

Advancing scalable, efficient CO₂ monitoring in China

Case Study



The client:

Beijing Santech Technology Co., Ltd.

Vaisala solution:

CO₂ Probe GMP343

Beijing Santech Technology Co., Ltd. (Santech), with over 15 years of experience in China, is a dedicated player in the field of environmental monitoring. Specializing in atmospheric, aquatic, and noise monitoring as well as laboratory equipment, the company offers a comprehensive range of products, systems, maintenance services and data analytics. Their primary clientele includes national and local environmental monitoring centers, underscoring their commitment to supporting environmental protection efforts across the country.

THE CHALLENGE:

Develop a CO₂ monitoring system for easy large-scale deployment

Environmental agencies use greenhouse gas (GHG) analyzers to track gas levels in the atmosphere, analyzing trends and impacts

on climate. GHG analyzers help gauge the effectiveness of emissions control efforts through continuous monitoring of carbon dioxide (CO₂) and other emissions.

Santech faced the challenge of developing a cost-effective, lightweight, and integrated mid-accuracy CO₂ monitoring system that would achieve CO₂ measurements with minimal drift over long-term outdoor operations. The system would address the limitations of traditional high-cost, high-accuracy GHG analyzers that require demanding deployment conditions and are not suitable for high spatial-temporal resolution needed for urban CO₂ emission assessments.

The organization aimed to launch a monitoring system that can easily and cost-effectively be used to build up a dense network in cities.

"In the past, China had been battling with air quality, and adopting the high-density, low-cost air quality monitoring network contributed to the improvement of air quality in China. The next battle we need to fight for is effective climate change mitigation with GHG measurement data. We believe that deploying cost-effective and easily installable mid-accuracy CO₂ monitoring systems in megacities can also greatly enhance CO₂ emissions monitoring. Our R&D team's development and testing confirm that these systems, using Vaisala GMP343 sensors, offer an exceptional solution."

*Wu Jun
CEO, Beijing Santech Technology Co., Ltd.*

THE APPROACH:

Accurate measurement technology that meets demanding requirements

Santech implemented an innovative solution by creating a CO₂ monitoring system featuring the Vaisala CO₂ Probe GMP343 in addition to humidity, temperature and pressure sensors and a custom-designed data collection system.

GMP343 – a silicon-based non-dispersive infrared (NDIR) sensor – is a small, lightweight and rugged diffusion-aspirated or flow-through CO₂ probe with low power consumption. Designed for use in harsh environments, especially outdoors, the probe has both mirror and probe heating to prevent condensation on the optics. It reduces operating costs with long-term stability and reliability.

Santech's CO₂ monitoring system is designed to be lightweight, solar-powered, and capable of wireless data transmission, allowing for flexible deployments such as pole installations, mobile measurements, and frequent relocations. The system's design makes it easy to deploy in dense networks across cities, providing a cost-effective alternative to traditional systems.

THE RESULTS:

An exceptional device for tracking emissions and addressing climate change

The implementation of GMP343 into their CO₂ monitoring system has empowered Santech to offer a highly portable and efficient solution for CO₂ emissions tracking. This results in more comprehensive data collection, facilitating the development of effective policies to combat climate change.

The system's success has led to plans for further promotion to governmental customers, aiming to enhance insights into CO₂ variations across temporal and spatial dimensions. The system will ultimately contribute to reducing GHG emissions in China, with the potential to advance CO₂ monitoring in megacities.

Why Vaisala?

As the global leader in weather and environmental measurements, Vaisala provides trusted weather observations for a sustainable future. With nearly 90 years of innovation and expertise plus customers in 170+ countries from the North and South Poles to Mars, we help provide the most reliable and accurate weather and climate information for better and safer daily lives.

Our instruments and intelligence are known as the gold standard for precision and reliability. As a sustainability leader we enable meteorology professionals to better understand, forecast and explain climate change. We continue to channel our curiosity into climate action and new ways of enabling a better planet for all.

