Cellular and LPWA IoT Device Ecosystems gives a comprehensive overview of the main wide area networking technologies for the Internet of Things – 2G/3G/4G/5G cellular, LoRa, Sigfox and 802.15.4 WAN.

This strategic research report from Berg Insight provides you with 100 pages of unique business intelligence including 5-year industry forecasts and expert commentary on which to base your business decisions.

**Highlights from the report:**

- **360-degree** overview of the main IoT wide area networking ecosystems.
- **Comparison** of technologies and standards.
- **Updated profiles** of the main suppliers of IoT chipsets and modules.
- **Cellular** IoT module market data for 2016.
- **Early adoption** trends for emerging LPWA technologies.
- **Cellular** and non-cellular LPWA IoT device market forecast until 2022.

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The Internet of Things is weaving a new worldwide web of interconnected objects. As of Q1-2017, more than half a billion devices were connected to wide area networks based on cellular or LPWA technologies. The market is highly diverse and divided into multiple ecosystems. This report will focus on the four most prominent technology ecosystems for wide area IoT networking – the 3GPP ecosystem of cellular technologies, the emerging LPWA technologies LoRa and Sigfox and the 802.15.4 ecosystem.

The potential market for IoT is popularly described as enormous as virtually every object could become networked. Over the past decades, adoption has spread from high value assets to medium value assets as the cost of communication has decreased. Today, the rise of LPWA technologies opens up new opportunities to address greenfield opportunities among low value assets that cost less than US$ 10. Measured by the potential number of nodes, the three largest opportunities in wide area IoT networking in high to medium value assets is energy meters, motor vehicles and buildings. Billions of energy meters enable consumption-based billing as the revenue base for the electricity and gas industry. Approximately 1.3 billion motor vehicles provide transportation of people and goods worldwide. Hundreds of millions of buildings provide housing and workspace for 7.5 billion humans. Next to these mega markets, there is a multitude of existing and potential device categories ranging in size from 1–100 million. These secondary market segments in high value assets can be divided into enterprise & government where adoption is driven by hard economic value and the consumer segment where soft individual values have a greater influence.

Global demand for IoT wide area networking technology is in a rapid growth phase. Berg Insight forecasts that annual shipments of cellular and non-cellular LPWA IoT devices will grow at a compound annual growth rate (CAGR) of 26.1 percent from 169.1 million units in 2016 to 679.5 million units in 2022. Based on initial feedback from the market, volume segments for non-cellular LPWA in the near to medium term will be asset tracking, buildings & security. The cellular IoT technology landscape is in a phase of transformation. GSM/GPRS is gradually losing its grip on the market, making way for 3G and 4G technologies. The trend will accelerate when NB-IoT devices start to appear in volumes by 2018. 2G will however remain as the main option in emerging markets where NB-IoT is unlikely to become widely available before the mid-2020s. By 2022, Berg Insight believes that 4G will account for 80 percent of global shipments of cellular IoT devices, with a relatively even distribution between high-speed CAT3+, mid-range LTE-M and low-end NB-IoT.

Annual shipments of non-cellular LPWA devices for IoT reached approximately 13.5 million units in 2016. 802.15.4 WAN accounted for 8.0 million units, while shipments of LoRa and Sigfox were around 4.0 million and 1.5 million units respectively. The vast majority of 802.15.4 devices are smart energy meters deployed in North America and other regions. Looking ahead, Berg Insight believes that LoRa and Sigfox will outgrow 802.15.4 WAN and achieve annual shipments in the range of 50–100 million units by 2022. Based on initial feedback from the market, volume segments for non-cellular LPWA in the near to medium term will be asset tracking, buildings & security and smart cities. Sigfox says it is gaining strong traction in supply chain management where it claims that leading players consider adding its connectivity solution to millions of pallets. Rapid success in this segment will be crucial if the company should achieve its target of 100 million devices under contract by 2018. Semtech, the company behind the LoRa technology, says that it is gaining strong traction in smart gas and water metering and building automation. In addition it has identified smart agriculture, logistics, smart manufacturing and smart cities/infrastructure as key future growth markets.

Annual shipments of cellular/non-cellular LPWA IoT devices (World 2016-2022)
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Glossary
About the Author

**Tobias Ryberg** is co-founder and principal analyst responsible for the M2M research series. He is an experienced analyst and author of numerous articles and reports about IT and telecom for leading Swedish and international publishers. All major vertical market segments for Wireless IoT have been his major research area for the past 13 years.

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