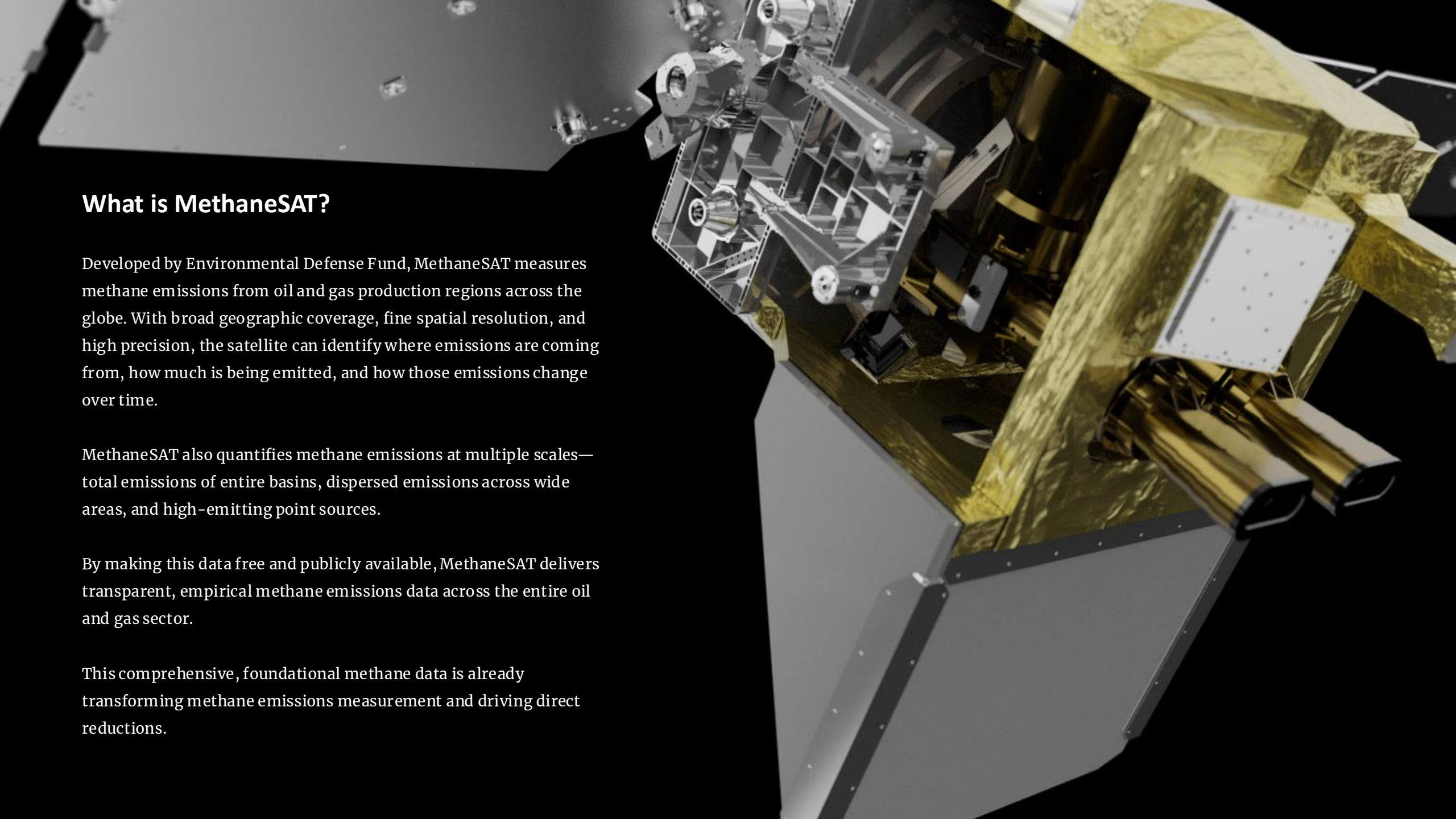
MethaneSAT™

Frequently Asked Questions



What is MethaneSAT?

Developed by Environmental Defense Fund, MethaneSAT measures methane emissions from oil and gas production regions across the globe. With broad geographic coverage, fine spatial resolution, and high precision, the satellite can identify where emissions are coming from, how much is being emitted, and how those emissions change over time.

MethaneSAT also quantifies methane emissions at multiple scales—total emissions of entire basins, dispersed emissions across wide areas, and high-emitting point sources.

By making this data free and publicly available, MethaneSAT delivers transparent, empirical methane emissions data across the entire oil and gas sector.

This comprehensive, foundational methane data is already transforming methane emissions measurement and driving direct reductions.

How does MethaneSAT combat global warming?

There are many use cases for MethaneSAT's data:

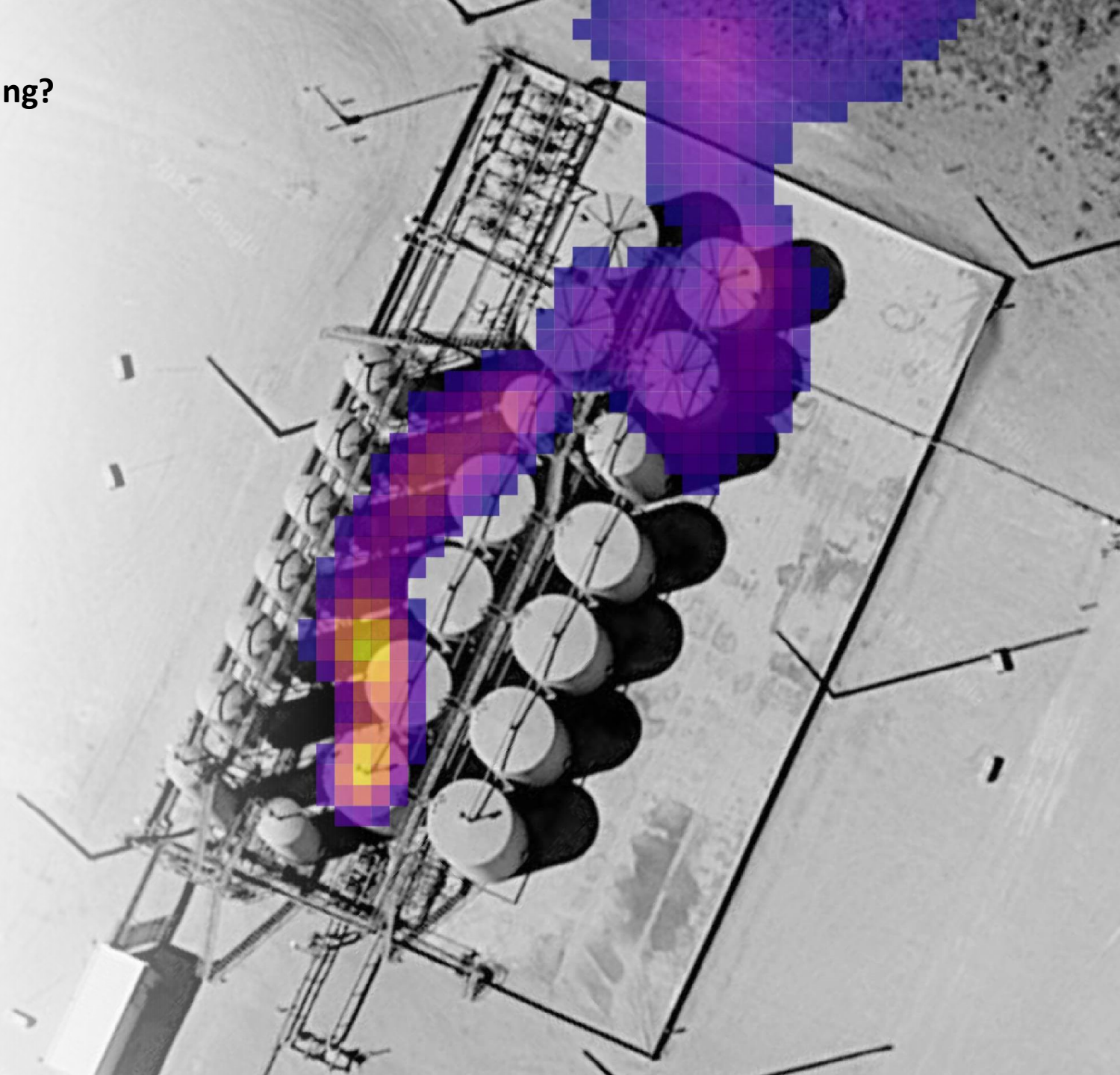
Oil and gas companies
- Accurately quantify emissions
- Improve operational performance
- Reduce emissions

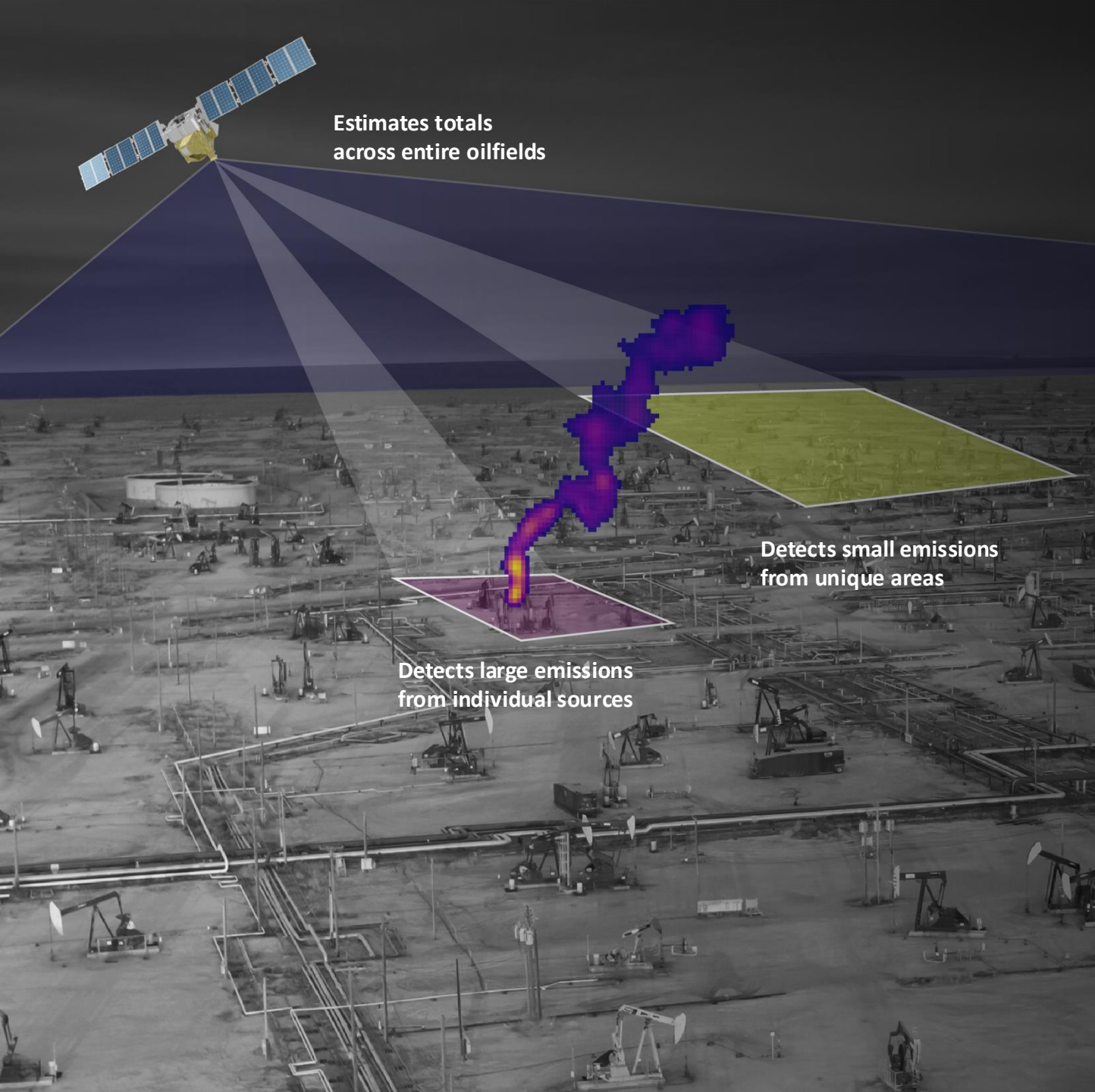
Governments and environmental agencies
- Track emission reduction efforts
- Enforce and improve regulations

Natural gas consumers
- Compare producers' methane performance
- Source cleaner gas

Financial institutions
- Understand methane performance of portfolio companies
- Prioritize climate-friendly investments

Scientists/researchers
- Advance scientific understanding of methane
- Incorporate into other types of research





What data is collected?

MethaneSAT is able to detect methane emissions from multiple sectors, including from oil and gas, coal mines, landfills and agriculture. However, the mission primarily focuses on measuring and spurring reductions of methane emissions from the oil and gas sector. Data from agriculture will also be collected to improve scientific confidence in our ability to measure and reduce methane emissions from the agricultural sector.

MethaneSAT tracks methane emissions at three different scales, each serving a unique purpose that can lead to climate solutions.

- It measures methane emissions from high-emitting point sources (at rates from about 500 kg/hour)
- It measures aggregate methane emissions from smaller, dispersed sources (at rates from about 10 kg/hour/km2). These emissions, when viewed as a whole, can make up the majority of methane emissions from an oil and gas basin
- It measures methane levels from entire regions/countries/oilfields.

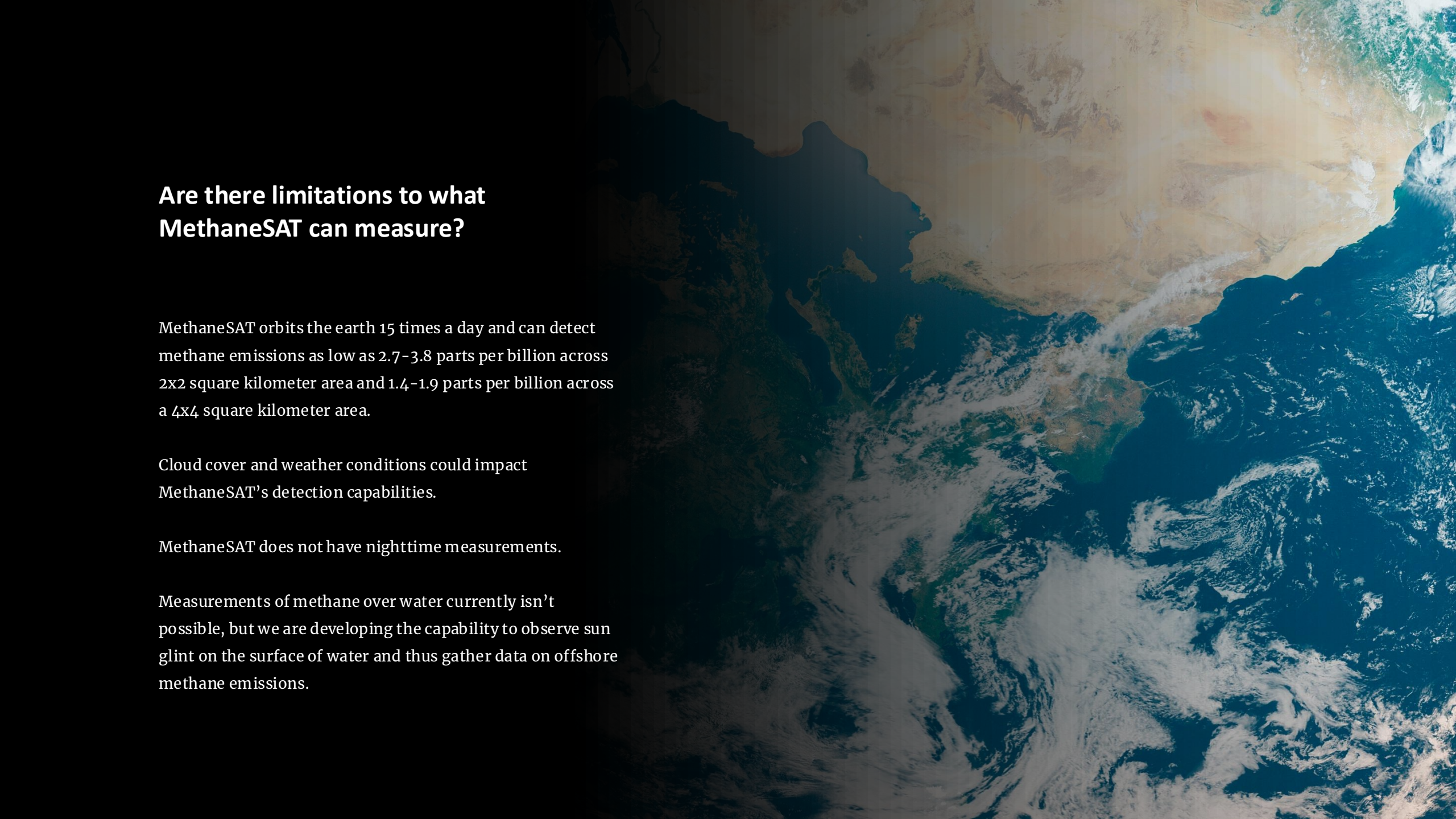
Are there limitations to what MethaneSAT can measure?

MethaneSAT orbits the earth 15 times a day and can detect methane emissions as low as 2.7-3.8 parts per billion across 2x2 square kilometer area and 1.4-1.9 parts per billion across a 4x4 square kilometer area.

Cloud cover and weather conditions could impact MethaneSAT's detection capabilities.

MethaneSAT does not have nighttime measurements.

Measurements of methane over water currently isn't possible, but we are developing the capability to observe sun glint on the surface of water and thus gather data on offshore methane emissions.



How can I access MethaneSAT data?

Once collected, data will be processed and available within a few weeks of collection. MethaneSAT data can be accessed the following ways:

Read data insights on the MethaneSAT website

MethaneSAT data stories, highlights, and analysis are publicly available. These are published periodically and can include curated insights such as comparisons of methane emission loss rates between O&G basins.

Explore and interact with regularly refreshed data on MethaneSAT's web portal

Data are viewable on MethaneSAT's online portal, which is easily accessible and free for everyone. Users can see where emissions are coming from, how much is being emitted, and how they're changing over time. The emissions data are be regularly refreshed every few weeks and are overlaid with a layer of O&G infrastructure data, such as wells, pipelines, and owners of the assets.

Analyze data on Google Earth Engine (Geospatial analysis platform)

MethaneSAT data are available for advanced analysis on GEE, a Google-owned platform that enables users to visualize and analyze geospatial data. The platform allows the most flexibility and power for users that need it, such as enabling easy layering and analysis of MethaneSAT data and other datasets. Commercial entities need a paid subscription to use GEE (pricing determined by Google) and a license to access MethaneSAT data*. Researchers, nonprofits, academic institutions, and other noncommercial entities can access the GEE platform and data for free. GEE users who have a MethaneSAT license can also ingest the data onto their own cloud platforms via the GEE API. Google egress fees apply. To get access, go to Google Earth Engine's MethaneSAT page and fill out the Request Form under "Terms of Use."

Download data from Google Cloud Platform

Users who prefer not to access the data on Google Earth Engine or ingest via GEE API have the option to download the data directly from Google Cloud Platform. Google egress fees apply. To get access, go to Google Earth Engine's MethaneSAT page and fill out the Request Form under "Terms of Use."

*Information about licensing and pricing for commercial entities will be available later. Currently, all data are free, including for commercial use.

How are emissions be attributed?

MethaneSAT scans regions that produce 80% of the world's oil and gas.

Using a comprehensive database of oil and gas infrastructure, users of MethaneSAT data may in many cases be able to identify operators with assets in methane hotspots.

Who developed MethaneSAT?

MethaneSAT is the only satellite to be developed by a nonprofit environmental organization and includes a global team of experts in remote sensing, astrophysics, methane detection and data.

The partners that helped build, launch and manage MethaneSAT operations includes:

- BAE Systems
- Blue Canyon Technologies
- Environmental Defense Fund
- Google
- Harvard School of Engineering and Applied Sciences
- Harvard Smithsonian Center for Astrophysics
- IO Aerospace
- New Zealand Space Agency
- Rocket Lab
- SpaceX

How does this satellite compare with others?

MethaneSAT is a critical complement to, not a substitute for, other satellites.

Other satellites can provide high-resolution data for specific, pre-targeted sites. These are particularly helpful for facility owners who are trying to identify larger leaks from likely sources throughout their operation or monitoring priority areas prone to large emission events. But existing satellites do not capture the myriad smaller but pervasive leaks throughout the energy supply system and cannot calculate total emissions for an energy basin, region, country or the world.

Because MethaneSAT can precisely measure methane levels with high spatial resolution over wide areas, it sees and measures these smaller, area-source emissions, which can account for more than 80% of total emissions in many regions.

With the addition of MethaneSAT, the satellite ecosystem will provide the comprehensive emission data we need to drive global emission reductions.

Global Mapping	Area Mapping	Local Mapping
Global & large-scale regions Large point sources	Area sources Point sources Sector-wide quantification	Point sources Facility level attribution

GHGSat

30m x 30m pixels
10 km swath

PRISMA

30m x 30m pixels
30 km swath

Carbon Mapper

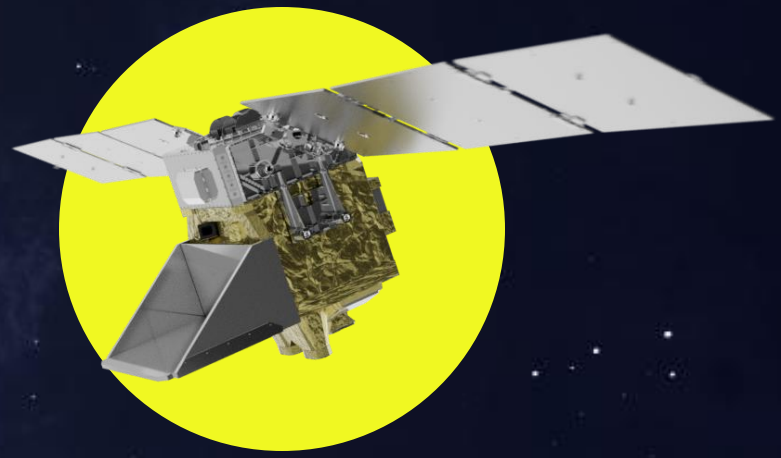
30m x 30m pixels
18 km swath

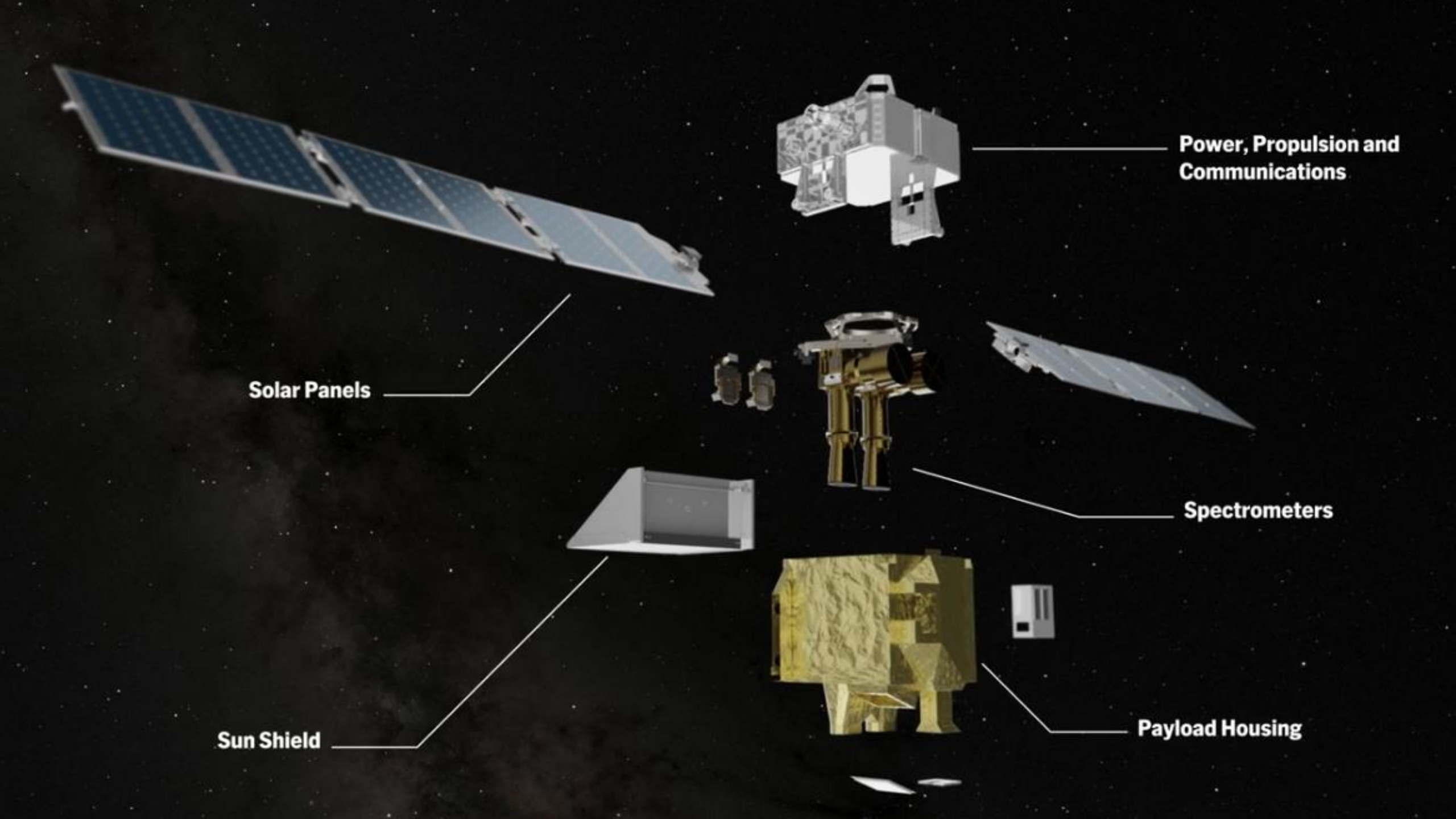
TROPOMI

7,000m x 5,500m pixels
2,600 km swath

MethaneSAT

100 m x 400 m pixels
200 km swath




Power, Propulsion and Communications
Solar Panels
Spectrometers
Sun Shield
Payload Housing