

LPWA MARKETS



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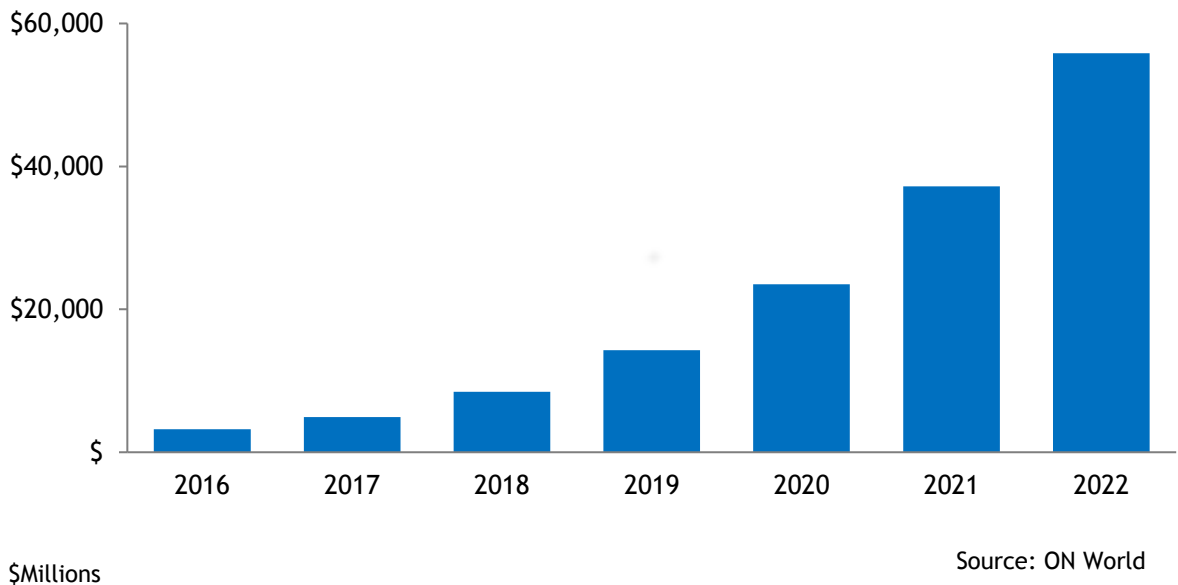
Executive Summary

Low Power Wide Area (LPWA) network growth continues to accelerate in 2018 as licensed and unlicensed developers deliver new Internet of Things (IoT) products and services. Competition among IoT network operators has intensified over the past year with several tier 1 operators worldwide rolling out LPWA networks and nearly 100 network operators in various stages of development.

Unlicensed LPWA networks (e.g, Sigfox and LoRa) cover much of Europe and many parts of Asia Pacific with IoT services offered by telecom operators such as Arqiva, Bouygues, Orange, KPN, Proximus, Swisscom as well as a growing number of IoT independent operators such as Senet, Thinxtra and UnaBiz. Mobile operators such as Deutsche Telekom, China Telecom and Vodafone are aggressively rolling out their licensed NB-IoT networks in Europe, China and Australia. In the U.S. most activity has centered on LTE-M until a few months ago when nearly all major operators including Verizon, Sprint and T-Mobile have fast-tracked their NB-IoT networks and services. By the end of 2018, most of the U.S., Europe and Asia Pacific will be covered with licensed IoT networks.

Today, 39% of the overall LPWA network operators are in Europe but Asia Pacific has over half of the NB-IoT network operators. The Internet of Things (IoT) is now a mainstream industry illustrated by the hundreds of companies with IoT and LPWA products and at this year’s Mobile World Congress conference. In 2022, LPWA revenues from equipment and associated services will reach \$56 billion.

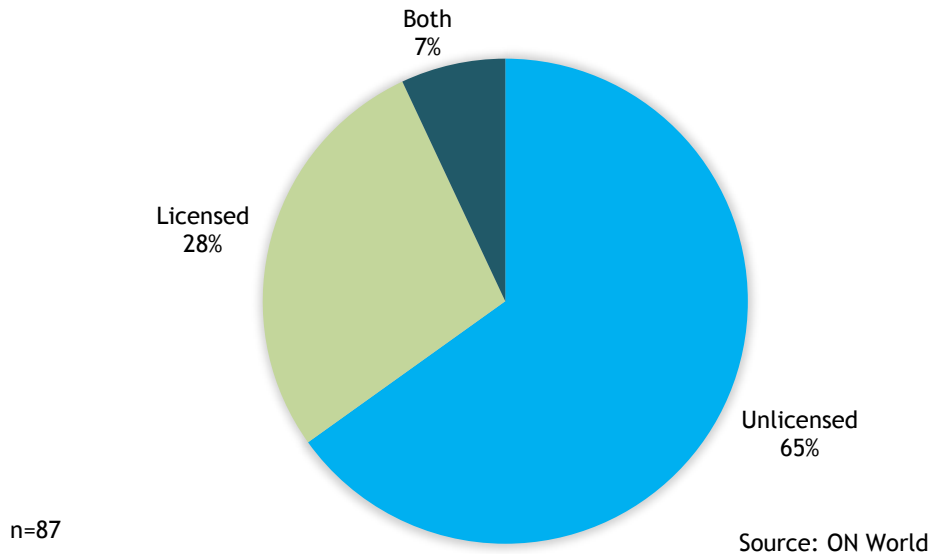
Figure 1: Global LPWA Revenues (2017-2022)



Our analysis of nearly 100 LPWA network operators found that unlicensed networks such as Sigfox and LoRa make up two-thirds today. Unlicensed networks have grown rapidly over the past few years through their ease of installation and the lack of barriers to entry. LoRa provides the added benefit of installation flexibility and adaptability that fits many different situations and customer needs including the option for private networks.

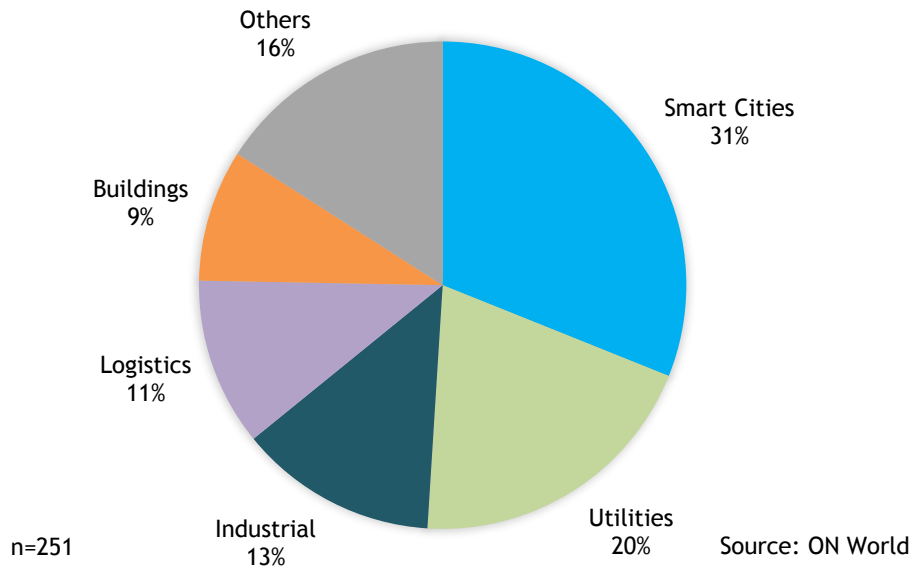
However, licensed LPWA networks such as LTE-M and NB-IoT are growing the fastest and make up nearly 1 in 3 of the LPWA operators we evaluated. NB-IoT network operator activity has accelerated over the past year and will grow 1800% this year compared with 2016.

Figure 2: LPWA Network Operators, Licensed & Unlicensed



We have identified 40+ unique LPWA applications that are currently commercialized, pilot tested or part of a proof of concept. Over half of the announced LPWA applications focus on smart city and utility applications such as metering, streetlight monitoring, parking solutions and waste management.

However, the number of applications continues to grow with many of these targeting markets that are currently served with short-range wireless technologies such as Bluetooth, WiFi or Zigbee. Examples include industrial equipment monitoring, oil and gas wellsite automation, fuel delivery services, crop/irrigation monitoring, asset tracking, building controls, retail systems, car sharing, electric vehicle charging, solar panel monitoring, patient monitoring, elderly care, bike tracking as well as wearable devices such as fitness trackers and smartwatches.

Figure 3: LPWA Targeted Markets

In this report we analyze the market opportunity, competitive threats and status of LPWA network rollouts, commercial deployments and applications based on 250 interviews by phone and online surveys. It includes market size forecasts (2016-2022) for connected devices, annual unit shipments and breakdowns by market, application, technology, geography and equipment/services; the results from several surveys; an in-depth technology evaluation; and an in-depth analysis of 100+ companies in the rapidly expanding LPWA ecosystem.

Methodology/Scope

This report covers the global market opportunity for LPWA IoT networks, systems, chips/modules and services. In addition, we include the total addressable market for connected wireless sensing, tracking and control devices for each market segment (LPWA and others). Our methodology uses extensive primary research with hundreds of individuals across the whole LPWA/IoT value chain, an in-depth technology evaluation, analysis of 80+ markets/applications and a competitive analysis of 100+ companies. The major components of our research include the following:

Data Collection/Investigation:

- 250+ surveys/phone interviews with IoT professionals, network operators, platform providers, equipment manufacturers, component suppliers and other experts.
- Analysis of hundreds of financial, industry and technical reports.

Segmentation:

Geographies:	North America, Western Europe, Asia Pacific and Rest of World
Markets segments:	Utilities; Smart Cities; Industrial (Manufacturing, Oil and gas, Electric power, Water/wastewater, Construction/others), Agriculture and Logistics; Smart Buildings, Consumer and Others
Applications:	Energy/Metering, Lighting Controls, Safety/Security, Condition Monitoring, Smart tags/Asset tracking, Others
Product segments:	Equipment (End nodes, base stations and associated software) and services (installation, maintenance, connectivity and value-added services)

Competitive Forces & Technology Dynamics:

- Product segmentation, value chain and business model analysis
- Distribution channels, product availability and vendor strength
- Standards developments, technology adoption and emerging technologies
- Analysis of 100+ companies (offerings, pricing, partners, financials and potential for disruption/sustainability)

Market Size Forecasts:

- **Market data:** Recent data is collected from vendors, suppliers and end users on unit sales, growth trends, applications, hardware/service pricing, distribution channels, etc.
- **Market drivers:** Analysis of the weighted driver impact for each solution/market.
- **Projections:** Using all the above, we create data models from a moderate and aggressive viewpoint. Breakdowns are by target market, application, product segment, geography and technology. Revenues are for end nodes, network equipment and services.
- **Verification:** Forecasts are benchmarked with secondary sources and verified with market leading vendors and industry experts.



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