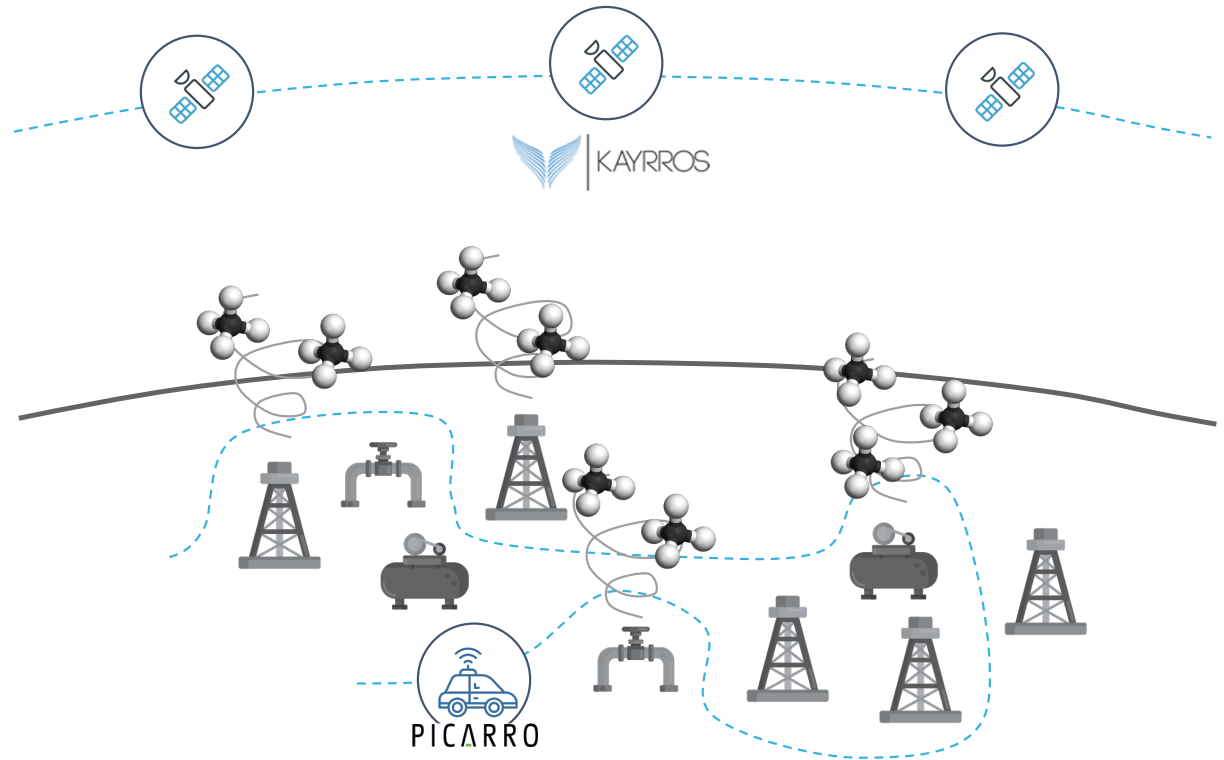


Sources: Kayros.

Monitoring satellites are the core of an integrated system

Based on the combined experience of our technology and scientific partners in the US and overseas.

Monitoring satellites provide frequency and coverage (and guide ground crews toward suspected sources)

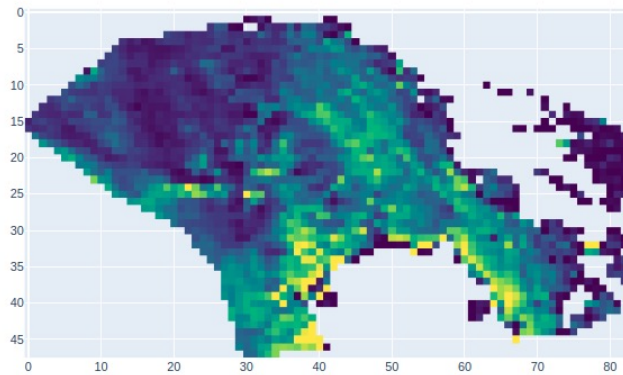


Mobile sensors provide higher resolution and sensitivity

There are 2 methods to measure emissions from space

Basin inversion

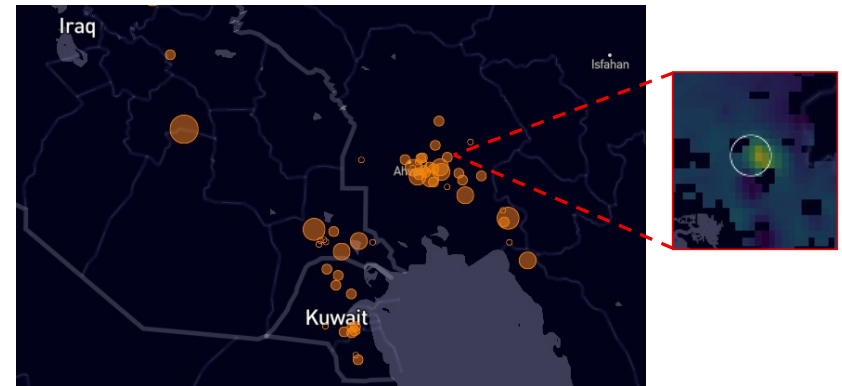
Quantify the aggregate volume of emissions across an entire oil & gas basin



Methane concentrations in Iran-Iraq-Kuwait 2019-20 average

Methane hotspots

Quantify methane emissions from large sources



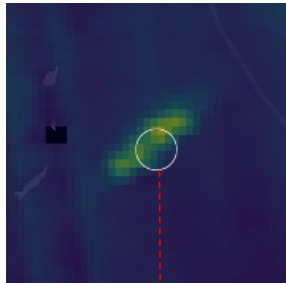
Methane hotspots in Iran-Iraq-Kuwait since January 2019

- 01 Why Methane
- 02 Key technology parameters
- 03 Leaps in the technology
- 04 Data uses**

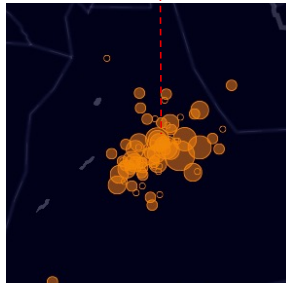
Examples of recurrent and sporadic events

Recurrent

One of many events

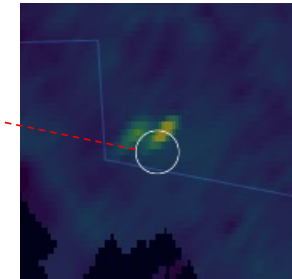


Cluster of methane events

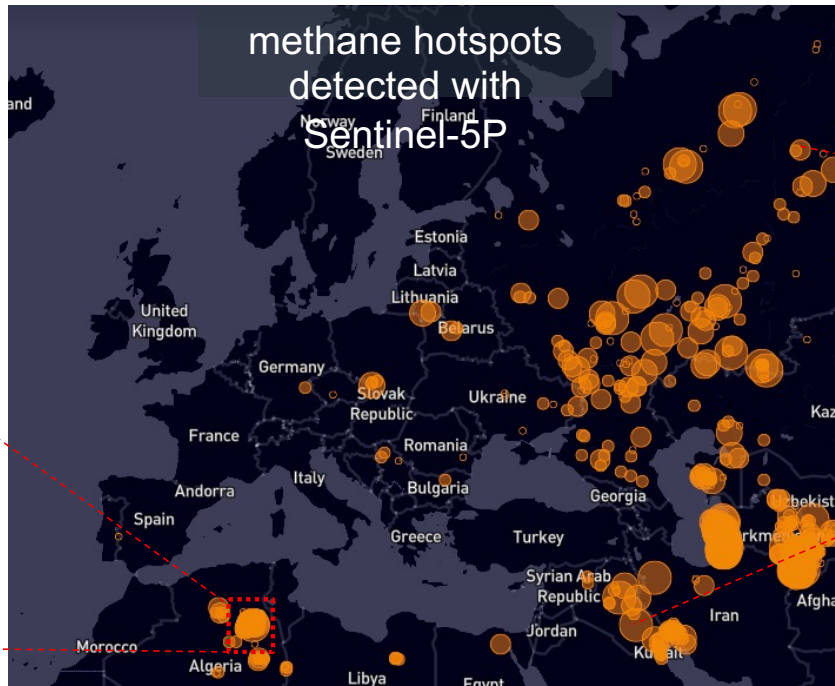
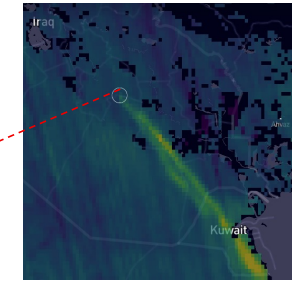


Sporadic

Vented Pipeline maintenance



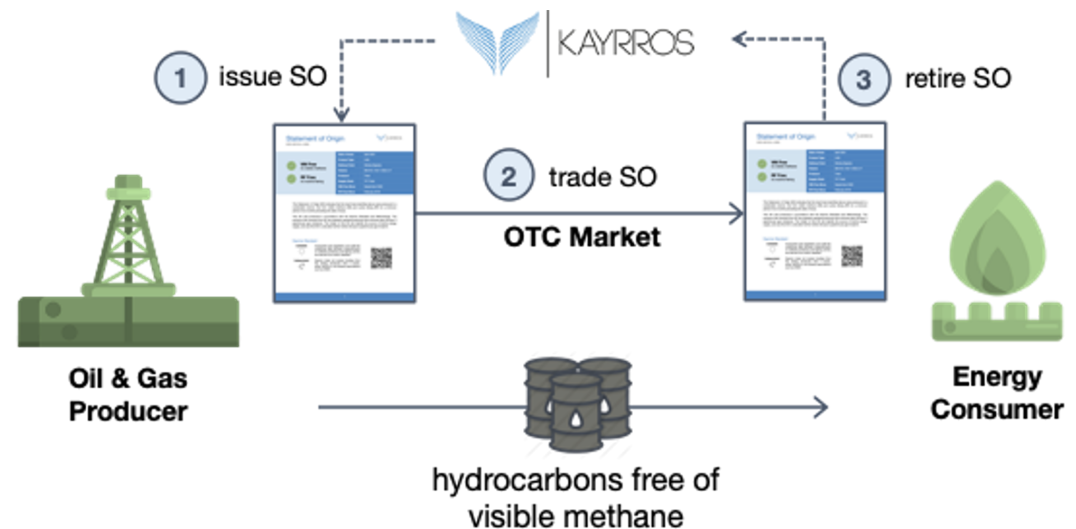
Fugitive Large plume over 400 kms long



Clean producers can achieve a price premium

Monitoring technology will lead to a voluntary market for fuels free of visible methane and routine flaring.

Moving methane from a cost centre to a profit driver



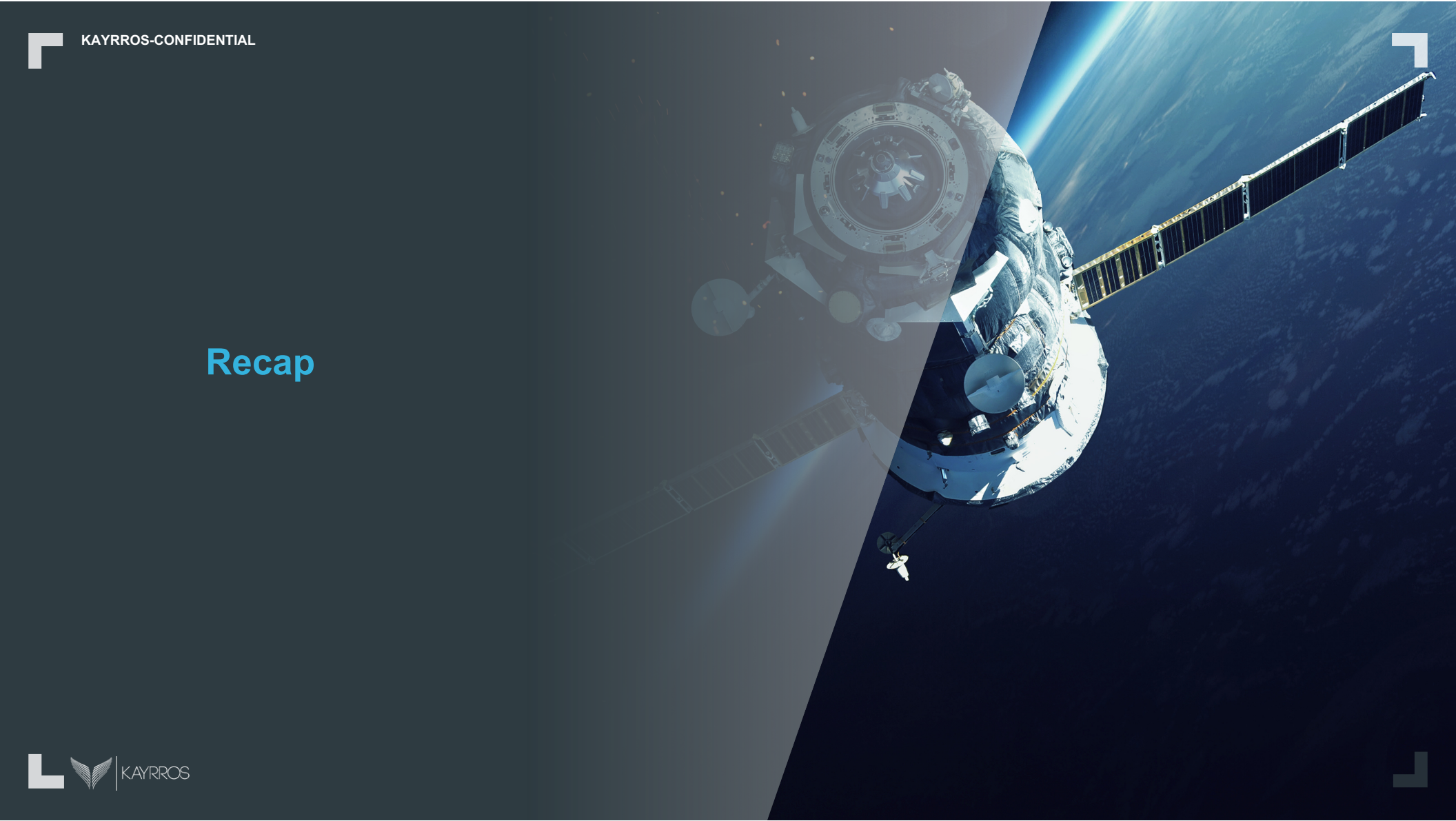
- Emulate the concept of Guarantee of Origin in power markets
- Identify and reward responsible production

Source: Kayrros



KAYRROS-CONFIDENTIAL

Recap



Recap:

Methane:

- Methane intensity values are the key numbers in climate action plans.

Existing technology:

- Existing technologies are tackling the problem right now.
- Key parameters of methane monitoring technology are: Spatial resolution, Sensitivity, Revisit frequency, Acquisition Mode

Technology progress:

- Main progress of the technology allows us: threshold detection reduction and a multilayer solution: Regional-level and company-level calculations.
- The fast progress is possible thanks to the integration of technology and collaboration of all stakeholders.

Disclaimer

This report has been provided by Kayrros SAS (“Kayrros”) pursuant to the following terms and conditions:

- Energy industry data and reports published by Kayrros (“Kayrros Reports”) and made available to paid subscribers and/or other recipients (collectively “Recipients”) are creative works of the mind achieved through algorithmic analysis of publicly available data and the information therein is proprietary to Kayrros and protected by copyright. Any copying, distribution or reproduction without the prior permission of Kayrros is strictly prohibited.
- Kayrros Reports are for informational, educational or evaluation purposes only. Any information contained in Kayrros Reports constitutes the opinion or forward-looking statement of individuals and is provided without any representation or warranty of any kind. Neither Kayrros nor its directors, officers, employees, agents or representative shall have any responsibility to you or any third party for the accuracy or completeness of any information provided in any Kayrros Report.
- Kayrros Reports are not intended to constitute investment advice. Kayrros is not an investment adviser within the meaning of Section 202(a)(11) of the U.S. Investment Advisers Act of 1940, as amended, and is not a commodity trading adviser within the meaning of Section 1(a)(12) of the U.S. Commodity Exchange Act. Kayrros does not provide investment advisory, portfolio management or financial planning services. The analyses, forecasts, metrics, samples, estimated figures, trends, figures, tables, graphs, projections and other forms of data that may be contained in Kayrros Reports do not represent or contain any recommendations to buy or sell neither any security nor any financial products and should not be relied upon as the basis for any transactions in securities.
- Kayrros and its owners, affiliates and representatives are not (1) investment advisers, commodity trading advisers, broker-dealers, financial analysts, financial planners, or banks, (2) compensated for providing investment advice, (3) registered or licensed with any regulatory body in any jurisdiction as investment advisers, commodity trading advisers, financial planners, broker-dealers, or in any other capacity (including, without limitation, the U.S. Securities & Exchange Commission (the “SEC”), the U.S. Commodity Futures Trading Commission (the “CFTC”), the U.S. Financial Regulatory Authority (“FINRA”) or their equivalents in non-U.S. jurisdictions), and do not trade in or recommend the sale or purchase of securities or commodity interests, or (4) licensed or able to provide investment advice or respond to individual requests for recommendations to purchase or sell any securities or commodity interests. No regulatory body in any jurisdiction (including the SEC, CFTC, FINRA, or a regulatory body of any state or any non-U.S. jurisdiction) has endorsed Kayrros or the contents of Kayrros Reports or the accuracy, adequacy, safety, reliability, usefulness, quality or legitimacy of any information provided to subscribers in Kayrros Reports.

Disclaimer

- Kayrros Reports are based only upon its algorithmic analysis of publicly available data and do not use or rely upon any material non-public information (“MNPI”). The insights included in Kayrros Reports do not constitute MNPI or inside information and Kayrros is not an insider. Kayrros Reports (1) may contain opinions based on third party sources that are not independently verified for accuracy or completeness, (2) may contain forward-looking statements, which are identified by words such as “expects,” “anticipates,” “believes,” or “estimates,” and similar expressions, and (3) are current as of the date of publication but may contain information or statements that are subject to change without notice. Kayrros has no obligation to, and will not, update any information contained in Kayrros Reports. Actual outcomes could differ materially from those anticipated in Kayrros Reports. As a result, the use of Kayrros Reports is at Recipients’ own risk.
- Kayrros Reports are confidential and nothing therein may be disclosed, reproduced, transmitted, distributed, sold, licensed, or altered, in whole or in part, without Kayrros’s prior written consent. Kayrros reserves the right to release to the public at any time the data and reports provided to Recipients. No rights in Kayrros Reports or any of the information contained therein are transferred to Recipients. Any misappropriation or misuse of the information in Kayrros reports will cause serious damage to Kayrros and money damages may not constitute sufficient compensation to Kayrros; consequently, Recipients agree that in the event of any misappropriation or misuse, Kayrros shall have the right to obtain injunctive relief in addition to any other legal or financial remedies to which Kayrros may be entitled.

4.5.18

Copyright © 2020, Kayrros SAS. All rights reserved.



KAYRROS

PARIS

33 Rue La Fayette
FR 75009

LONDON

1 Fore Street Avenue
London EC2Y 9DT

HOUSTON

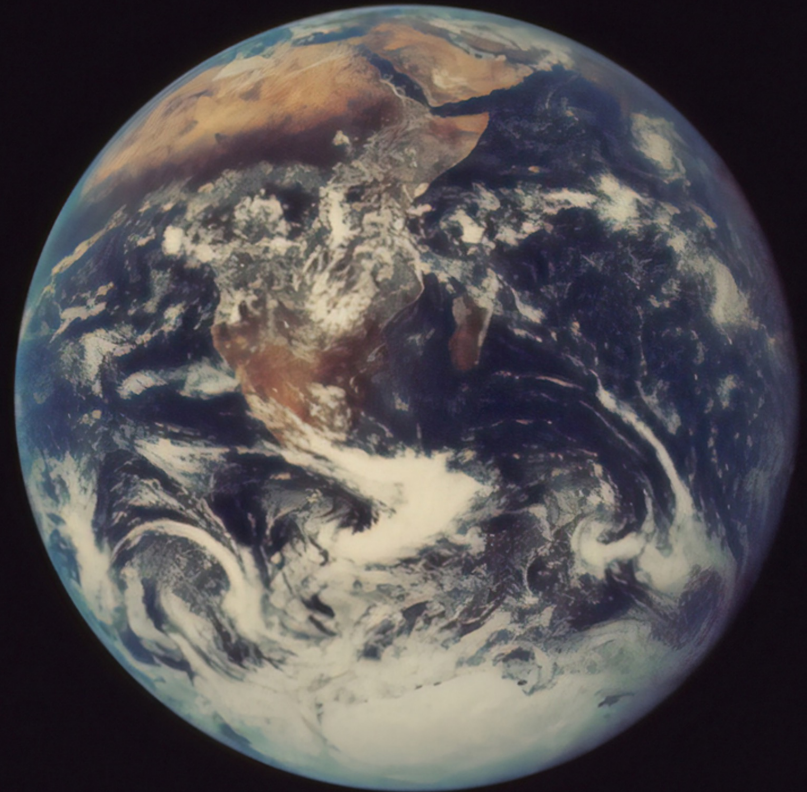
708 Main Street Houston
TX 77002

NEW YORK

300 Park Avenue
NY 10022

SINGAPORE

Level 2, 15 Beach Road
Singapore 189677



www.kayrros.com