

Case Study

Real-Time Dust Monitoring Drives Award-Winning Study of Particulate Matter in China

The Shaoxing EPA used the Dust Sentry to build its town-level PM_{2.5} monitoring network to comply with China's new air quality monitoring regulation.



Project

Shaoxing EPA

Services

Dust Sentry PM_{2.5} Monitor

Location

Shaoxing, China

Measurements

PM_{2.5} and weather

Date

2016 - 2017

Sector

Urban



The customer

Shaoxing is a city of Zhejiang Province with 118 towns and sub-districts, approximately 200km away from Shanghai. Being the most ancient city in Zhejiang, today Shaoxing is also famous for its textile industry, printing and dyeing industry. In 2015, Shaoxing won the title of China's National Civilized City. They then set a goal to win State-Level Demonstrational City of Ecology & Civilization (SLDCEC) by 2020.

The Shaoxing Environmental Monitoring Centre (EMC) works directly under Shaoxing Environmental Protection Agency (EPA). Shaoxing EMC is responsible for monitoring air, soil, and water to support Shaoxing EPA to make good policy and regulatory decisions.

The problem

In 2015, China State Council issued Construction Scheme of Environmental Monitoring Network. This regulation required different levels of EPA and EMC to have higher levels of air quality monitoring than they had previously. Alongside this, the State Council issued an organization reform guideline for local EPAs to support the scheme.

To achieve the city's 2020 development target, and met the annual air quality improvement goals during the 13th five-year plan, Shaoxing EPA set a goal to deploy PM_{2.5} monitoring stations in its 118 towns and sub-districts.

The stations were distributed across 7 counties/districts, to form an air quality monitoring network covering the whole territory. This enabled Shaoxing EPA to monitor and report on the air quality KPIs down to all counties, districts, towns and sub-districts.



The solution



Image caption: Screenshot of the mobile phone app showing the real-time data from all Dust Sentry monitors

Shaoxing EPA chose Aeroqual's Dust Sentry to build its town-level PM_{2.5} monitoring network for several reasons. Tonglu, a nearby county, had set up 15 of Aeroqual's Dust Sentry monitors one year prior, which produced good data and displayed long-term stability. At the beginning of their project, Shaoxing EPA visited monitoring sites in Tonglu and discussed with local EPA users. Tonglu's positive experience using the Dust Sentry provided the Shaoxing EPA further confidence to use the monitors themselves.

Limited government budget meant Shaoxing EPA preferred the Dust Sentry compared to traditional reference stations. The project was rolled out over two phases, in 2016 and 2017 respectively. The strong service and support provided by Aeroqual's partner, Shanghai Digital Sensing Technology Ltd (Shanghai DST), was an additional benefit. Six-parameter weather monitor and video cameras were installed with each PM_{2.5} monitor

Shaoxing EPA used bespoke software to show the real-time monitoring data from the Dust Sentry on their internal management platform, which included a mobile phone app that made the data public.

“Now we can do environment forewarning. Data itself can speak, it’s a progress from total quantity control to quality improvement.”

Yongming Zhang
Director of Shaoxing EPA

Evaluation

The two-phase project was inspected and accepted respectively in December 2016 and July 2017. Shaoxing now uses the PM_{2.5} data to rank 90 towns/sub-districts monthly and calculate the top 10 and bottom 10 towns/sub-districts in order to evaluate and address their air quality management capability.

“In the past we didn’t have data to speak, now every town has monitoring data, territorial responsibility awareness of town government increases a lot”, says Jing Wu, Chief Engineer of Shaoxing EPA.

The project in Shaoxing was reported by China Environment News on its first column of the front page in February 2017. China Environment News is a state-level news agency directly under Ministry of Ecology and Environment of China.

In November 2017, a team of experts organized by Clean Air Alliance of China (CAAC) went to Shaoxing and did a site inspection and evaluation. The Dust Sentry network produced good data quality and displayed long-term stability of sensor-based PM_{2.5} monitor, which exceeded the experts’ expectations. Shanghai DST won the 3rd ‘Bluetech Award’ from CAAC on Advanced Monitoring Technology for their solution, system integration and technical service in the Shaoxing project.

