

Key Messages

AI IS UNLOCKING REAL-WORLD METHANE REDUCTIONS

- ▶ UNEP's Methane Alert and Response System (MARS) has become a global operational methane monitoring system, using AI to accelerate methane detection and response.
- ▶ Since becoming fully operational in 2024, it has supported methane identification and monitoring resulting in over 40 real-world methane mitigation actions.
 - Most of these cases originated from AI-assisted detection workflows, with AI models flagging approximately 80–85% of confirmed methane detections before expert review.
- ▶ These mitigated sources are estimated to have emitted 1.2 million tonnes of methane before repairs or corrective action were taken.
 - The climate impact is comparable to the annual emissions of nearly 24 million gasoline-powered passenger cars.

AI IS HELPING TURN THE SECRETARY-GENERAL'S METHANE CALL INTO ACTION

- ▶ Delivering on the Secretary-General's Call to Action on Methane will require turning vast amounts of methane data into targeted action and AI is making that more efficient.
- ▶ The Secretary-General has called on countries to respond to 80% of methane alerts received via MARS.
- ▶ AI accelerates UNEP efforts to identify major emission events globally and notify governments and companies.
- ▶ The combination of AI, satellites and international cooperation helps close the gap between methane detection and methane reduction.

AI GIVES UN METHANE OBSERVERS A 15-FOLD BOOST

- ▶ AI enables UNEP's MARS analysts to process 12-15 times more data while maintaining scientific rigor.
- ▶ More than 1.3 million satellite observations have been analysed through the system since its pilot in 2023.

Spotlighting Opportunity: How Artificial Intelligence is Accelerating Methane Action

- ▶ AI acts as a first filter, allowing experts to focus their attention on the most likely methane emission events.
 - Human analysts continue to verify all detections through a rigorous review process.
- ▶ The result is a scalable model for environmental monitoring at a time when satellite data volumes are growing rapidly.

UNEP IS PIONEERING THE USE OF AI TO FIND AND REDUCE METHANE EMISSIONS AT GLOBAL SCALE

- ▶ UNEP has developed the world's first AI-enhanced methane detection and notification system operating at global scale.
- ▶ UNEP has developed dedicated AI models for both multispectral and hyperspectral satellite data, yielding actionable insights at the facility-level.
- ▶ UNEP's MARS integrates information from more than 30 satellite instruments.
- ▶ The system combines AI models with expert review to detect methane emissions across countries and sectors.
- ▶ The system transforms a patchwork of separate monitoring efforts into a global transparency mechanism.

UNEP IS DEMONSTRATING A RESPONSIBLE MODEL FOR AI IN CLIMATE ACTION

- ▶ AI can support climate solutions while keeping sustainability, transparency and human oversight at the centre.
- ▶ UNEP designed its methane AI tools to be lightweight and energy efficient, requiring only modest computing resources.
- ▶ Human experts remain in the loop and verify AI outputs before notifications are issued.
- ▶ UNEP is making key datasets and code openly available to accelerate innovation and equitable access.
- ▶ UNEP's experience offers a practical model for how AI can be deployed responsibly to address global environmental challenges