

SATELLITE DATA TO METHANE ACTION: REDUCING EMISSIONS IN AZERBAIJAN



Through the Methane Alert and Response System (MARS), UNEP's International Methane Emissions Observatory has verified concrete methane action in Azerbaijan.



On July 5 and 12, and August 8, 2024, UNEP's International Methane Emissions Observatory (IMEO) detected several large methane emission sources in the Neft Daşları offshore complex in Azerbaijan using data from the Italian Space Agency's PRISMA and the German Aerospace Center's Environmental Mapping and Analysis Program (EnMAP).

MARS, managed by UNEP's IMEO, uses satellites to identify major sources of methane emissions like these and enable targeted action to resolve them. Immediately following the detections, IMEO sent a MARS notification with information on the emissions to the government-nominated focal point and to the operator, Socar, as a member of UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0).

Within a few weeks, Socar informed UNEP's IMEO that the emissions originated from venting at the offshore platforms. Socar additionally informed UNEP's IMEO that the installation of a low-pressure gas line had been completed, enabling the company to export additional associated gas that had previously been vented at two of the detected locations.

MARS is the first global satellite detection and notification system providing actionable data on major methane emissions around the world.



The two sources were thought to emit, on average, approximately 4.2 and 4.8 tonnes of methane per hour (based on the six satellite observations on 5 and 12 July, and 8 August 2024). Every hour, the combined near-term climate impact of both emission events was equivalent to the annual emissions of about 157 passenger vehicles.

On 30 September 2024, UNEP's IMEO confirmed through satellite images that no further emissions were seen at these two offshore production platforms. IMEO will continue to monitor the location in case subsequent emissions are detected.

While the operator noted that its planned mitigation process was under way prior to the MARS notifications, through MARS, UNEP's IMEO was able to demonstrate the success of the mitigation action and confirm that emissions are no longer detected from a previously persistently emitting facility.

Location of Methane Emissions Detected in Offshore Facilities in Azerbaijan, With and Without Plumes



Figure 1: Satellite images pre-MARS notification of major methane emission events, detected on July 5 and 12, and August 8, 2024, respectively, from ASI's PRISMA and DLR's EnMAP. Post-MARS notification satellite image from ASI's PRISMA of 30 September 2024, showing no plumes at these locations.

MARS HAS FOUR COMPONENTS



1 METHANE Detect and Attribute

UNEP's IMEO works with global mapping satellites to identify very large methane plumes and conducts further analysis with high-resolution satellites and datasets to identify the source of emissions. After detecting a plume, IMEO also investigates archival satellite data to provide context about how long and at what rate emissions have been occurring. Additionally, IMEO requests further satellite images from space agency partners to confirm details and status of the emissions.

On 5 and 12 July 2024, and 8 August 2024, through MARS, UNEP's IMEO detected large methane emissions in the Neft Daşları offshore complex in Azerbaijan via the Italian Space Agency's PRecursores IperSpettrale della Missione Applicativa (PRISMA) and the German Aerospace Center's Environmental Mapping and Analysis Program (EnMAP).



2 ALERT Notify and Engage Stakeholders

UNEP's IMEO works to notify governments and companies of large emissions events happening across their jurisdictions or operations. It continues this engagement as more information becomes available.

On 9 and 19 July 2024, and 23 August 2024, UNEP's IMEO sent MARS notifications with information on the detected emissions to the Ministry of Ecology and Natural Resources of the Republic of Azerbaijan and the operator, Socar, as a member of UNEP's Oil and Gas Methane Partnership 2.0 (OGMP 2.0). The notification included information on emission events observed from space, including detailed information on their location, size and potential sources. According to the multiple satellite observations, the two sources were thought to emit, on average, approximately 4.2 and 4.8 tonnes of methane per hour at the time of notifications.



3 RESPONSE Stakeholders Take Abatement Action

It is up to notified stakeholders to determine how best to respond to the notified emissions and share their actions with UNEP's IMEO to demonstrate verifiable climate action.

A few weeks later, Socar informed UNEP's IMEO that the large emissions originated from venting at the offshore platforms. The company confirmed that a low-pressure gas line had been installed, enabling the company to export additional associated gas that had previously been vented at two of the detected locations.



4 SYSTEM Track, Learn, Collaborate, Improve

UNEP's IMEO continues to monitor notified locations for future emissions as mitigation efforts proceed. Data and analyses are made public 30 days post detection on the MARS data portal.

Since the initial notification, UNEP's IMEO has continued to monitor the site and confirmed on 30 September 2024, via subsequent satellite imagery from ASI's PRISMA for any further emissions.

The combined hourly climate impact of both emission events was equivalent to the annual emissions of about 157 passenger vehicles driven. IMEO is continuing its engagement with the government of Azerbaijan and industry actors to raise awareness of MARS, build capacity for methane action, and to address new emission events as they arise.



In implementing MARS, UNEP's IMEO collaborates with various institutional partners, including the World Bank, International Energy Agency, the Climate and Clean Air Coalition, Universitat Politècnica de València, the Netherlands Institute for Space Research and the Committee on Earth Observation Satellites.

Based on satellite data used by MARS, it is not possible to confirm the presence of minimal methane emissions at a given location. Rather, this data can confirm the absence of emissions at levels higher than a given satellite's detection limit, which varies based on the technology, ground conditions and the weather.