Frost Radar™

Frost Radar™ on the Global Smart Water Metering Market

A Benchmarking System to Spark Companies to Action - Innovation that Fuels New Deal Flow and Growth Pipelines

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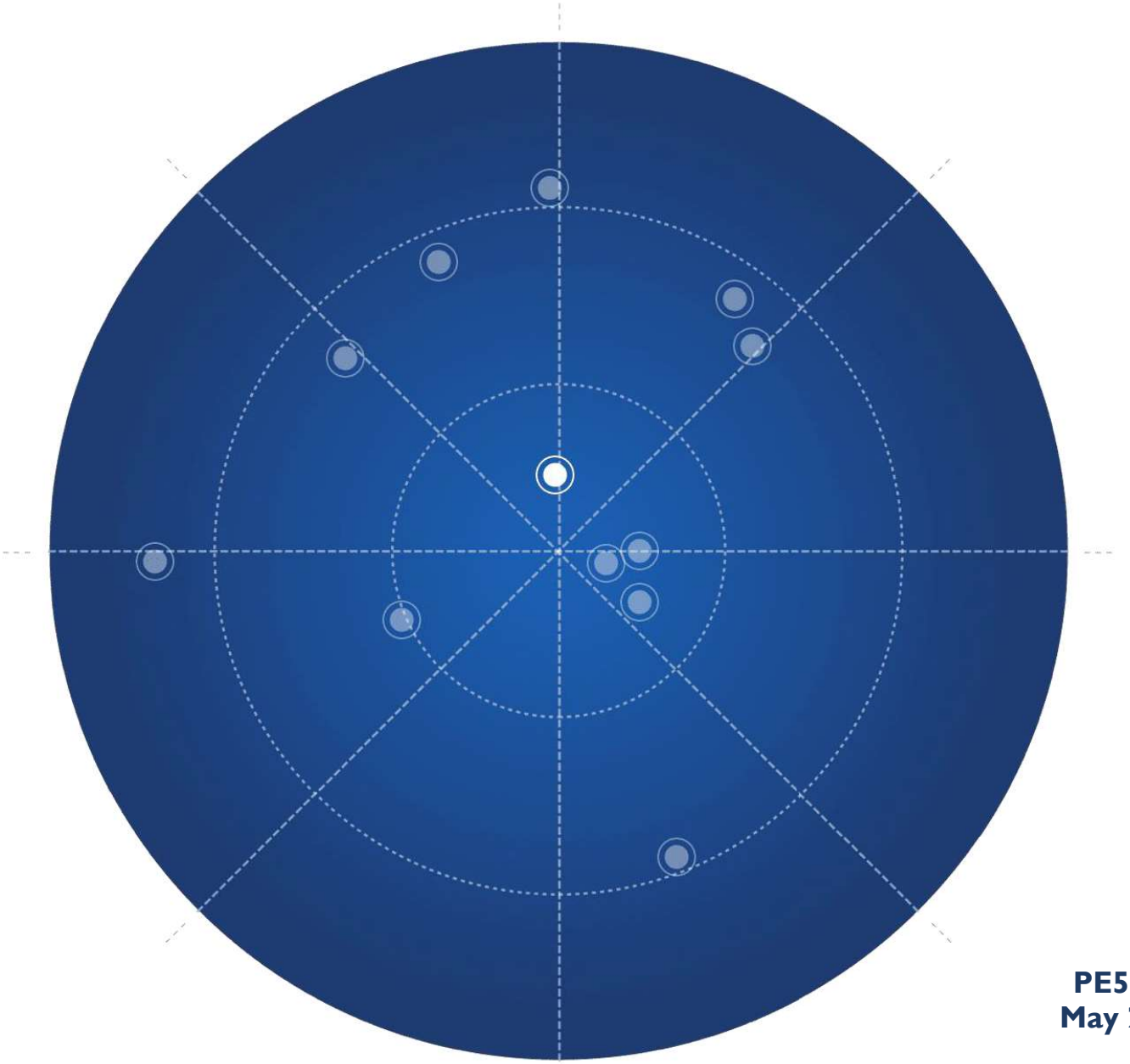

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Frost Radar™ Summary

Smart water metering solutions consist of water meters, communication modules, data communication networks, and meter data management (MDM) systems (including machine learning/artificial intelligence [ML/AI] data analytics, enterprise data management platforms, and cloud-based data management solutions).

Water meters are metrological devices capable of measuring water consumption. They can be mechanical (e.g., multi-jet, single et, positive displacement, nutating disc) or static (electromagnetic or ultrasonic).

The communication module conveys meter data to the utility either through an automated meter reading (AMR) module or an automated metering infrastructure (AMI) module.

- The AMR module is capable of one-way communication (i.e., meter to data collector device). A smart water meter with an AMR could constitute a mobile network (wherein a data reader affixed to a vehicle or in a utility worker's possession reads meter data as it passes by) or in some cases a fixed network in which data concentrators collect data and transmit it to a utility's centralized server via an Ethernet or Wi-Fi backhaul. Pulse radio frequency (RF) and wireless Modbus (W MBus) are the most common AMR communication networks.
- The AMI module constitutes a fixed network and has an ability to communicate two ways (i.e., meter to utility and utility tometer). AMI usually leverages a low-power wide area network (LPWAN) to communicate meter data to a concentrator and then through Ethernet backhaul to the utility's server or directly to a telecom tower (for cellular LPWAN). It is then sent to the utility's head end system for visualization and analytics. The key advantages of AMI communication modules are automated data collection, over-the-air firmware updates, remote meter shutoff, leak monitoring and detection, and near-real-time data visualization.

Communication networks including W MBus and LPWAN such as LoRa, SigFox, WIZE, and Wi Sun transmit data on unlicensed spectrum. Cellular LPWAN (NB IoT and LTE-M) and Sensus FlexNet use licensed spectrum usually owned by telecommunication companies. 2G/3G/4G/5G telecommunication networks are rarely used because the relative battery consumption for data transmission is higher than in devices with LPWAN or W MBus based communication modules.

MDM systems are the key head end systems that utilities use to collect, collate, validate, and visualize meter data used to create water bills, analyze demand, optimize resources, monitor and detect leaks/theft or pipe breaks, and comprehensively improve efficiency of the water network operation.

The Frost Radar™ for smart water metering covers notable providers of some or all of these solutions. End customers include water utilities, residential (submetering or stand-alone metering of residential complexes), commercial establishments, and industries.

Market Phase	Base Year	Radar Type
Growth Phase	2022	Industry

Market Analysis

Research Summary

Water stress caused by droughts, overexploitation of existing water resources, and the rapid pace of urbanization has caused utilities worldwide to explore smart water metering solutions. New investment in smart water metering is mainly driven by water conservation policies and the need to reduce non-revenue water (NRW), which has the potential to improve the long-term sustainability of water supply infrastructure.

Water meter manufacturers, system integrators that offer end-to-end metering solutions, and internet of things (IoT) solution providers collaborate on multiple levels to develop smart systems. Strategic partnerships or mergers and acquisitions (M&A) allow manufacturers and system integrators to expand their product and solution portfolios and offer utility customers IoT connectivity that can support AMI and advanced ML embedded data analytics platforms that can monitor leaks, track consumption patterns, and optimize the system.

Leading companies are offering solutions that cover the entire water network with IoT-based online sensors that monitor quantity (pressure, flow, temperature, acoustics) and quality parameters (e.g., pH, TDS) that complement the smart meter and can leverage the IoT network the meter uses to transfer data.

From more than 100 smart water meter solution providers globally, Frost & Sullivan has identified 21 as leaders in the industry. Most are active in the hot spots of North America and Europe. A local presence or partnerships with regional players are important to make inroads in high-potential markets including China; Southeast Asian (SEA) countries Vietnam, Indonesia, the Philippines, and Malaysia; India; Brazil; South Africa; Australia and New Zealand; and Gulf Cooperation Council (GCC) countries. Most Tier 1 (through channel partners or distributors) and Tier 2 companies are pursuing new growth opportunities in these locations.

Growth over the last three years, innovative technology and its acceptance in the industry, innovative business models and their effect on growth, and value offered to customers in terms of sustainability and resilience are among the factors considered in each company's placement on the Frost Radar™.

Strategic Imperative

Frost & Sullivan has identified eight Strategic Imperatives that are creating pressure on growth: Transformative Mega Trends, Customer Value Chain Compression, Innovative Business Models, Internal Challenges, Industry Convergence, Competitive Intensity, Disruptive Technologies, and Geopolitical Chaos. The three that are most influential on smart water metering solutions are Transformative Mega Trends, Industry Convergence, and Disruptive Technologies.

Climate change-induced droughts and water stress caused by overexploitation have caused utilities across the globe to explore economical and environmentally sustainable solutions to mitigate water stress and ensure conservation. Smart water meters have become a front-line tool to ensure efficient use of precious water resources and are a component of smart city development.

Water conservation is a key part of the circular economy and utilities' net zero polices. NRW loss affects revenue and the environment, so utilities are exploring a broad range of smart water metering solutions to meet net zero targets.

Water utilities have reached a critical phase of the need to improve operational efficiency while facing skilled labor shortages and disruptive weather events. Most utilities are facing challenges keeping up with quality service requirements and in some cases are unable to recoup the money needed to maintain assets or water service. Most are embracing digital transformation to improve customer engagement and adequately manage assets.

The industry is witnessing a convergence of multiple solution providers that offer smart water network monitoring and management solutions needed for an integrated smart water grid. Water distribution networks require continuous monitoring of water quality and quantity parameters. Smart water meter solution providers through strategic M&A or partnerships are consolidating pressure management, acoustic leak detection, level monitoring, and water quality monitoring solutions and are positioning themselves as one-stop shops for smart water network management solutions.

IoT connectivity is disrupting metering architecture. LPWAN solutions such as LoRa, NB IoT, and LTE-M will replace conventional or proprietary WAN-based communication solutions as customers demand products empowered with IoT and two-way communication (i.e., AMI). Demand for AMR solutions will decline. The preference for AMI is because of utilities' need for improving operational efficiency by minimizing truck rollout and its ability to prioritize utility resources toward the most critical event.

Based on the robust availability of meter data, AI/ML-based solutions will further streamline utility operations, be able to identify theft and quality-disrupting events, and reduce or minimize downtime—especially during peak hours.

Growth Environment

Frost & Sullivan estimates that smart water meter sales for 2023 will reach 41.9 million units and increase to 58.1 million by 2026. Projected revenue of $5.2 billion in 2023 is forecasted to reach $7.3 billion by 2026.

North America and Europe are the main markets. Most utilities in these regions have relatively well-established district metered areas. Growth will be propelled by utilities transitioning from AMR to AMI or mechanical meters to AMI-based smart water meters as part of a digital transformation on the back of sustainability, water conservation, or net zero goals.

In the Asia-Pacific (APAC) region, China leads in demand, with local players satisfying most of it. Australia-New Zealand, SEA countries, and India will be growth hot spots in the next 5 to 10 years.

The dominant communication networks for smart water metering are set to become cellular LTE-M and LoRa in North America and LoRa and NB IoT in APAC, Europe, and the Middle East.

India, Brazil, South Africa, and SEA countries are leapfrogging in terms of technology adoption, with most utility customers specifying the need for an end-to-end solution giving rise to growth opportunities for network, software, or data as a service (NaaS, SaaS, and DaaS) business models.

Metering as a service is becoming more common in North America. This model could prove highly effective for price-sensitive Latin American and APAC water utilities.

Europe is a growing hot spot for smart multi-utility (power, gas, heat, and water) schemes for the development of smart utility grids as a part of smart city investment. This is creating new opportunities for comprehensive solution providers.