

Press release

## IoT trends 2025: LPWAN, ESG reporting, smart regions

Low-energy networks based on LoRaWAN, NB-IoT or Mioty are convincing: ESG reporting with sensor-based measurement values and bundled expertise in the smart region

Schimberg and Berlin, 10 December 2024 – [Alpha-Omega Technology GmbH](#) supplies users around the world with [iot-shop](#), the largest online shop for low-power wireless networks (LPWAN). The pioneers of the IoT scene have also already supported over 5,000 companies and municipalities in implementing IoT projects. Based on their many years of experience and in-depth market knowledge, the experts see great potential and the following trends for sensor-based IoT solutions in 2025:

1. In many industries, more and more users are turning to LPWAN with the LoRaWAN, NB-IoT or Mioty wireless standards.
2. The technology also offers answers to future challenges: for example, the sensor-based measurement values create the data basis for legal requirements such as ESG reporting.
3. More and more often, communities are joining forces and pooling their IoT infrastructure and know-how around smart villages. This collaboration is creating smart regions in which smaller communities and rural areas can also benefit from the advantages of digitalisation.

### Trend 1: LPWAN technologies for sensor-based IoT are catching on

Stakeholders in a range of sectors – from manufacturing and services to retail, public utilities and local government – are using the Internet of Things (IoT) to optimise processes and increase efficiency. In many areas of application, low power wide area network (LPWAN) technologies are becoming more and more prevalent. Today, there are already many established IoT solutions based on LPWAN that are easy to install and customise. What's more, new applications are constantly coming onto the market, such as a camera that transmits data on road users in a privacy-compliant manner. And more and more companies are using this reliable option to monitor and control energy consumption, air quality, environmental data and resource utilisation. The solutions enable companies, research institutes and associations to continuously collect data on their needs, as well as to manage and analyse the data in real time and independently of their own location.

Jan Bose, founder and managing director of Alpha-Omega Technology, explains: *'The range of IoT solutions has increased significantly in recent years and will continue to do so. One reason for this is that LPWAN projects can be implemented quickly. Thanks to established technologies and user-friendly platforms, the solutions can often be implemented and used within a short time. This also enables companies to react quickly to current circumstances. Examples from the recent past include the use of CO<sub>2</sub> sensors to monitor indoor air during the pandemic and the intelligent control of heating systems during the energy crisis. However, smart sensors also help to save energy without having to rebuild the entire heating system.'* The technology also offers great potential for future challenges, as the following trend shows.

## **Trend 2: LPWAN creates a data basis for ESG reporting**

Legal and regulatory requirements, as well as market demands, are increasingly forcing the economy to make its measures for climate protection, sustainability and resource conservation transparent. For example, the EU's ['Corporate Sustainability Reporting Directive'](#) (CSRD) came into force at the beginning of 2023. It requires large companies to disclose the impact of their business activities on the environment and society by means of ESG reporting – a standardised EU-wide electronic reporting format. The abbreviation ESG stands for environmental, social and governance. The reporting should enable a structured analysis of the published sustainability information.

Companies that are required to report will create the necessary data basis by systematically recording various factors such as energy consumption, water consumption, air quality, wastewater pollution or types and quantities of waste. On the basis of the measured values, they derive specific measures, for example in the areas of energy saving, resource conservation and emission reduction. Data is collected throughout the company wherever environmental impacts arise, i.e. in production facilities, offices and logistics centres, or even in outdoor areas at water or energy sources.

More and more companies are deciding to use IoT sensors with LPWAN technologies to take the necessary measurements. Various specialised sensors are distributed throughout the infrastructure: they collect data from production machines, in storage rooms, on building infrastructure and in company vehicles. The data is stored centrally and prepared for ESG reporting. Standards and emission factors are used to calculate the actual environmental impact.

One example of an application is measuring electricity and gas consumption: smart energy meters in an IoT measure electricity consumption directly at machines and production plants. The sensors continuously send real-time data from each individual machine or production line. Flow sensors record the consumption of heating or process gases in production and transmit the values to central data systems via LPWAN. Detailed monitoring of energy consumption enables targeted identification of areas with high energy demand. This enables the company to reduce inefficiencies, avoid peak loads and implement targeted energy-saving measures.

Jan Bose emphasises: *'Building up the data basis and introducing ESG reporting are ongoing processes. Ideally, companies start as early as possible to collect data over several years and make developments visible. We recommend planning regular data collection, i.e. monthly or quarterly, to document current trends and progress.'*

### Trend 3: Smart regions

More and more often, communities are joining forces and pooling their IoT infrastructure and expertise in smart villages. This is how smart regions are emerging – typically in rural or suburban areas where several smaller communities come together in close proximity and with similar challenges and needs. They implement applications for energy monitoring, water and waste management, traffic control or environmental data collection. The communities benefit from each other's experiences, solutions and insights. This collaboration promotes faster learning and more efficient implementation. Sometimes they also share the IoT infrastructure, such as sensor data, gateways, platforms and the costs for these.

The central IoT platform can also be shared in a smart region. It offers central data management with regional customisations that can be accessed by all participating municipalities. The data is shared according to each municipality's own configuration and can be evaluated jointly. In doing so, each municipality focuses on the data that is relevant to them geographically and to their specific goals.

Jan Bose says: *'By sharing knowledge and successful application projects with each other, the municipalities support each other in implementing IoT applications faster and more efficiently. The central infrastructure can be set up in a leading municipality or at a regional technology partner. An IoT service provider can help to tailor the central platform to regional needs.'*

By cooperating within the framework of a smart region, smaller communities and rural areas can also benefit from the advantages of digitisation without having to bear the full costs and the entire learning process alone.

### Image material

The image material is available for download in printable quality and web-optimised: <https://iot-shop.de/blog/presse-1/iot-trends-2025-lpwan-esg-reporting-smarte-regionen-75>



With an LPWAN IoT, companies can also respond quickly to current circumstances thanks to established technologies and user-friendly platforms. One example is the intelligent heating control system in the energy crisis (Graphic: Alpha-Omega Technology).



The measured values of sensor-based IoT solutions provide the data basis for legal requirements such as ESG reporting (illustration: Alpha-Omega Technology).



When communities join forces to pool their IoT infrastructure and expertise in the area of smart villages, smart regions are created – typically in rural or suburban areas (diagram: Alpha-Omega Technology).



Jan Bose is managing partner of Alpha-Omega Technology GmbH & Co. KG and operator of [iot.shop](#) (photo: Alpha-Omega Technology).

#### **About Alpha-Omega Technology**

Alpha-Omega Technology GmbH & Co. KG, based in Schimberg and Berlin, Thuringia, was founded in 2016 by Jan Bose. By developing IoT applications based on low-power networks such as LoRaWAN, Alpha-Omega Technology creates innovative and cost-effective solutions for public and commercial customers. In addition to selling IoT hardware and developing software, Alpha-Omega Technology works with partners to establish IoT networks for local authorities and businesses and advises customers on implementation strategies. Alpha-Omega Technology operates [iot-shop.de](#), one of the largest online shops for LPWAN products in Europe. In addition to energy suppliers and local authorities, customers also include research institutions and industrial companies. Users and other interested parties can find more information at <https://iot-market.eu/>.

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