

## The New York Times

# *An Eye in the Sky Could Detect Planet-Warming Plumes on the Ground*

An environmental group says it will spend millions to launch a satellite that could help fight climate change by identifying methane leaks with pinpoint accuracy.

**By John Schwartz**

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Tom Ingersoll, a longtime satellite entrepreneur, admits being startled by a call he received last year: A nonprofit foundation wanted to build a satellite and launch it into orbit to help fight climate change. “I thought, ‘Wow, that’s kind of crazy.’”

In February, he signed on as the project’s manager, after having taken a long look at the technologies required. “It’s hard, but we could probably pull it off,” he said.

Now the rest of the world can decide for itself. On Wednesday, Fred Krupp, the president of the Environmental Defense Fund, announced plans for MethaneSAT, an orbital eye in the sky that could monitor industrial methane leaks all over the planet.

Methane remains one of the thorniest climate problems. It is the major component of natural gas, which produces half the carbon dioxide of coal when burned to run electric plants. But when methane leaks, it is a potent greenhouse gas that traps more than 80 times as much heat as carbon dioxide in its first 20 years in the atmosphere. By some estimates, human-caused emissions of methane are thought to be responsible for about a quarter of the warming being experienced today.

But figuring out where methane emissions are coming from is a major challenge. The colorless, odorless gas has proved difficult to measure at the source of leaks without nearby access to the sites. Early attempts by the Environmental Protection Agency to determine the scope of the problem significantly underestimated emissions.

Methane leaks are relatively inexpensive to fix, and stopping leaks allows energy companies to sell more gas. The International Energy Agency has estimated that as much as 50 percent of the 84 million tons of methane emitted by the oil and gas industry every year — from leaky wells and pipes and other causes — “can be mitigated at no net cost, because the value of the captured methane could cover the abatement measures.”

The Environmental Defense Fund has worked for many years on methane issues; it organized a five-year, \$20 million research effort into leaks in the United States across the production and supply network. That research, which helped the E.P.A. adjust its national emissions estimates, involved local measurements from ground instruments and airplane flyovers. But such methods are not always feasible — or welcomed — in other countries.

To address the problem of finding leaks around the world, a recent report from the National Academy of Sciences called for methane monitoring from space, where international access is not a problem. “Satellite measurements are critical,” said David T. Allen, a professor of chemical engineering at the University of Texas who served on the committee that wrote the report. “Right now satellite measurements are one area in which we have very limited information.”

Some government-launched science satellites do monitor methane, but their instruments lack the resolution to pinpoint sources on the ground. Some commercial ventures also detect methane from space, but their data is proprietary.

MethaneSAT, by comparison, is designed to detect emissions across the planet with sufficiently high resolution to identify sources. The organization plans to make the data publicly available so that companies, policymakers and regulators can take action.

Identifying major sources of leaks could help governments and industry coalitions work together to address the problem, said Daniel J. Jacob, a professor of atmospheric chemistry and environmental engineering at Harvard. “How can you do climate policy for methane if you don’t know where the sources are?” he said.

Mr. Krupp, the Environmental Defense Fund president, is announcing the initiative at the TED2018 conference in Vancouver, British Columbia. His organization has already obtained most of the “tens of millions of dollars” that building the satellite and launching it should cost, Mr. Krupp said in an interview. Much of the early money came from the Robertson Foundation, which has environmental work as part of its focus. The launch is planned for late 2020 or early 2021.

Space is a tough neighborhood; timetables slip and challenges proliferate. But the “new space” movement has helped move orbital launches out of the realm of superpowers and put it within the reach of businesses and nonprofits.

“I think this is entirely feasible,” said Peter Platzer, the chief executive of Spire Global, a satellite company, who was not involved with the MethaneSAT project but has talked with members of the team extensively.

The environmental group is also working with Steven C. Wofsy, a professor of atmospheric and environmental science at Harvard, and his colleagues to address the daunting technology challenge of creating an infrared spectrometer that can detect methane plumes on the Earth’s surface.

The lead scientist for a major methane-detecting satellite program applauded the idea. Ilse Aben, a senior scientist at the Netherlands Institute for Space Research, presented the first data this week from a European satellite launched in October with an instrument that can detect methane, but at lower spatial resolution. She said the Environmental Defense Fund's plan was "really complementary to what we have now."

Mr. Ingersoll, MethaneSAT's project manager, said that some of the technologies to be incorporated into the satellite had been developed for defense purposes, so "it's fun to see this technology broaden, and bring potentially very beneficial applications to society."

Discussions and research on the project began in 2015, Mr. Krupp said, as a way to extend his group's methane monitoring beyond North America. Since the 2016 election, the Trump administration and the E.P.A. administrator, Scott Pruitt, have tried to roll back Obama-era rules intended to crack down on leaks.

"We now see an added urgency that this satellite will give us data from the United States — much of it won't be available any other way, given the actions that Pruitt has taken," Mr. Krupp said. "We can't wait for Washington, especially not now."

John Schwartz is part of the climate team. Since joining The Times in 2000, he has covered science, law, technology, the space program and more, and has written for almost every section. @jswatz • Facebook

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