Connecting people to nature.

nesa®
A MACCAFERRI Company

WHO WE ARE

Our passion: measure to prevent

We are an Italian company that studies and understands nature and all the extraordinary expressions of its strength.

Our **primary goal** is to ensure human safety and preserve nature.
Our **mission** is to control, measure, and provide data for analysis and predictions. For this reason, we design, create, and install environmental monitoring solutions worldwide.

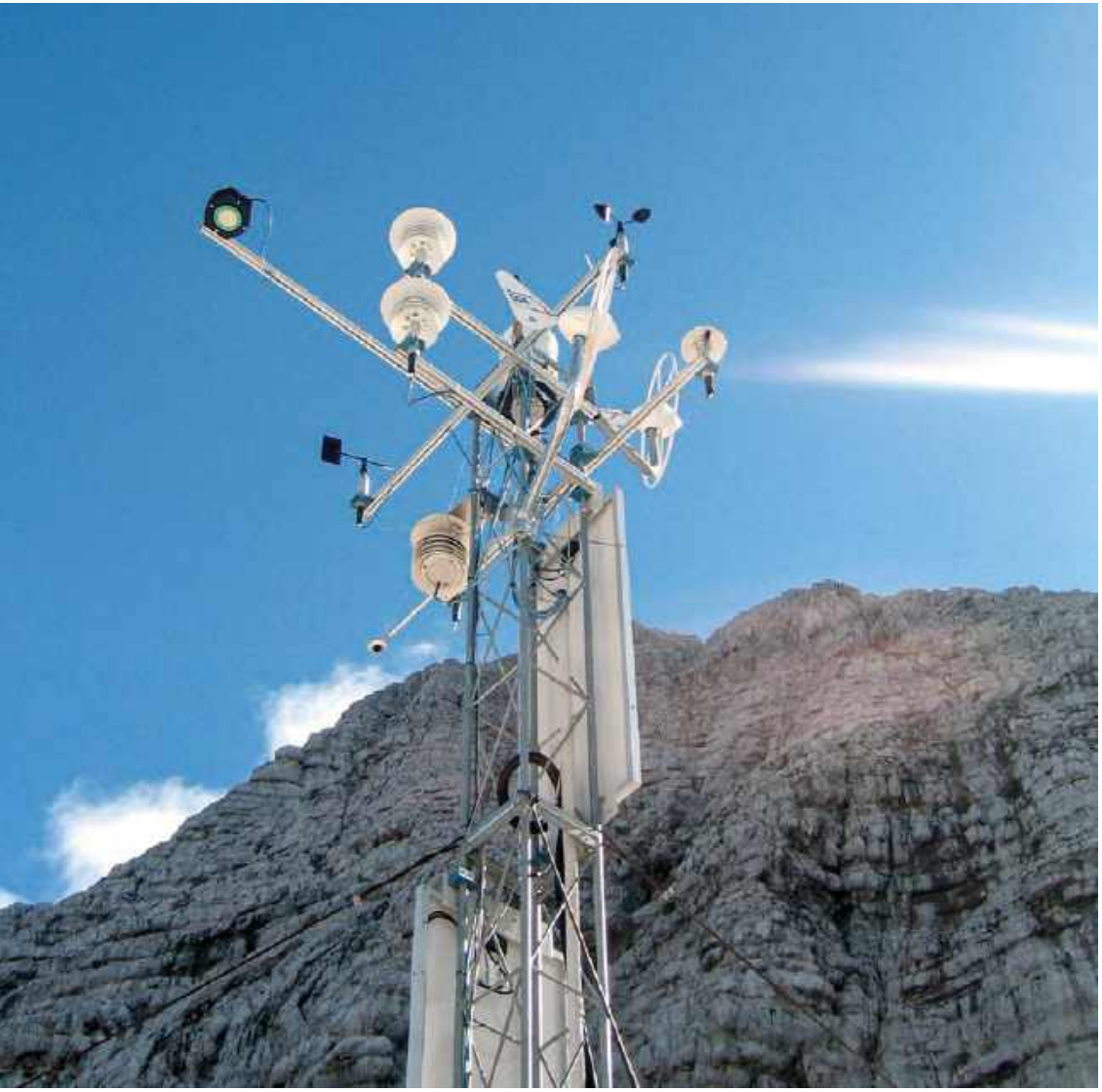
Since 2004, we have been active in the field of IoT *(internet of Things);* to address the challenge of **connectivity**, we leverage our technology to better understand natural phenomena and mitigate their effects. We are pioneers of **advanced** and easily **integrable** systems that guarantee ease of use and data quality. Continuous **research** and **innovation** are our watchwords. Our ability to build **customized** solutions is our strength.

Our skills, technical know-how and technological drive in the sector of monitoring and early warning systems, combine perfectly with the innovative products and solutions developed by **Maccaferri**, a global leader of sustainable solutions for the civil and environmental engineering construction market which, since 2024, has acquired a majority stake in the company.

Early warning and timely action represent one of the safest and most cost-effective methods to reduce disruptions from **environmental disasters**.
However, to date, only half of the countries in the world are protected by multi-hazard early warning systems. The numbers are even lower for developing countries.

«All people on Earth must be protected by early warning systems within five years»

António Gutierres, Secretary-General of the United Nations, 2022



Research in the forefront

Innovation is in our DNA. We have over twenty years of history, but our approach to research remains that of a start-up.

Curious, bold, and capable of pioneering innovation, we have introduced, studied and improved **technologies** at their dawn, applying them to the world of meteorological and climate monitoring. We have been and want to continue to be **forerunners** of solutions.

Our **research team** is led by people with extensive multidisciplinary experience and has always collaborated with Universities, Research Centers, and private Institutions.

Our milestones are:

- > Data quality and accessibility
- > Security in information transfer
- > Optimization of energy needs
- > Ease of installation

The goal we pursue every day is to achieve the best solution capable of guaranteeing the simplest and most effective use for customers and communities.

GEOGRAPHIC PRESENCE

We have implemented monitoring and remote-control systems on all continents, even in extreme climatic conditions.

More than **6,000 stations** installed worldwide in different climatic conditions ranging from Siberian cold to Saharan heat, and one of the largest hurricane monitoring networks in the Caribbean, allow us to guarantee the **performance** and **quality** of our products and systems.

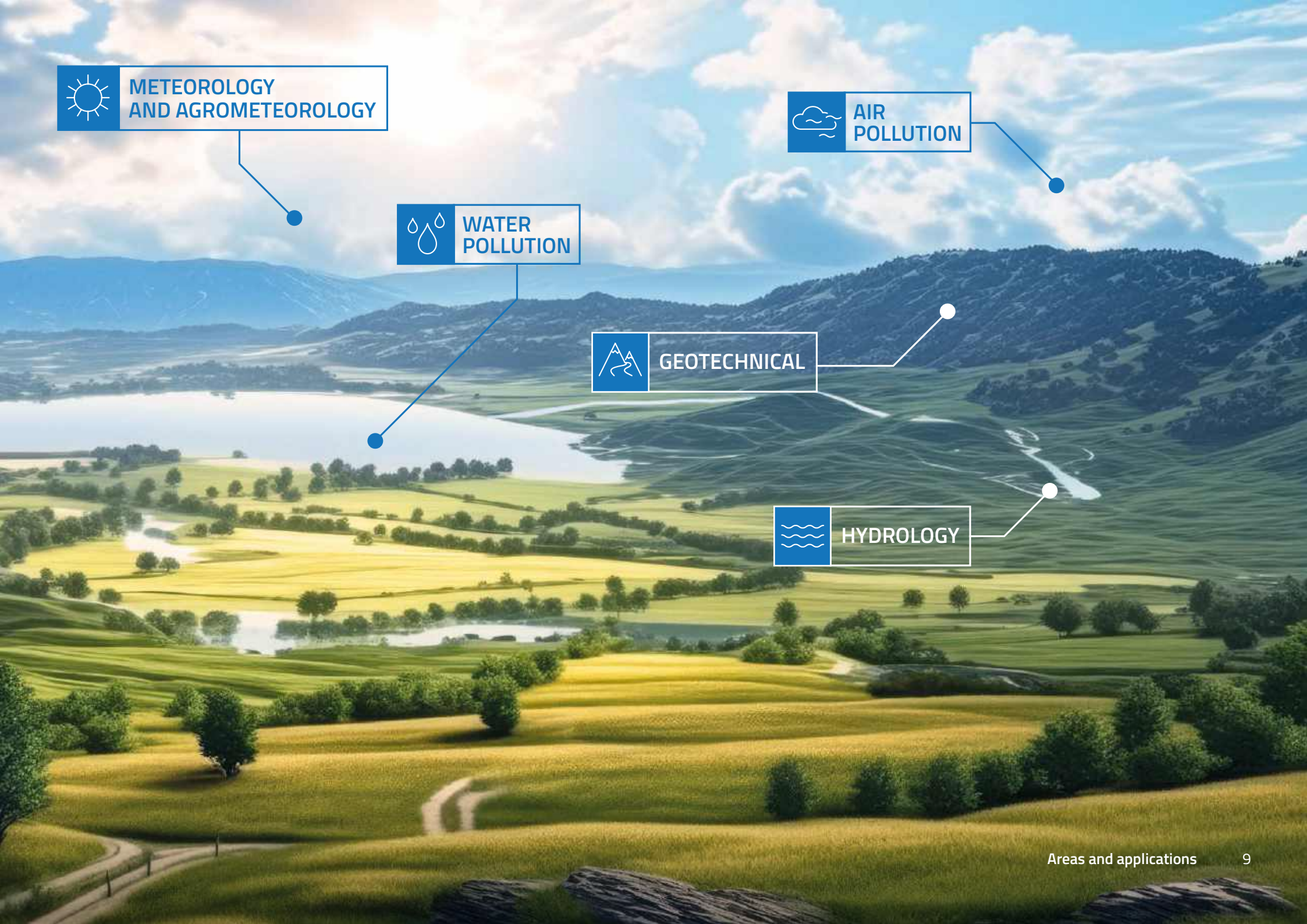
+6,000
stations

+80
countries


mesa

AREAS AND APPLICATIONS

We design, manufacture, and install systems and instruments for environmental prevention and safety, ensuring high-quality technologies and European production.


METEOROLOGY
AND AGROMETEOROLOGY
AIR
POLLUTION
WATER
POLLUTION
GEOTECHNICAL
HYDROLOGY

AREAS AND APPLICATIONS

PHOTOVOLTAIC MONITORING

The monitoring stations for photovoltaic sites, or certification laboratories for photovoltaic panels, are manufactured according to ISO9060 and IEC 61724-1 standards. These professional and highly reliable instruments are easy to install and equipped with a powerful acquisition system that allows real-time monitoring of solar energy production and data certification. Data and central unit management can be carried out remotely via GPRS, radio, satellite connections, or locally via ModBus interfaces to network SCADAs.

WIND MONITORING

The automatic systems for monitoring wind conditions, compliant with IEC 61400-12, measure wind "quality" for wind energy production. Monitoring takes place on towers up to 100 meters high, with sensors positioned at different heights along a vertical profile. Sensors and data collection systems must meet very stringent requirements and high performance standards. Nesa is among the few manufacturers worldwide to have First Class classification for this instrumentation.

LANDFILLS AND PLANTS FOR WASTE RECYCLING

The stations are designed to monitor landfills, calculating potential evapotranspiration using the FAO-approved Penman-Monteith method, in compliance with D.Lgs.36-2003 and D.L.vo 121/2020. They come equipped with instruments to measure temperature, humidity, rain, net solar radiation, wind speed and direction. They can also include multiparameter probes to measure chemical-physical parameters of water such as pH, redox, oxygen, and conductivity. Connectivity via GPRS, radio, satellite, etc., allows for remote management of data and the central unit via an internet browser, without the need for specific software.

METEOROLOGY AND AGROMETEOROLOGY

Automatic stations conforming to WMO *(World Meteorological Organization)* guidelines, with variable sensor types, numbers, and positions depending on the application, are used for standard monitoring by organizations and government entities for forecasting purposes. Nesa offers a complete range of stations as per WMO guidelines, with instrumentation installed at heights between 2 and 10 meters. For the Agrometeorology sector, specific and easy-to-use IoT solutions are available.

WATER POLLUTION

The automatic stations monitor water quality to provide insights into chemical-physical states. They measure parameters specified by the European Directive 2000/60/EC, which focus on the health protection of species and biodiversity sustainability rather than direct human health risks. This monitoring enables targeted interventions to mitigate pollution for both surface and groundwater.

AIR POLLUTION

For air quality analysis, the use of compact sensors with IoT technology allows comprehensive monitoring of specific areas or sites, such as bus stops, creating statistics on the environmental conditions in high-traffic areas.

HYDROLOGY

The stations are designed to measure and control hydrological risks (rainfall, floods, high water levels) and water levels (rivers, reservoirs, aquifers). The basic solution measures rainfall and water levels, with data transmission via an IoT device. Cloud applications allow for monitoring measurements and receiving alarm notifications via app. More advanced solutions include dataloggers, additional sensors, local alarms, and data transmission via satellite. The stations can be integrated into complex monitoring networks and are designed for quick installation and activation.

GEOTECHNICAL

Scan the QR Code to discover the full range of Maccaferri HELLOMAC series.

HELLOMAC
Smart Engineering, Safer Communities

CASE HISTORIES

METEOROLOGY AND AGROMETEOROLOGY

Empowering weather resilience

West Africa - WASCAL Weather Station Network

CHALLENGE

The West African Science Service Center on Climate Change and Adapted Land Use (WASCAL) needed to address increasing climate variability and improve local systems' resilience. The challenge was to strengthen, with Germany's support, climate research infrastructure in ten West African countries.

SOLUTION

NESA won an international tender to supply 50 automatic weather stations, complete with software and training. The stations, compliant with WMO *(World Meteorological Organization)* standards, are equipped with advanced sensors and transmit real-time data to the central server via 4G modem. Our "Sunflower" software processes the data for accurate monitoring.

BENEFIT

The stations are operational in ten countries (Benin, Burkina Faso, Ivory Coast, Gambia, Ghana, Mali, Niger, Nigeria, Senegal, and Togo) and provide reliable climate data for research and planning adaptation measures.

GEOTECHNICAL

Mitigate risk and consequences of landslides

Italy - Val Rabbia Monitoring System

CHALLENGE

After 11 years from the first experimental plant in Val Rabbia, it was necessary to upgrade the monitoring and alert system for debris flows, ensuring greater efficiency and safety for the valley's inhabitants.

SOLUTION

HELLOMAC GEO technology was used for the production and installation of advanced sensors at six points along the stream. The tear sensors detect the movement of boulders during rains, while acoustic and visual signals alert the valley, blocking transit at the Rino and Sonico bridges.

BENEFIT

The new system ensures significant maintenance cost savings and significantly increases the safety of the inhabitants, thanks also to a dedicated APP for real-time monitoring.

WIND MONITORING

Wind performance

Italy - Anemometric Monitoring

CHALLENGE

With the growing demand for wind energy, it is crucial to identify suitable sites for installing wind turbines, conducting accurate measurements of wind speed and direction at different heights.

SOLUTION

NESA supplied and installed anemometric towers and poles up to 100 meters, equipped with advanced anemometers and data loggers. The towers are mounted following IEC 61400-12 standards, ensuring maximum precision and data reliability necessary for project financing.

BENEFIT

NESA's anemometric campaigns, supported by MeasNet certified sensors, allowed precise and reliable data collection, facilitating the identification of the best sites for wind energy production. The innovative wireless solution further improved the installation and protection of the equipment.

PHOTOVOLTAIC MONITORING

How much energy comes from the sun?

Mauritius - Photovoltaic Monitoring

CHALLENGE

The Mauritius government aimed to increase the renewable energy share to 35% and needed precise solar radiation data to support the development of a detailed solar map.

SOLUTION

NESA provided 13 automatic stations for photovoltaic monitoring, equipped with pyranometers compliant with ISO9060 standards and air temperature sensors. Data collected by Linux data loggers are transmitted via 3G modem and made available online.

BENEFIT

The collaboration with the University of Mauritius and UNDP *(United Nations Development Program)* led to the project's success, with accurate solar data now accessible online. NESA's remote post-sale support ensured efficient and reliable implementation, contributing to advancing solar energy production on the islands.

CASE HISTORIES

WATER POLLUTION

The smartification of waters

Italy - Groundwater Monitoring

CHALLENGE

Landfills and waste treatment plants must monitor environmental conditions to prevent soil and groundwater pollution, as required by D. Lgs. 36/2003. Leachate contamination represents a significant risk, requiring continuous monitoring of groundwater quality.

SOLUTION

NESA developed and installed a monitoring system in one of the largest landfills in Southern Italy. The system includes 7 peripheral stations located in the area's wells and a central meteo-climatic station. The stations use IoT technology to communicate data to a cloud control software.

BENEFIT

The system monitors over 50 environmental and water quality parameters, alerting via APP in case of anomalies, allowing quick interventions. The central station also collects air quality data, ensuring comprehensive monitoring. This solution has proven effectiveness in various applications, confirming the quality and reliability of NESA systems.

AIR POLLUTION

Even the stones speak

Italy - Environmental Monitoring

CHALLENGE

Matera, a UNESCO heritage site rich in history, needed an advanced system to monitor air quality and environmental conditions, integrated non-invasively into its historic site.

SOLUTION

NESA created a network of 14 intelligent environmental monitoring stations (SMART E-MOST) spread throughout the city. These stations use IoT technology to acquire and transmit real-time data, providing a constant snapshot of the city's environmental status.

BENEFIT

Over 220 different measurements are available through a simple web map and a smartphone APP, allowing citizens easy access to information on air quality and environmental conditions. This innovative solution demonstrates NESA's technological leadership in environmental monitoring.

LANDFILLS AND PLANTS FOR WASTE RECYCLING

People come first

Italy - Asbestos Landfill Monitoring

CHALLENGE

Casale Monferrato faced severe environmental and public health problems due to asbestos pollution. Managing contaminated areas required advanced solutions to protect the population and the environment.

SOLUTION

The municipality created one of the largest landfills for storing inert asbestos, with a capacity of 90,000 m^3, in compliance with the European Landfill Directive (D.Lgs. 36/03). Since 2007, NESA has installed and managed climatic and meteorological monitoring stations to control the environment around the landfill.

BENEFIT

NESA's advanced technological solutions, with remote control, ensure continuous and precise monitoring of environmental conditions, ensuring the landfill's safety and minimizing risks to the local population.

HYDROLOGY

The flood sentinel

Italy - Monitoring of the Bisagno River Basin

CHALLENGE

The Bisagno river basin in Genoa is known for the risk of sudden and devastating floods. The floods of 2011 and 2014 demonstrated the need for an effective alert and monitoring system to prevent tragedies.

SOLUTION

NESA installed a system consisting of strategically positioned rain gauge stations upstream and a hydrometric level sensor at the confluence point. This system allows continuous monitoring and alerts via email, SMS, and App in case of emergency.

BENEFIT

Thanks to NESA technology and its ultra-low-power transmission system, it was possible to guarantee a high standard of reliability and a rapid response in case of critical events, ensuring the safety of men and vehicles during the construction of the spillway tunnel.

ENVIRONMENTAL SUSTAINABILTY

We adopt eco-friendly practices and promote the use of renewable energy to reduce our environmental impact.

Our advanced technological solutions are designed to **monitor the environment** efficiently and sustainably, contributing to the **preservation of natural resources**. For us, sustainability also means adopting a short supply chain for primary supplies and processing, thereby ensuring a **reduction in emissions** and **transportation**.

We use **recyclable materials** for our products and strive to achieve energy consumption that is at or near zero by exclusively employing **energy from renewable sources**.

We continuously invest in research to use **low-impact materials**, ensuring that every stage of our production process meets the highest **sustainability standards**.

We collaborate with local communities and international organizations to support **conservation** and **sustainable development projects**.

Our dedication to sustainability is not limited to our products but is reflected in every aspect of our business, from daily operations to production processes.

We are committed to creating a more sustainable future for future generations, maintaining a balance between technological progress and respect for the environment.

CERTIFICATIONS

NESA's activities comply with the UNI EN-ISO9001 and EN-ISO14001 quality standards, ensuring excellent product and service quality while also protecting the environment.

To ensure product traceability, our production process uses primary instruments certified by ACCREDIA or other important accredited testing laboratories (Colonnetti, PTB, CNR, etc.) according to **ISO17025** standards.

In the case of anemometers, for the First Class series, tests are carried out under rigorous conditions with the aim of obtaining Measnet certification.

NESA®

A MACCAFERRI Company

NESA Srl - Via Crociera, 11 - 31020 - Vidor (TV) - Italy
T: +39.0423.985209 - **F:** +39.0423.985305 - **E:** info@nesasrl.it

www.nesasrl.eu