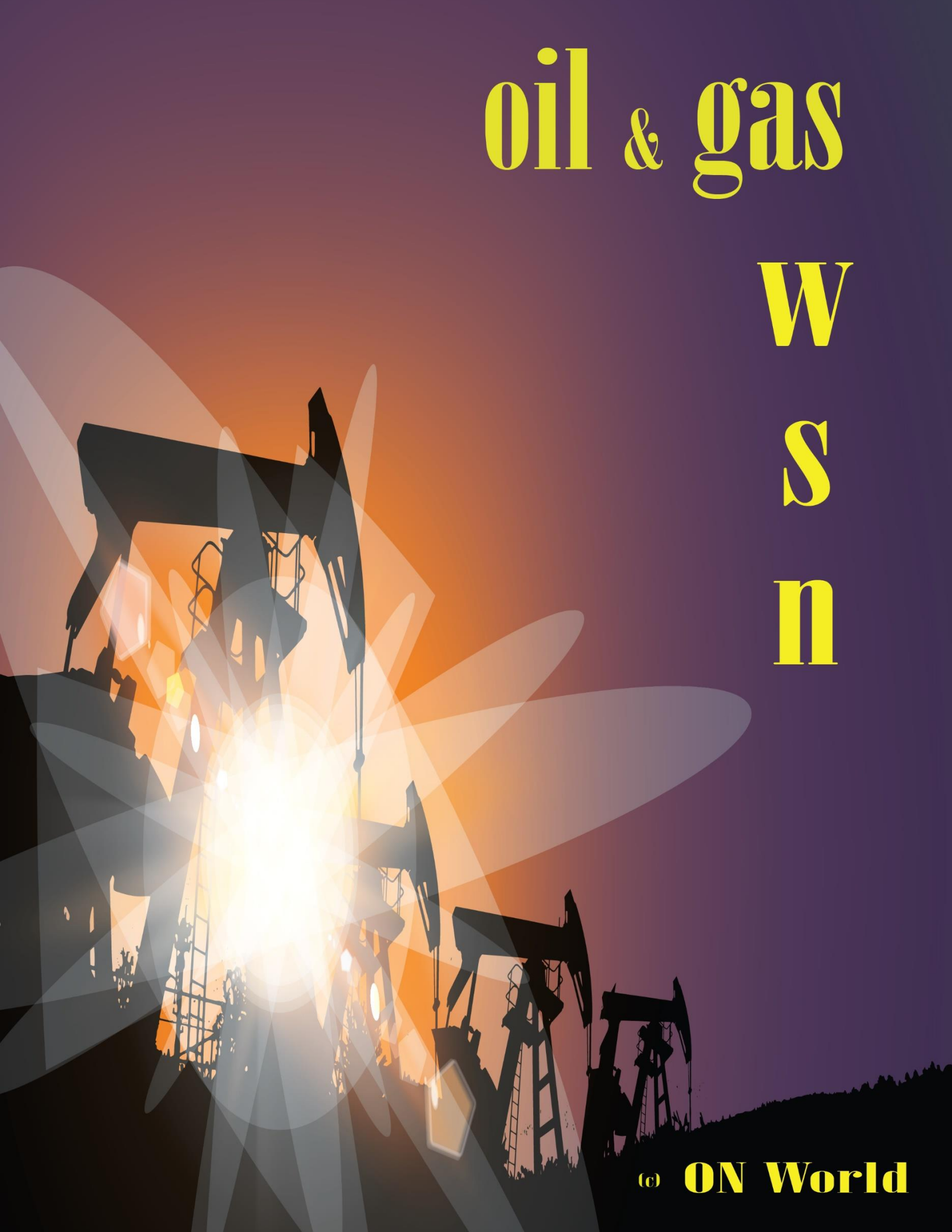
oil & gas wsn



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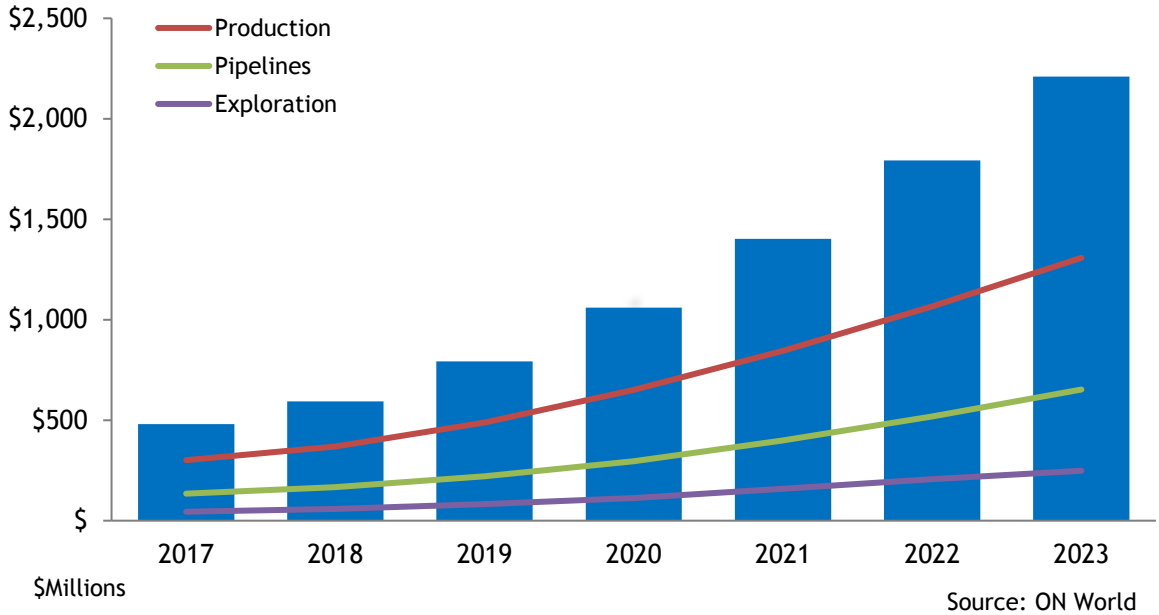
Executive Summary

For the past decade, wireless sensor networks (WSN) have connected stranded assets, streamlined operations and reduced deployment costs for the oil and gas industry. WSNs have enabled remote monitoring from offshore platforms, battery-less sensors in Arctic oilfields, pipeline leak monitoring in South Africa, wireless seismic sensors and continuous monitoring for stripper wells. Oil and gas WSN advances continue today with multiprotocol wireless mesh devices, passive sensors, wireless MEMs and Low Power Wide Area (LPWA) networks that provide a new generation of solutions for connecting assets in remote locations as well as enabling exploration projects to go deeper in challenging environments.

Operating on increasingly thin margins and focused on maximizing output from existing resources, oil and gas companies are adopting wireless sensor instruments that provide up to 80% infrastructure savings compared with wired options. As oil prices continue to rise and exploration activity increases, WSN adoption is steadily growing for core applications such as wellhead automation and pipeline compressor/pump station monitoring as well as growing innovations for asset management, worker safety and environmental monitoring.

In 2023, global WSN revenues for oil and gas exploration, production and pipeline operation will reach $2.2 billion up from $480 million in 2017. Production will make up 59% of the revenues by this time, including wellhead automation, asset/equipment monitoring, asset tracking and locating, as well as safety and environmental applications.

Figure 1: Global Oil & Gas WSN Revenues (2017-2023)



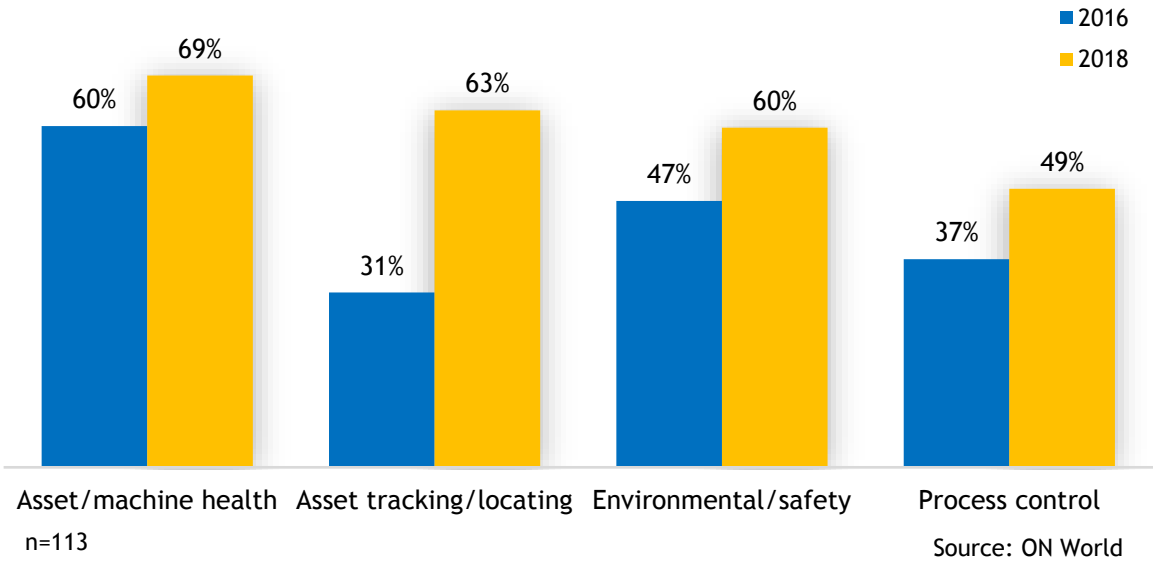
Source: ON World

ON World's Q2 2018 survey of 159 industrial automation professionals found that 43% are targeting oil and gas applications. Two in five of the oil and gas respondents have installed over 1,000 WSN nodes across all locations. Twenty percent (20%) have deployed networks with at least 3,000 nodes compared with 6% in our previous survey in Q4 2016.

Focus on Asset Management, Safety and Environmental Monitoring

The survey found that the fastest growing WSN applications by oil and gas respondents are asset tracking and locating, process control, environmental/safety and asset/machine health monitoring.

Figure 2: Oil & Gas - (Select) Planned WSN Applications Over the Last 2 Years



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Source: ON World

Wireless gas detection is an increasingly popular safety application with several products available today including ISA100 Wireless compliant devices by GasSecure (Dräger), New Cosmos Electric, Riken Keiki as well as WirelessHART devices by Emerson and United Electric Controls. RAE Systems (Honeywell) provides a multi-radio wireless gas detector that includes wireless mesh, WiFi and Bluetooth Low Energy (BLE).

Other innovations include a wireless mesh wearables worker safety platform by Scandinavian Reach Technology (SRT) that provides real-time location information about assets and personnel.
For the past decade, Kongsberg Maritime has been using SENSeOR's wireless passive SAW sensors for continuous temperature monitoring of bearings and other moving parts from offshore platforms and shipping tanker engines with over 80,000 devices installed to date.

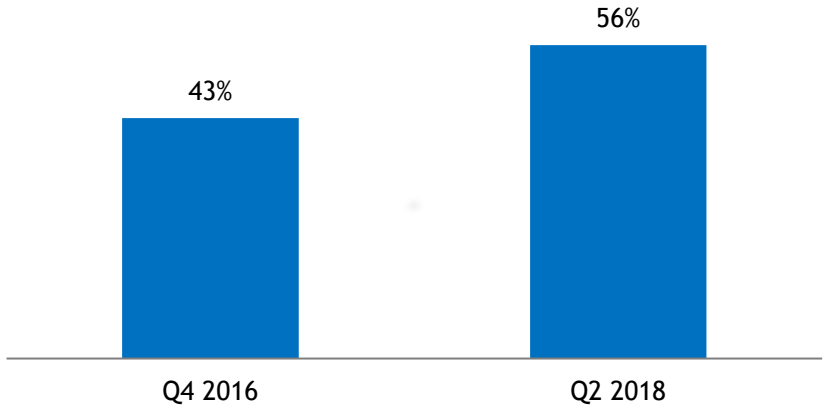
Steady Migration to Wireless Mesh Standards

Illustrated by ABB's WirelessHART network deployed on the Goliat FPSO (floating production storage and offloading vessel) in the Barents Sea, applications for wireless mesh sensor networks continues to grow. Our survey found that 56% of the oil and gas respondents are using WirelessHART and/or ISA100. However, uses for Bluetooth, WiFi and Low Power Wide Area (LPWA) technologies such as LoRaWAN™ , NB-IoT, LTE-M and Sigfox have increased faster.

Growing Adoption for LPWA Technologies

LPWA technology is one of the most disruptive technologies for the Internet of Things with low-cost, multi-year battery-powered wireless sensors that communicate over multiple miles and scale to thousands of devices per gateway. LPWA solutions are especially suited for oil and gas remote monitoring and asset tracking/locating applications that are not being addressed because of 1) Limited network range, 2) Poor structural penetration, 3) High costs and 4) Complexity.

Figure 3: Oil & Gas – LPWA Adoption Over the Last 2 Years



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Source: ON World

Over half are researching, pilot testing or using LPWA technologies today compared with 43% in our previous survey.

A few of the oil and gas LPWA products and platforms that have emerged over the past two years include the following:

- OleumTech's line of Sigfox sensor instruments including Class 1, Division 1 options
- Zedi's LoRaWAN™ IIoT field gateways and devices in partnership with MultiTech
- WellAware's RPMA edge devices and cloud platform
- WESROC's remote monitoring solution for fuel/lube/propane distributors using Senet's LoRaWAN™ network

ON World has been researching oil and gas IoT and wireless sensor networks for the past 15 years and this report is the 6th edition on this subject.

Methodology/Scope

This report covers the global market opportunity for oil and gas wireless sensor networking including wireless field instrumentation, associated software and services. Our methodology emphasizes primary research with hundreds of individuals across the whole oil and gas value chain, an in-depth technology evaluation, weighted market drivers and a competitive analysis of 90+ companies. The major components of our research include the following:

Data Collection/Investigation:

- 100+ surveys/phone interviews with professionals representing oil and gas companies, services companies, automation vendors, software platforms, systems integrators and component suppliers.
- Extensive analysis of financial, industry and technical reports.

Segmentation:

Geographies:	North America, Western Europe, Asia Pacific and Rest of World
Markets segments:	Exploration, Production, Pipelines
Solutions:	Process monitoring and control; Machine health; Corrosion monitoring; Other asset monitoring; Asset tracking and location; Health, safety and environmental monitoring; Seismic sensing
Product segments:	WSN equipment (End nodes, repeaters, gateways and associated software) and services (installation, maintenance and hosted/Web 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
- Evaluation of 90+ companies and their offerings, pricing, partners, financials and potential for disruption

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 provided by target market, application, product segment, geography and technology. Revenues are for equipment and associated software/services.
- **Verification:** Forecasts are benchmarked with secondary sources and verified with market leading vendors and industry experts.

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ON World provides business intelligence on Internet of Things markets. Since 2003, our market research has been used by Fortune 1000 companies, investors and IoT developers worldwide.

If you have any questions on the report, please call us or send us an email at: research@onworld.com