GeoKinsella
Satellite Methane Detection & Quantification

Satellite methane screening at El Pinto Biomethane Plant

Technical report for public interest review

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Executive summary

Main finding

NASA EMIT and DLR EnMAP identified methane enhancements associated with El Pinto Biomethane Plant on eleven dates (24 February 2023, 7 October 2023, 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025, 25 May 2025 and 11 August 2025). Those repeated dated detections support a conclusion of recurring methane emissions observed on the listed dates.

High-resolution satellite evidence

NASA EMIT: Five satellite observations were examined; methane enhancement was identified on 24 February 2023, 7 October 2023 and 11 August 2025.

DLR EnMAP: Nine observations were examined; methane enhancement was identified on 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025 and 25 May 2025.

Across the examined EMIT and EnMAP record, fourteen observations yielded eleven methane detections.

Regional satellite context

No Sentinel-5P composite matching El Pinto Biomethane Plant was available. No regional emission rate is reported.

Emission-rate interpretation

EMIT and EnMAP provide dated methane detections with emission-rate estimates and reported uncertainties (24 February 2023: 5.22 t/h ± 2.45 t/h, 7 October 2023: 3.35 t/h ± 0.44 t/h, 5 July 2024: 3.34 t/h ± 1.12 t/h, 13 July 2024: 1.92 t/h ± 0.65 t/h, 27 September 2024: 2.67 t/h ± 0.95 t/h, 6 December 2024: 7.20 t/h ± 1.47 t/h, 24 March 2025: 1.08 t/h ± 0.42 t/h, 13 May 2025: 1.86 t/h ± 0.53 t/h, 21 May 2025: 2.15 t/h ± 0.39 t/h, 25 May 2025: 1.55 t/h ± 0.45 t/h and 11 August 2025: 2.04 t/h ± 0.69 t/h). A scientific quality flag recorded on an estimate is retained and is not removed to simplify the conclusion.

Recommended response

Engage the site operator about the methane detection dates (24 February 2023, 7 October 2023, 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025, 25 May 2025 and 11 August 2025). Compare those dates with operational records, assess gas capture and recovery, and consider follow-up monitoring.

Site and location

El Pinto Biomethane Plant is located at 40.26248° N, 3.63352° W. The requested investigation window is 2023-01-01 to 2026-01-01. Figure 1 shows the location of El Pinto Biomethane Plant within the surrounding region and the mapped facility boundary.

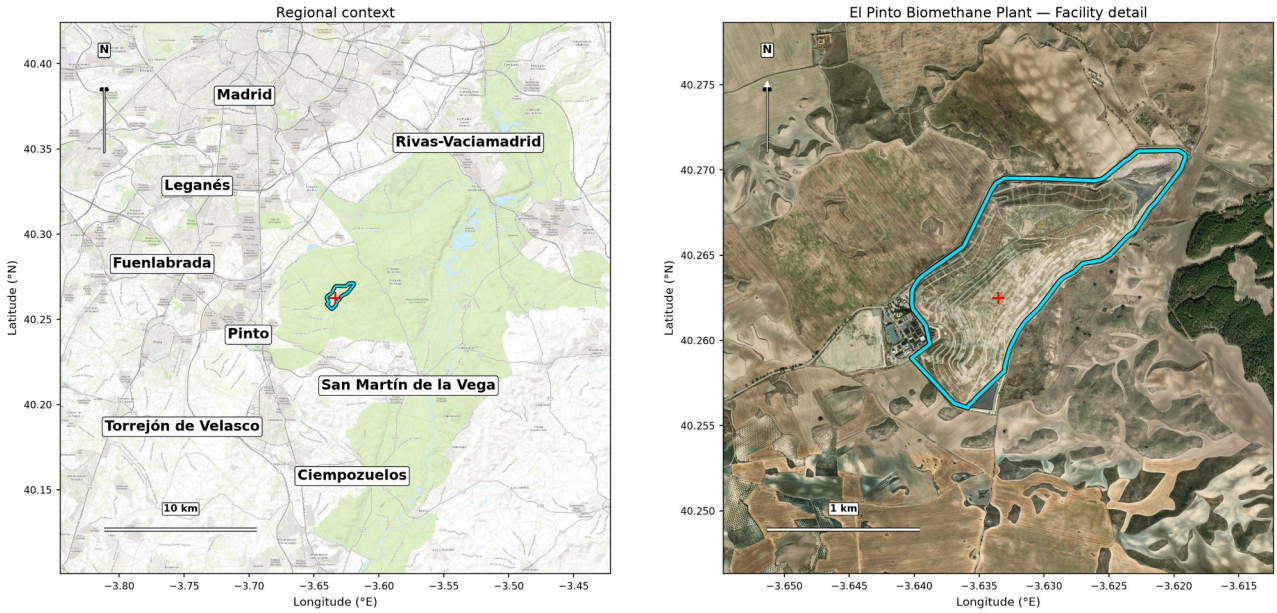


Figure 1. Regional geographic context (left) and detailed aerial view of El Pinto Biomethane Plant (right). The facility boundary is outlined.

Scientific evidence base

EMIT and EnMAP observations identify methane enhancements on eleven dates associated with the biomethane plant. Table 1 summarises the satellite evidence.

Table 1. Satellite instruments, observation records and their contributions to the El Pinto Biomethane Plant investigation.

System	Evidence used	What it contributes
NASA EMIT	5 observations	NASA imaging spectrometer observations at approximately 60 m pixel size.
DLR EnMAP	9 observations	DLR imaging spectrometer retrievals at approximately 30 m resolution.

NASA EMIT methane observations

NASA EMIT recorded methane enhancements associated with El Pinto Biomethane Plant on 24 February 2023, 7 October 2023 and 11 August 2025. Figure 2 shows the methane patterns seen from space on the selected dates. Table 2 gives the result for each examined observation, including estimated emission rates where methane was detected.

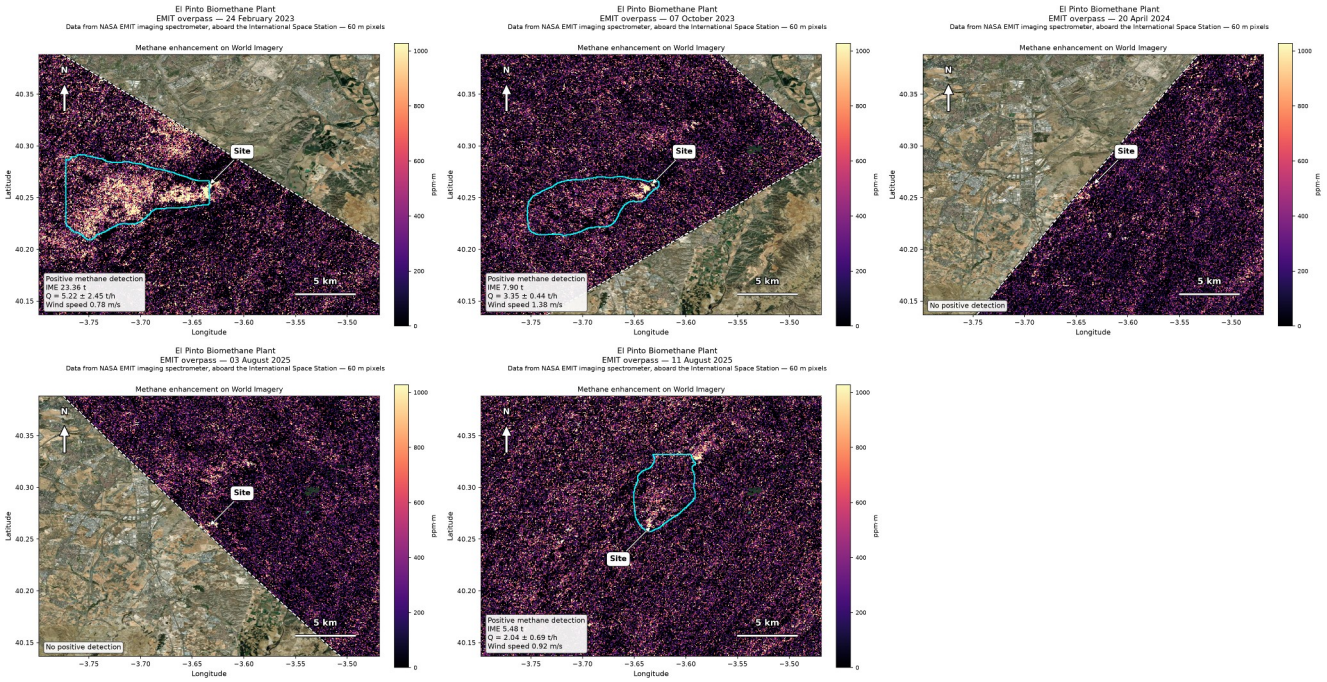


Figure 2. NASA EMIT methane observations at El Pinto Biomethane Plant. Five dated scenes show three positive methane detections and two scenes without a positive detection.

Table 2. NASA EMIT observations and emission-rate estimates (Q ± σ).

Observation time (UTC)	Methane finding	Q ± σ (kg/h)	Q ± σ (t/h)
24 February 2023 10:22:19	Detected	5216 ± 2449	5.22 ± 2.45
7 October 2023 10:50:36	Detected	3352 ± 445	3.35 ± 0.44
20 April 2024 11:38:44	No positive detection	—	—
3 August 2025 11:02:38	No positive detection	—	—
11 August 2025 14:15:39	Detected	2039 ± 686	2.04 ± 0.69

The three detected releases were estimated at 5,216 ± 2,449, 3,352 ± 445 and 2,039 ± 686 kg CH_4/h (5.22 ± 2.45, 3.35 ± 0.44 and 2.04 ± 0.69 t/h; Table 2). No observed detection does not mean that the site produced zero emissions. One of the lowest recorded detections using EMIT was by Thorpe et al. (2023), who documented methane emissions detected by EMIT as low as approximately 300 kg CH_4/h, and this should be regarded as the lowest limit in ideal conditions. EMIT Scout RECORD files flag Simple IME as wind-limited when reanalysis 10 m wind is below 2 m/s (24 February 2023, 7 October 2023 and 11 August 2025). That quality flag is retained in the results package and does not change the tabulated emission estimates.

DLR EnMAP methane observations

DLR EnMAP recorded methane enhancements associated with El Pinto Biomethane Plant on 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025 and 25 May 2025. Figure 3 shows the methane patterns seen from space on the selected dates. Table 3 gives the result for each examined observation, including estimated emission rates where methane was detected.

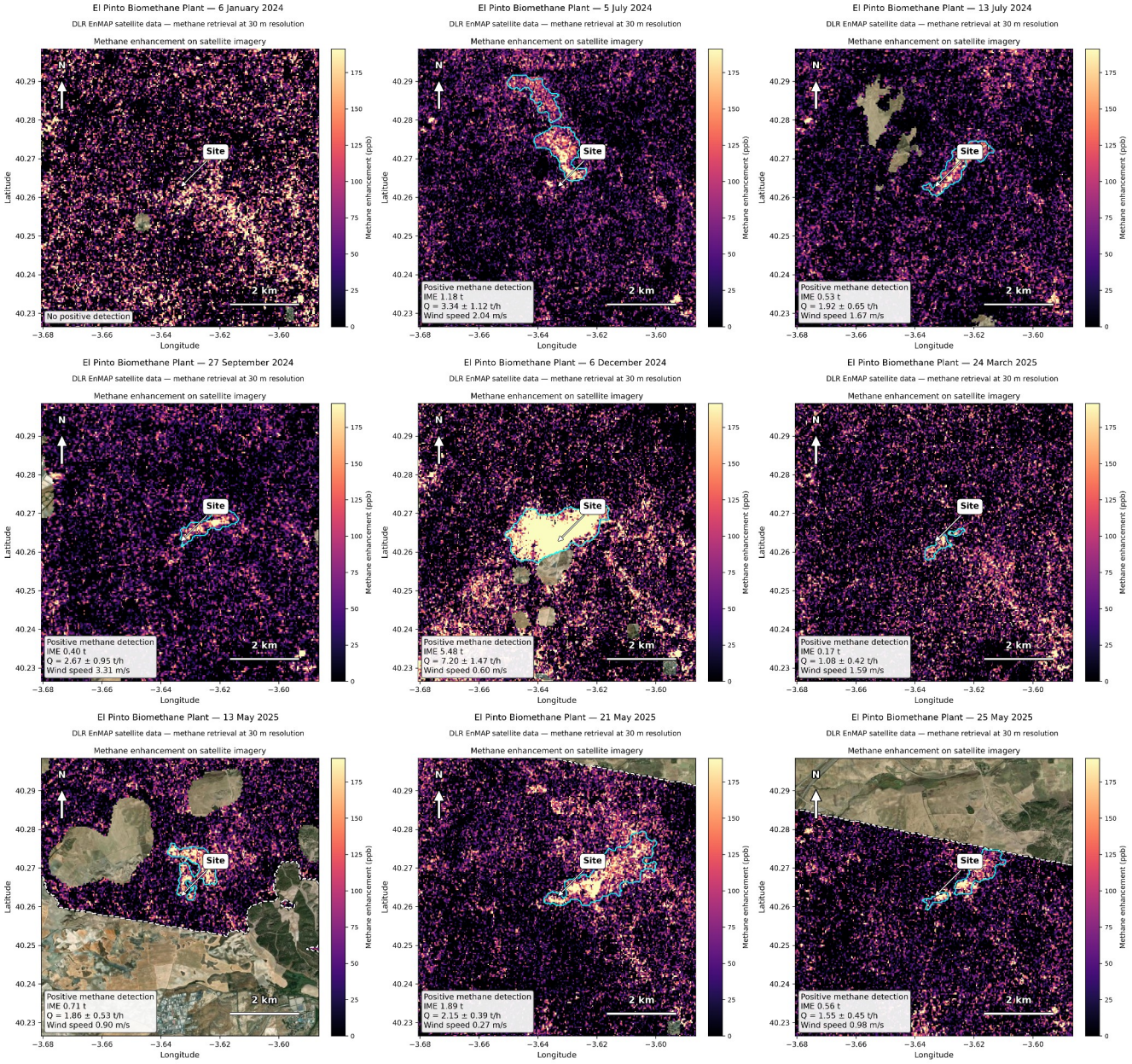


Figure 3. DLR EnMAP methane observations at El Pinto Biomethane Plant. Nine dated scenes show eight positive methane detections and one scene without a positive detection.

Table 3. DLR EnMAP observations and emission-rate estimates (Q ± σ).

Observation time (UTC)	Methane finding	Q ± σ (kg/h)	Q ± σ (t/h)
6 January 2024 11:54:29	No positive detection	—	—
5 July 2024 11:46:59	Detected	3337 ± 1117	3.34 ± 1.12
13 July 2024 11:53:59	Detected	1916 ± 648	1.92 ± 0.65
27 September 2024 11:24:47	Detected	2665 ± 952	2.67 ± 0.95

6 December 2024 11:39:09	Detected	7196 ± 1465	7.20 ± 1.47
24 March 2025 11:39:33	Detected	1082 ± 418	1.08 ± 0.42
13 May 2025 11:36:04	Detected	1856 ± 528	1.86 ± 0.53
21 May 2025 11:43:30	Detected	2152 ± 392	2.15 ± 0.39
25 May 2025 11:47:10	Detected	1555 ± 452	1.55 ± 0.45

The eight detected releases were estimated at 3,337 ± 1,117, 1,916 ± 648, 2,665 ± 952, 7,196 ± 1,465, 1,082 ± 418, 1,856 ± 528, 2,152 ± 392 and 1,555 ± 452 kg CH_4/h (3.34 ± 1.12, 1.92 ± 0.65, 2.67 ± 0.95, 7.20 ± 1.47, 1.08 ± 0.42, 1.86 ± 0.53, 2.15 ± 0.39 and 1.55 ± 0.45 t/h; Table 3). Roger, Guanter and Gorroño (2025, Table B1) document an EnMAP detection with an estimated emission rate of 600 ± 200 kg CH_4/h.

Conclusion and recommended action

Conclusion

NASA EMIT and DLR EnMAP identified methane enhancements associated with El Pinto Biomethane Plant on eleven dates (24 February 2023, 7 October 2023, 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025, 25 May 2025 and 11 August 2025). Those repeated dated detections support a conclusion of recurring methane emissions observed on the listed dates.

Recommended next steps

Operational review. Discuss the detections on 24 February 2023, 7 October 2023, 5 July 2024, 13 July 2024, 27 September 2024, 6 December 2024, 24 March 2025, 13 May 2025, 21 May 2025, 25 May 2025 and 11 August 2025 with the site operator and compare them with operational records.

Gas management. Assess capture, flaring, utilisation and any upgrading systems against the dated observations.

Follow-up monitoring. Repeat NASA EMIT, DLR EnMAP and Copernicus Sentinel-5P as new observations become available.

Authorship

Prepared by Nicholas Kinsella FRGS. Satellite evidence: NASA EMIT and DLR EnMAP.

About GeoKinsella

Satellite methane detection, remote sensing and geospatial analysis

WHO WE ARE

GeoKinsella is a specialist consultancy led by Nicholas Kinsella FRGS, focused on detecting and quantifying methane emissions through satellite Earth observation and geospatial analysis.

WHAT WE PROVIDE

Satellite methane screening, source assessment and emissions quantification using Sentinel-5P, NASA EMIT and DLR EnMAP, supported by geospatial analysis and scientific reporting.

GeoKinsella.net

References

GeoKinsella (2026) 'Satellite methane detection and quantification'. Available at: GeoKinsella.net (Accessed: 29 October 2026).

Roger, J., Guanter, L. and Gorroño, J. (2025) 'Assessing the detection of methane plumes in offshore areas using high-resolution imaging spectrometers', Atmospheric Measurement Techniques, 18, pp. 5545–5567. doi:10.5194/amt-18-5545-2025.

Thorpe, A.K. et al. (2023) 'Attribution of individual methane and carbon dioxide emission sources using EMIT observations from space', Science Advances, 9(46), eadh2391. doi:10.1126/sciadv.adh2391.