OIZOM
REDEFINING RESOURCES

CASE STUDY
Smart City

Monitoring Cross-Border Air Quality on the Romania – Serbia Frontier with a 20-Station Polludrone Network

INTRODUCTION

Timiș County Council deployed 20 Custom-Configured Oizom Polludrone Air Quality Monitoring Stations across towns near the Romania-Serbia border to provide continuous, locally distributed pollution data. As part of the INTERREG IPA Romania-Serbia 2021-2027 ***"Blue Sky - The Solution to Air Pollution"*** project, the network measures particulate matter, key regulated gases, and meteorological parameters, streaming data in real time to the Envizom platform.

This network provides a modern, evidence-based foundation for environmental decision-making and cross-border cooperation, directly linking monitoring data to regional action.

20 Polludrone Stations Deployed	**10+** Parameters Per Station	**24/7** Real-time Data To Envizom

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THE CHALLENGE

The Romania–Serbia border region is shaped by a mix of agricultural activity, road traffic, and industrial processes; each contributes to the depletion of ambient air quality in ways that are difficult to disentangle without dense local measurements.

Before this project, the area lacked local monitoring, making it hard to accurately identify pollution sources or assess their actual impact on the population and the environment.

To address this gap, Timiș County Council established a monitoring network to enable:

- Continuous collection of air quality data across multiple locations, rather than isolated or periodic sampling.
- Identification of how pollutant concentrations vary between different areas of the land.
- Correlation of pollution with prevailing weather conditions to understand dispersion and likely sources.
- Greater transparency and public access to environmental information.
- Support for cross-border cooperation on environmental protection between Romania and Serbia.

WHY OIZOM POLLUDRONE

A cross-border monitoring network must measure multiple pollutants and meteorological variables simultaneously, remain reliable in outdoor conditions, and provide data to a single trusted platform. Oizom's Polludrone was selected to meet exactly these requirements.

Oizom's Polludrone addresses these needs in a single modular outdoor unit:

- Multi-parameter sensing in one station, measuring particulates, regulated gases, and meteorological data, reducing the cost and complexity of separate instruments.
- Field-grade reliability, with an outdoor-rated enclosure and onboard data handling for continuous, unattended operation across rural and peri-urban sites.
- Native integration with Envizom, enabling all stations to stream to a single cloud platform and operate as a single, coherent network.
- Meteorological data alongside pollutants, enabling correlation of concentrations with weather to identify dispersion and sources.

THE DEPLOYMENT

A network of 20 Custom-Configured Polludrone stations was installed across the Serbia-Romania cross-border area, forming a distributed network to capture local variations in air quality. Each station continuously samples its environment and automatically transmits data to Oizom's AI-powered platform, Envizom, for real-time aggregation, visualization, and analysis.

To make air quality information easier for the general public to understand, Beam Light was installed externally on the device. Operating on real-time AQI (Air Quality Index) readings, the Beam Light provides an instant visual indication of air quality through color-coded alerts, allowing the general public to quickly assess air quality.

Each station monitors a wide range of pollutants and meteorological parameters:

CATEGORY	PARAMETERS MEASURED
Particulate matter	PM_1 (very fine), $PM_{2.5}$ (fine respirable), PM_{10} (inhalable), and PM_{100}
Gases	SO_2 (sulfur dioxide), O_3 (ozone), NO_2 (nitrogen dioxide), CO (carbon monoxide)
Meteorology	Atmospheric pressure, temperature, relative humidity, wind speed, wind direction

INSTALLATION DETAILS
20 Units of Polludrone Custom

By measuring meteorological parameters alongside pollutants, the network can correlate pollutant concentrations with wind speed and direction, which is essential for tracing pollution sources in a region with diverse activities.

RESULTS

The monitoring network has transformed how environmental authorities understand, manage, and communicate air quality across the region. By delivering continuous, highly accurate data, it enables faster responses, deeper insights, and stronger cross-border environmental collaboration.

KEY OUTCOMES

Continuous Air Quality Visibility
- Real-time access to environmental data across the monitored area.
- Early identification of pollution events and changing air quality conditions.

Deeper Environmental Insights
- Improved understanding of pollutant movement through correlation with meteorological conditions.
- Easy identification of potential emission sources and pollution hotspots using Envizom's dashboard and analytics feature.

Stronger Cross-Border Collaboration
- Shared environmental intelligence between Romanian and Serbian authorities.
- Better assessment of transboundary pollution and its regional impacts.

Greater Transparency & Public Trust
- Reliable, accessible air quality information for communities.
- Enhanced public awareness and informed engagement on environmental issues.

Compliance-Ready Reporting

- Automated generation of air quality reports through Envizom, reducing manual effort and improving data accessibility.
- Reliable historical records and trend data to support environmental compliance, regulatory submissions, and long-term policy evaluation.

IMPACT

By implementing this network, Timiș County Council has advanced toward a modern environmental monitoring system. The solution enhances the region's capacity to monitor air pollution, supports data-driven decisions, reinforces cross-border cooperation, and helps protect public health and the environment.

Oizom specializes in real-time environmental monitoring solutions designed to help organizations measure, manage, and improve environmental performance. Our comprehensive portfolio includes air quality, weather, noise, and emission monitoring systems, powered by advanced sensor technology and cloud-based analytics. Trusted across industries, governments, and smart city initiatives, Oizom's solutions enable continuous monitoring, regulatory compliance, and actionable environmental intelligence.