

Smart Electricity Metering Industry

Core Enabler of the Digital Energy Revolution

KEY 2025 HIGHLIGHTS

AI-Driven, Edge-Enabled, and Decentralized Smart Grid Solutions

Smart meter rollouts are accelerating grid and city modernization, leveraging edge computing and AI for real-time analysis, predictive maintenance, and demand forecasting. Decentralized digital solutions now combine renewable integration and cloud intelligence, empowering both utilities and consumers with instant optimization and personalized insights.

1

Renewable Integration and Zero-Energy Building Adoption

AMI has become a necessity, rather than an option, that extends beyond traditional billing support to dynamic use cases such as net metering, solar PV management, and electric vehicle integration. More zero-energy buildings and flexible service models will emerge, accelerating sustainability goals and boosting renewable energy adoption.

2

Network-as-a-Service and Managed Smart Metering

Utilities and service providers are adopting smart metering platforms offering network as a service and AI-driven insights, enabling real-time monitoring, predictive maintenance, and grid-edge intelligence for improved customer engagement and operational efficiency.

3

Accelerated rollouts will be key

Emerging markets in Asia, Africa, and Latin America are rapidly ramping up smart meter adoption, driven by government incentives and tech leapfrogging, with global shipments set to reach 181 million units by 2025. In parallel, large-scale second-generation rollouts continue throughout North America, Europe, China, Japan, and South Korea, sustaining advanced deployment through the decade and beyond.

4

Advanced Cellular redefines deployment possibilities

Comms will be dominated by three core technologies - powerline, RF Mesh and NB-IoT/LTE Cat-M. Advanced cellular solutions (NB-IoT, LTE Cat-M) are gaining ground in new deployments, with the potential to shape the future landscape as technology and market needs evolve.

5

KEY INDUSTRY TRENDS

Innovation Ahead



Demand for second-generation metering evolving in matured markets, such as in Europe and North America

Evolving Use Cases



Grid level use cases to become more popular amidst greater need for customer analytics and billing

Metering Service



Smart metering business models transitioning from CAPEX to OPEX oriented to drive greater need for managed services

Grid Reliability and Resiliency



AI as a service to be crucial for behind-the-meter and in-front-of-the-meter applications

Disruptive Technologies



Potential for advanced cellular (NB-IoT and LTE Cat-M) to be a game changer, especially where traditional cellular prevails

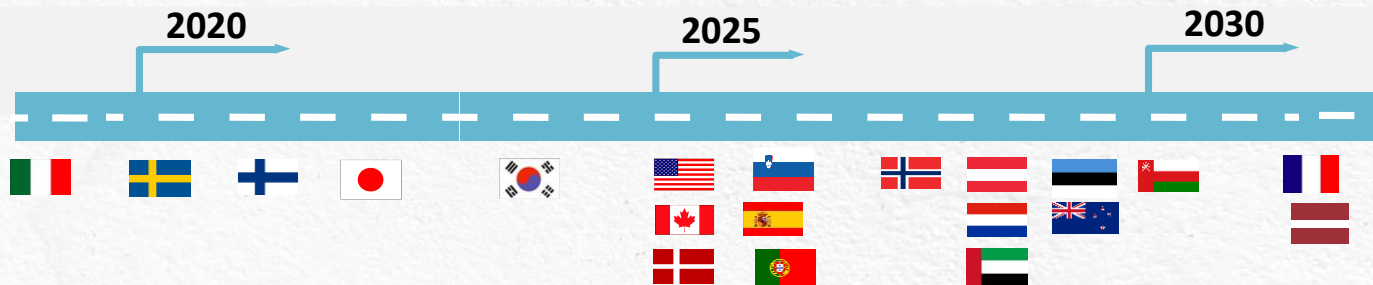
Prosumer Service Monetisation



Smart meters to reshape customer relationships and utilities with customised services to develop greater prosumerism

SECOND-GENERATION SMART METERING: GLOBAL ROLLOUT ROADMAP

As first-wave deployments conclude, countries across Europe, North America, East Asia, and the Middle East enter the new wave of rollouts—driven by technology upgrades, replacements, and expanding grid intelligence.



NORTH AMERICA

- Second-generation smart electricity metering in North America is expected to begin in earnest in 2026, with early activity already underway through replacements and pilot projects in both the US and Canada.

EUROPE

- France, Slovenia, Spain, Norway, Estonia, Netherlands, Italy, Sweden, Denmark, and Finland have all completed their smart meter rollouts.
- Second-generation smart electricity metering has begun by the early adopters—Italy and Sweden started in 2020, followed by Finland in 2022, Denmark in 2025. Slovenia, Spain, Norway, Austria, Netherlands and Estonia will begin their second-waves later in the decade.

EAST ASIA

- Japan completed its first rollout in 2023 and immediately began second-gen installations, while South Korea, midway through its first-gen rollout, has accelerated its second-gen deployment starting in 2024.

ANZ

- Second-generation smart electricity metering will be seen in New Zealand starting from 2029, due to the meter-life longevity, with steady increase in the meter shipments

UAE

- 2026 marks the key transition year, with second wave tenders and deployments gaining pace—led by major utilities like ADWEA and DEWA, with rollouts expected post-2028.

TRENDS IN MANAGED SERVICES

Evolving Business Models

Evolving Business Models				
On-premises		SM/SaaS and IaaS		OaaS
Current Model		Evolving Model		
Till 2025		Beyond 2025		
Traditionally Adopted		Likely Adopted		Possibly Adopted
Value Chain		MaaS/SaaS	IaaS	OaaS
	Project Management	O	O ✓	O
	HES and MDM Software	✓	✓	✓
	Communication Infrastructure	✓	✓	✓
	Metering Device	O ✓	O ✓	O
	Installation	O	✓	O
	Operations	O ✓	O ✓	O ✓
	Analytics and Cybersecurity	—	—	✓
Objective of As-a-Service Model		Improved operational efficiency	Supplement revenue generation	New streams of revenue generation

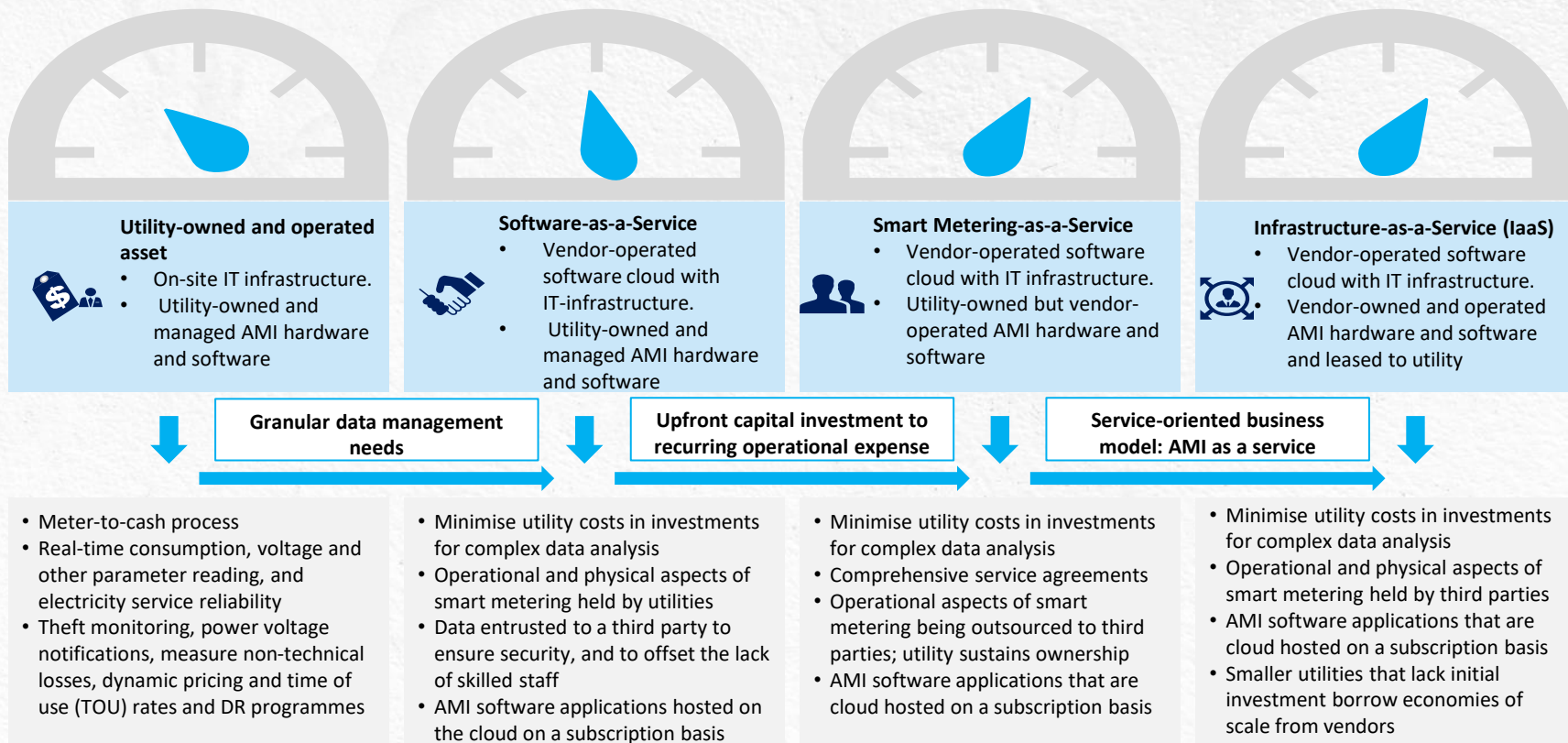
The differentiation through outcome-based solutions backed by various offerings as-a-service will be the key to demonstrate greater value and generate the next repeatable lucrative revenue stream for companies.

Note: O denotes outsourced; ✓ denotes part of value proposition

HES—head end system; MDM—meter data management; SM—Smart Meter

EVOLVING SMART METERING BUSINESS MODELS

Complex data management drives utilities to adopt new business models of smart meter use, delivery, and ownership with service-based offerings.



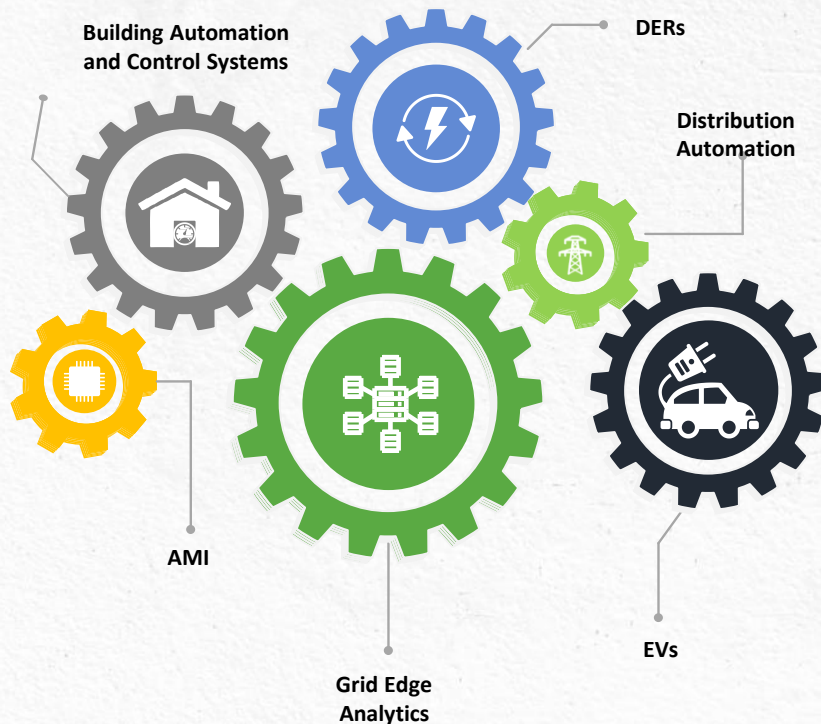
SMART METERING ANALYTICS FOR EDGE INTELLIGENCE

Meter Analytics for Improving Transmission and Distribution (T&D) Asset Optimisation and to Offer Better Customer Experience

	 Metering Analytics	 T&D Analytics	 Customer Analytics
Predictive	Rate Development	Grid Reliability Analytics Outage Analytics Network Analytics Load Forecasting EV Planning	Behavioural Analytics Pricing Optimisation Tariff Modelling Program Customer Targeting Risk Analytics
Diagnostic	New Meter Health Unbilled Sales Reporting Deployment Data Quality Operational Analytics	Volt/VAR Analytics Fault Optimisation Power Quality Optimisation Plant Optimisation RE/DER Optimisation	Account Billing Prioritisation Customer Segmentation Lifetime Value Analytics
Descriptive	Geospatial Reporting Inventory Tracking Meter Tampering/Theft Identification	Network Monitoring Field Crew Performance Asset Performance/Health Monitoring	Billing Analytics Credit and Collections Energy Efficiency Regulatory Compliance

SMART METERING ANALYTICS FOR EDGE INTELLIGENCE (CONTINUED)

Smart meters play a key role in the effective implementation of grid edge analytics



- 1 Smart meters compliment and connect with external applications such as EV, DER, building automation systems, and distribution automation.
- 2 Data from smart meters will result in effective and insightful grid edge analytics.
- 3 Meters are becoming smarter and are being amended with additional complex features such as hybrid communication and signal processing, and greater computing capabilities.
- 4 They help utilities beyond billing, and even support asset management and electricity network management of devices.

POTENTIAL TECHNOLOGIES OF THE FUTURE—LPWAN

NB-IoT and LTE-M have become key cellular LPWAN choices for electricity metering in Europe, China, India, and North America, with Cat-M1 (LTE-M) often preferred for high-speed, low latency, frequent data transmission, strong signal, higher device density and NB-IoT for deep indoor, cost-sensitive, or static meters.

Total Smart Electricity Meter Market: LPWAN Technologies, Global, 2025

*LPWAN

Parameters	LoRa	SigFox	NB IoT	LTE M
 Radio Frequency	868 MHz (EU) 915 MHz (USA) ISM Band	868 MHz (EU) 902 MHz (USA) ISM Band	700 MHz, 800MHz, and 900 MHz	700MHz, 800MHz, and 900 MHz
 Speed	0.3 Kbps to 50 Kbps	100 bps	<150 Kbps	1 Mbps
 Communication Standard	Proprietary to SEMTECH	SigFox network	Compatible with GSM and LTE network (3G PP standard)	Release 13 of 3G PP standard
 Battery Life	10 Years	10 Years	10–15 Years	5–10 Years
 Leading Players	LoRa Alliance, Semtech, ZTE, Proximus, Orange, KPN, and Softbank.	SigFox	Telia, China Mobile, Vodafone, Huawei, Proximus, Xemex, MTN, ZTE, Nokia, Orange, Ericsson, Deutsche Telekom	Orange, Telit, Verizon, AT&T



Other Key Proprietary LPWAN Technologies:

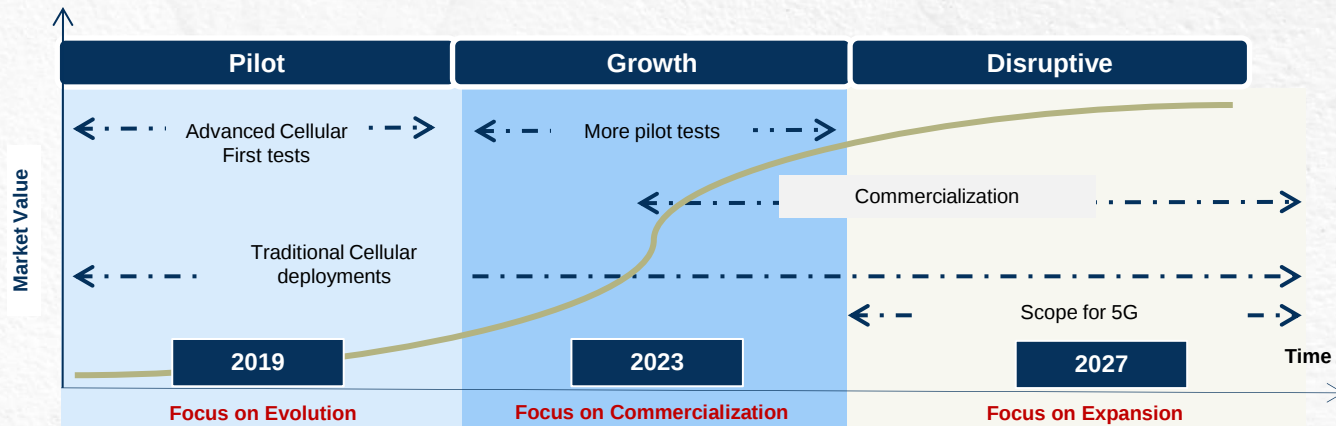
Itron—Open Way Riva™ Adaptive Communication Technology (ACT)

Sagemcom Siconia™ Low Power Wide Area Network (LPWAN) IoT portfolio of LoRaWAN™ solutions

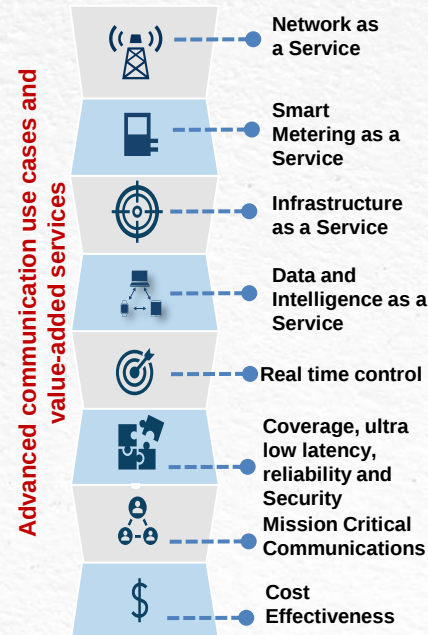
*LPWAN—Low Power Wide Area Network

POTENTIAL TECHNOLOGIES OF THE FUTURE—ADVANCED CELLULAR

Emerging smart metering technologies include hybrid and advanced cellular solutions, with 5G enabling real-time grid control. LPWAN remains essential for rural and hard-to-reach areas due to its power efficiency and long-range capability, and NB-IoT and LTE-M are now supported by 5G networks



- Major NB-IoT and LTE-M deployments have accelerated since 2023, with utilities in India, Europe, and North America rolling out millions of smart electricity meters based on cellular IoT connectivity.
- NB-IoT technologies with cost and coverage benefits are also likely to feature strongly in the future of smart metering in India and South Asia, Australia and New Zealand, the Middle East and North Africa, and Sub-Saharan Africa, where NB-IoT/LTE Cat-M comms technologies are set to dominate. Powerline comms dominates in Europe, a preferred technology in France and Italy, but by the end of the decade, NB-IoT/LTE Cat-M will have edged ahead to be the leading comms technology in Europe with key pockets being Benelux, Eastern Europe, Nordics, UK and Turkey.
- NB-IoT and LTE CAT-M technologies will increase penetration, based on the proven pilot's success. However, there is no one-stop solution, and the communications uptake post 2025 will be on a scale larger than before.
- Utilities use 5G for edge analytics and control, but rely on LPWAN for widespread, always-on meter connectivity. NB-IoT and LTE-M operate seamlessly on 5G infrastructure for traditional metering deployments.



SMART METERS AS GRID INTELLIGENT DEVICES

Integral Asset to Grid Intelligence

- Higher visibility gained by utilities to proactively solve grid-related problems through proactive grid management
- No more mere billing sensors; rather use of smart meters to unlock value at a grid-management level to reduce faults and network outages, and locally foresee and forecast energy consumption

Data Analytics and IoT to Embed Cognitive Capabilities in Meters

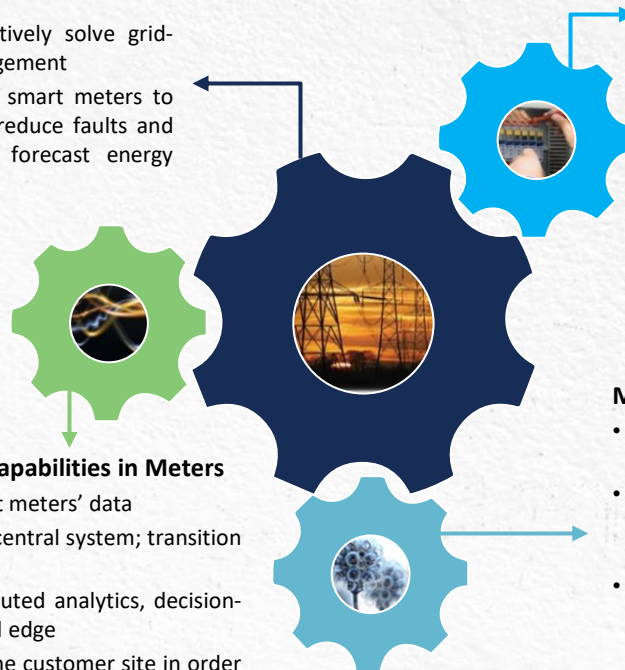
Managing and extracting the real value from smart meters' data
Processing data at the edge and sending it to the central system; transition now from descriptive meter analytics to predictive
Smart meters being used as platforms for distributed analytics, decision-making, and for device communications at the grid edge
Predicting the behaviour of energy resources at the customer site in order to efficiently utilise the resources

Product to Service Solutions

- Smart demand response (DR) solutions direct energy companies to offer services to enable customers to save energy and money by changing the way they consume energy
- Changing business models for both utilities and manufacturers, to incorporate metering-as-a-service platforms to leverage on distributed intelligence and unlock opportunities from metering as a smart sensor in the IoT network

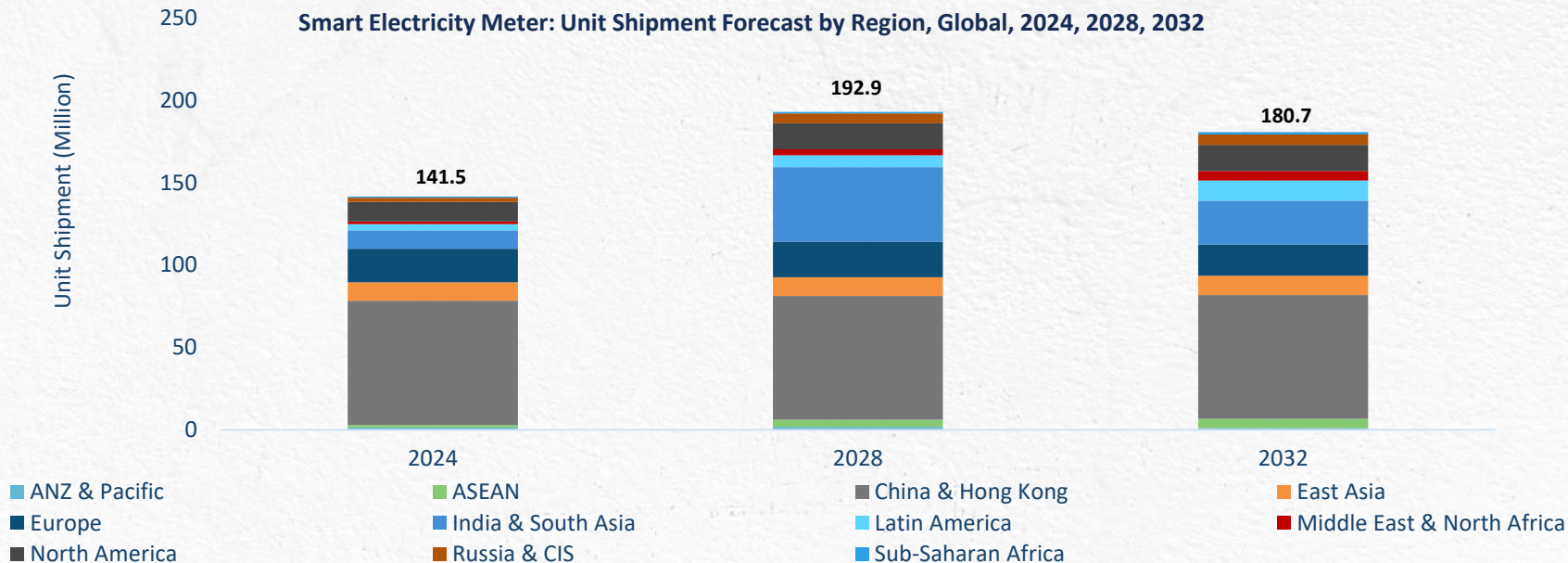
Metering Analytics Benefits Utilities and Prosumers

- Metering intelligence supports grid management, distributed energy resource (DER) integration, end-consumer insights and engagement
- A communication hub for billing analytics, connect power inverters or EV chargers, connect and disconnect features for grid management optimisation
- Benefit for prosumers from energy efficiency and by saving money they spend in real time due to high electricity prices; demand greater visibility to control benefits and costs
- Utilities to provide customers the insights needed for individual grid management



MARKET GROWTH FORECAST

China will remain the largest contributor to global smart meter revenues, while strong growth in India & South Asia pushes it ahead of Europe and North America by mid-decade; both mature regions, however, continue to contribute steady, high-value volumes.

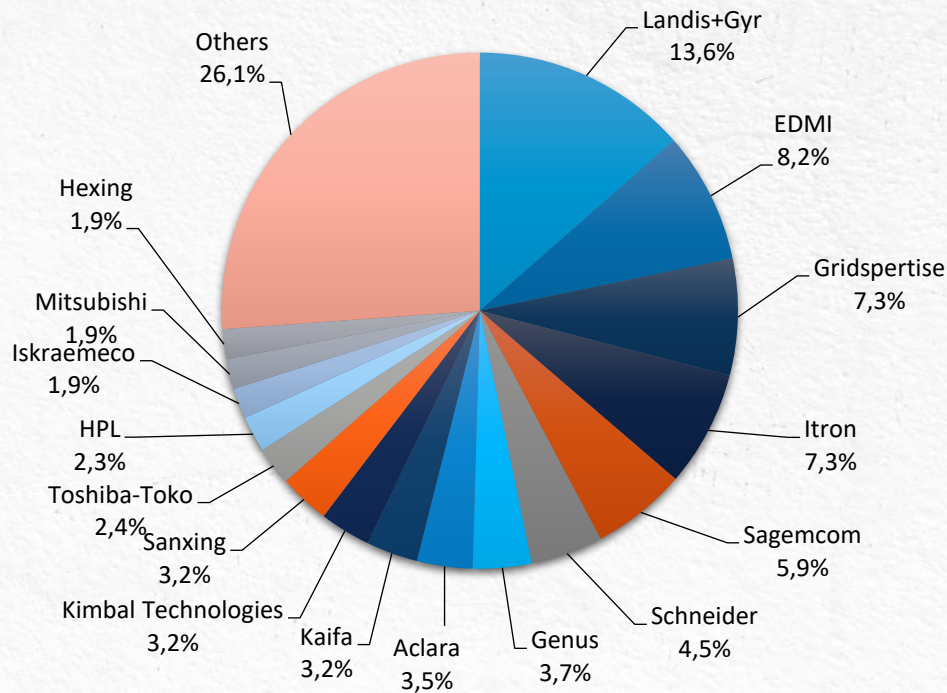


Global smart meter shipments are forecast to reach 180.7 million units by 2032, up from 141.5 million in 2024. China is the largest market as it replaces first-generation meters, but a wave of second-generation metering in the US, Canada, Japan, Italy, Nordics, Netherlands, Slovenia, and Spain will also drive growth. France, Austria, Ireland, Portugal and Saudi Arabia have all completed their rollouts. Bahrain, Kuwait, Australia Qatar, UAE, and Uzbekistan are amongst the countries that will complete by the end of the decade. Asia will see high growth, with Malaysia and Singapore having completed rollouts by the end of the decade and significant deployments in Indonesia, Taiwan, and the Philippines.

SMART METERING MARKET SHARE

Landis+Gyr is the leading company to feature among the top 16 participants. Challenge facing the companies is the competition from Chinese, typically in those markets that are price competitive.

Smart Electricity Meter Industry: Per Cent of Units by Top Participants, Global excluding China, 2024

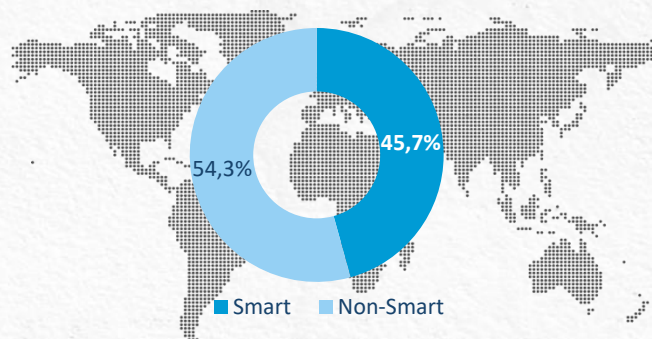


SMART METER INSTALLED LEVEL OF PENETRATION BY COUNTRY

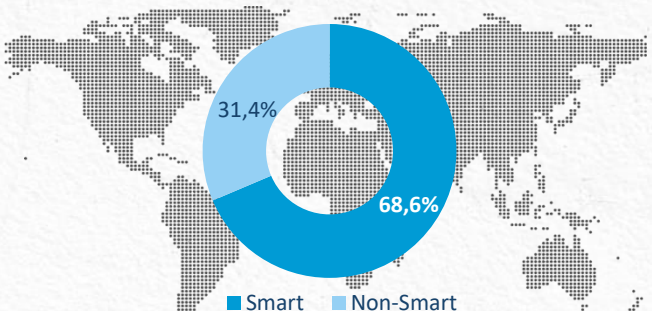
Global smart meter adoption is surging, with accelerated deployments set to push smart metering to cover more than half of all global electricity meters by 2032.

Smart Meter Penetration, Global, 2024 and 2032

2024



2032



FROST & SULLIVAN



0%-15%

European countries like Czechia, Hungary, and Greece are ramping up large-scale smart meter projects, with South America offering strong potential and Africa remaining mostly at pilot scale. By 2032, India, Greece, and Israel aim for over 90% penetration, while Czechia, Tunisia, and Brazil target above 50% and are gaining pace.



16%-30%

Key countries include Russia, South Africa, Taiwan, and Angola. By 2032, Russia will exceed 80% smart meter penetration. Taiwan targets 7 million meters by 2030, while South Africa's rollout is focused on prepayment and targeted utility projects.



31%-60%

Australia nears 60% penetration, aiming for full coverage by 2028. Kuwait and Oman target 100% by 2032. Malaysia and South Korea expect full deployment by 2030. Many European countries, including Belgium, Germany, and CEE nations, will surpass 50% penetration, with most reaching the highest band by 2032.



61%-80%

Singapore's smart meter rollout will finish by 2026 after delays. The UK aims for full coverage by 2030, with replacements rising after 2027. In the US, major utilities have already covered over 75% penetration, and further activity is expected from the community and municipal sectors.

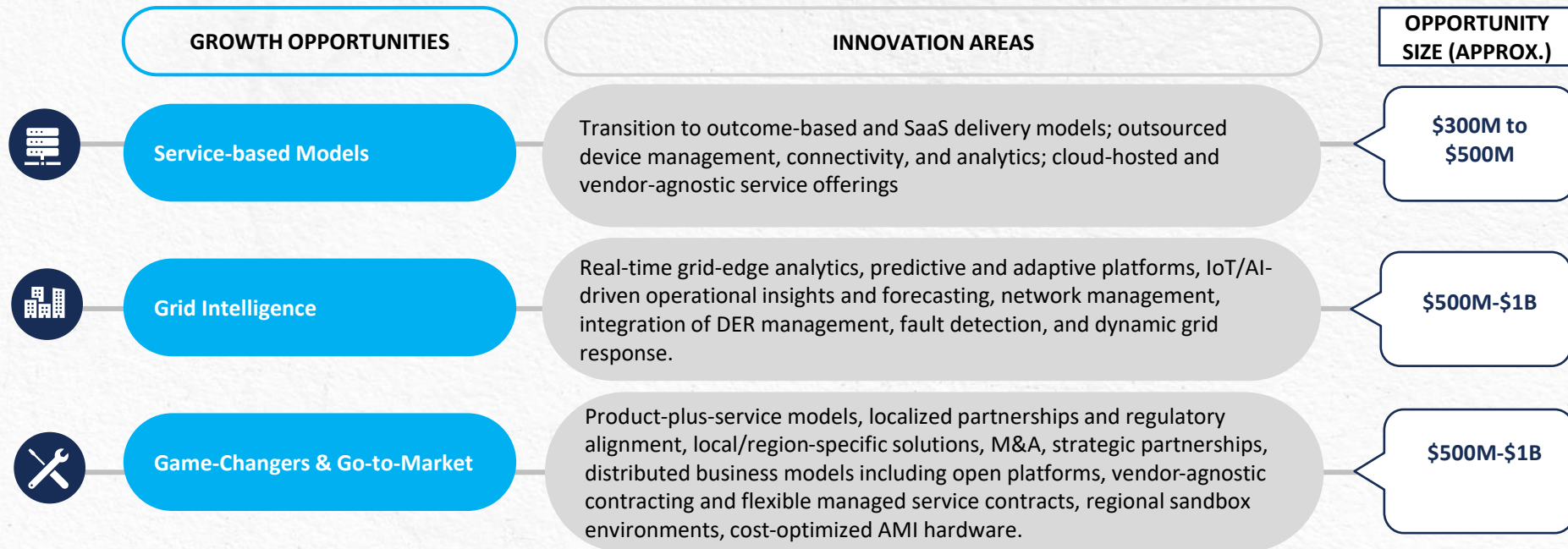


81%-100%

Italy, Sweden, Finland, New Zealand, Estonia, Spain, Norway, Denmark, and China reached 100% smart meter penetration early. Italy and the Nordics lead in second-generation rollouts, with countries like Slovenia, Spain, Norway, Austria, Netherlands, and Estonia following soon. New Zealand, France, Iberia, and Latvia have started replacements. Austria, Ireland, and Hong Kong will complete by 2026, while the UAE and Canada exceed 85%.

TOP SMART METERING GROWTH OPPORTUNITIES IN 2026

Global smart meter adoption is surging, with accelerated deployments set to push smart metering to cover more than half of all global electricity meters by 2032.



KEY TAKEAWAYS

Smart metering is evolving to be a pivotal part of the intelligent, interconnected, and consumer-focused ecosystem, reshaping the energy landscape through data-driven insights and customer empowerment, and transforming how energy is measured, managed, and monetized.



Smart Metering solutions to strengthen their value proposition through digital platforms and services, enabling recurring revenue through SaaS, MaaS, and IaaS models, and aligning with utility operational outcomes.



Sustainability and grid modernization are driving adoption, with smart meters supporting renewable integration, zero-energy buildings, and prosumer engagement.



Digitalization and edge intelligence unlock operational efficiency and customer insight, enabling predictive analytics, dynamic pricing, and real-time grid management. Retrofitting meters with secure modems bridges data gaps to deliver AI and renewable benefits without full replacement.



New business models and vendor-agnostic service offerings are expanding market reach, especially in emerging regions, with flexible managed services and outcome-based contracts.



Global smart meter rollouts are gaining momentum, driven by second-generation upgrades and rapid adoption in emerging regions. By 2032, shipments are expected to exceed 180 million units, reinforcing a global base of over 1.6 billion meters.



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