Advanced Metering Infrastructure (AMI) Market in Smart Grid for Electric Power, 2012 - Market Size, Vendor Landscape and Outlook to 2020

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Government Support and Focus on Energy Efficiency Drives the Market for Advanced Metering Infrastructure

The global market for AMI will be driven largely by the support provided by governments of different countries for the implementation of AMI technology and systems. Governments are slowly increasing their emphasis on energy efficiency in all sectors. An increased focus is now also being given to the energy efficiency of end-users. Smart meters play a vital role in enabling consumers to use less energy, thus reducing the need to invest in new generation sources. Smart meters and their associated accessories such as In Home Displays (IHDs) enable consumers to be aware of their energy usage in real-time and take appropriate action to reduce their usage. Those countries which are implementing smart meters have formulated new legislation that supports the deployment of the technology. Governments and utilities, such as the US government and South Korea’s utility KEPCO have introduced grants and funding for smart meter deployment, and these are expected to drive the market in the future.

China is Expected to Lead the Global Advanced Metering Infrastructure Market from 2015 Onwards

The US is the largest market for AMI at present, followed by China. The US accounts for nearly XX% of the global AMI market by revenue, whereas China presently accounts for around XX% of the global market. China is expected to take the lead in the global AMI market after 2014 as most of the US smart meter deployment is expected to be completed by then. China has emerged as a large market for the smart meter deployment. The large consumer base and the policy initiatives taken by the government towards grid modernization and smart metering is the major driver behind the annual growth rate of XX% of the smart meter market in China. The State Grid Corporation of China has also provided grants for the smart grid initiatives in the countries.

Increasing Smart Meter Deployment will Drive the Market for Meter Data Concentrators

The deployment of smart meters needs to be supported by Meter Data Concentrators (MDC) in the case of the Radio Frequency (RF) communication and Power Line Communication (PLC). Increasing installations of smart meters will increase the requirement for meter data concentrators. Most countries have opted for a PLC and RF mesh as the Local Area Network (LAN)/Neighborhood Area Network (NAN) communication technology for smart metering.

These XX technologies essentially require a meter data concentrator in order to collect data from meters and transfer it to the utility data center. In North America, RF and PLC are the most popular technologies for smart meter deployments. Nearly XX smart meters are being served by each data concentrator in North America. In Europe, as most utilities have adopted the PLC communication technology, the market for meter data concentrators in Europe has witnessed significant growth during the last three years.

PLC and RF Communication Technologies are Expected to Lead the Smart Meter Communication Infrastructure Market for LAN/NAN Communication

PLC and RF are the most commonly used communication technologies for LAN/NAN communication for AMI networks in Europe and North America. However, most of the utilities in these regions rely on cellular communication technology for the Wide Area Network (WAN) communication. In Europe, the pioneering countries in deploying AMI, such as Italy and Sweden, have opted for PLC communication technology as it is the most economical solution for countries with high population density. Ireland has also found the combination of PLC and RF the most economically feasible option in a cost-benefit analysis. China has selected PLC as the most reliable communication technology for its smart meter deployment, and South Korea is also expected to opt for PLC, however, Australia has chosen RF for most of its smart meters.

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Source: GlobalData, Primary Interviews with Marketing Managers, Economists and utility Executives from Advanced Metering Infrastructure Industry
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2 Introduction

Utilities around the world are moving towards reducing their dependency on fossil fuels in meeting the growing needs of consumers for power, and this has created market opportunities for smart grid technologies. Robust smart grid networks are needed to enable the widespread integration of distributed renewable energy generation sources such as solar and wind energy with the national grids of developed and developing nations. Smart grids are also required to increase efficiency in the generation, transmission and distribution of electricity. Advanced Metering Infrastructure (AMI) is one of the key smart grid technologies which are being adopted by various countries on a large scale. AMI enables consumers to track their energy usage in real-time and allows them to make decisions to use energy efficiently. The energy usage data from AMI meters helps utility companies to understand consumer energy usage patterns.

AMI technology consists of various components, such as smart meters, network infrastructure, Meter Data Management Systems (MDMS) and support systems such as home energy management software and In-Home Display (IHD) units. All of these components of AMI enable utility companies and consumers to conserve and use energy more efficiently.

2.1 Advantages of Advanced Metering Infrastructure over Automated Meter Reading

AMI can be considered as an advanced version of Automated Meter Reading (AMR). AMR has been used by utilities in various countries since the early 1990s, in order to remotely collect periodic readings from gas or electric meters. AMR systems are one-way systems, used to provide the collection of data on monthly or daily basis and are not capable of broadcasting control messages, unlike AMI systems.

Compared with AMR, AMI provides two-way real-time communication between the meter and the utility company and is capable of collecting and distributing energy consumption data at more frequent time intervals. In addition, AMI systems have higher bandwidth, which helps in sending control messages to customers and thus contributes to demand-response and load management services.

AMR systems only provide data related to meter reading, peak demand and other such limited power quality information, while AMI can provide a list of information such as frequent daily and cumulative energy usage readings, peak demand measurements, logging of voltage and voltage-related events such as sags and swell, outage counts, and time-of-use energy usage and tamper notifications. Thus, AMI is a powerful and broadly useful tool for both consumers and utility companies.
2.2 **GlobalData Report Guidance**

This report discusses the global markets for components of AMI such as smart meters, meter data concentrators, smart meter installation services, communication infrastructure, meter data management systems and home area networks. The report also explains the AMI industry’s dynamics across the globe, identifying the key market drivers, standards, policies, and technology trends for the components mentioned above. The report also provides market outlooks for countries such as the US, Canada, Italy, the UK, Spain, France, Ireland, Australia, China, South Korea, and Japan. The structure of the report is as follows:

- The report begins with an executive summary that details the key findings of the report.
- The main body of the report begins from chapter two, which provides an introduction to the AMI industry and outlines the different market segments under AMI.
- Chapter three provides an analysis of the global market for smart meters that includes the annual revenues, annual units, Political, Economic, Social and Technological (PEST) analysis, key drivers, key challenges and an analysis on the cost of smart meters.
- Chapter four and five provide an analysis of the meter data concentrator and installation service market respectively, that includes an annual unit forecast for meter data concentrators and revenue forecast for the installation service market.
- Chapter six provides analysis of the key drivers, key challenges and global market scenario for the meter data management software.
- Chapter seven provides analysis of the global markets for communication infrastructure, which includes annual revenues, key drivers, key challenges and an analysis on the cost of communication infrastructure.
- Chapter eight provides an analysis of the key drivers, key challenges and global market scenario for the home area network sector.
- Chapter nine contains an analysis of the major national AMI markets, which are the US, Canada, Italy, the UK, Spain, France, Ireland, Australia, China, South Korea and Japan. The market information covered for each of these countries includes the regulatory scenario, smart meters market, meter data concentrator market, installation service market, meter data management market, communication infrastructure market, home area network market, a cost analysis, and a smart meter market share analysis.
- Chapter ten provides an analysis of the technological landscape for the AMI, meter data management systems and communication infrastructure markets.
3.8 AMI Smart Meters Market, Global, Market Share Analysis, 2011

In 2011, Landis+Gyr was successful in maintaining its leading position in the global smart meter market, with a market share of XX%. The highest market share is attributable to the key contracts won by Landis+Gyr for the supply of smart meters. Itron held the second position with XX% of the market share, giving close competition to Landis+Gyr. The high valued contracts won by Itron, justifies its position in the smart meter market. GE Energy and Elster Metering Holdings Ltd. captured nearly equal market shares, while the Sensus metering system holds fifth position with XX% of the market share, as shown in the figure below.

![AMI Smart Meter Market, Global, Market Share of Key Players (%), 2011](image)

Source: GlobalData, Primary Interviews with Marketing Managers, and utility Executives from Advanced Metering Infrastructure Industry, Company Websites

<table>
<thead>
<tr>
<th>Company</th>
<th>Market Share (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Landis+Gyr AG</td>
<td></td>
</tr>
<tr>
<td>Itron, Inc.</td>
<td></td>
</tr>
<tr>
<td>GE Energy</td>
<td></td>
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<tr>
<td>ELSTER Metering Holdings Ltd.</td>
<td></td>
</tr>
<tr>
<td>Sensus Metering Systems Inc.</td>
<td></td>
</tr>
<tr>
<td>Others</td>
<td></td>
</tr>
</tbody>
</table>

Source: GlobalData, Primary Interviews with Marketing Managers, and utility Executives from Advanced Metering Infrastructure Industry,
5 AMI Meter Installation Service Market

The AMI installation service market includes the installation of smart meters at the consumer’s home or premises. Corix, Metcor Inc. and TrueNet Communications are some of the key meter deployment service providers in North America. The large scale smart meter deployment plans of companies like these drive the market for installation service providers. Utilities which planned to deploy a large number of smart meters prefer to hire an installation service provider in order to complete their project on time. The deployment of smart meters requires trained personnel and it will be a time-consuming and capital-intensive process for utilities to train their personnel in meter deployment. As a result, utilities prefer to use the services of an installation service provider. Southern California Edison selected Corix to install its smart meters.

5.1 Global AMI Installation Service Market, Revenue Forecasts, 2009–2020

The growth of the smart meter installation service market is expected to be driven by the smart meter market. The initiatives taken by the developed countries such as the US, and developing countries such as China, South Korea are the major drivers for the global smart meter installation service market. The installation service market is expected to grow at a CAGR of XX% until 2020 reaching $XX billion in 2020, as shown in the figure below.

Figure 7: AMI Installation Service Market, Global, Annual Revenues ($bn), 2009–2020

Source: GlobalData, Primary Interviews with Marketing Managers, Economists and utility Executives from Advanced Metering Infrastructure Industry.
<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue ($bn)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
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<td>2011</td>
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<td>2018</td>
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<tr>
<td>2019</td>
<td></td>
</tr>
<tr>
<td>2020</td>
<td></td>
</tr>
</tbody>
</table>

Source: GlobalData, Primary Interviews with Marketing Managers, Economists and utility Executives from Advanced Metering Infrastructure Industry
9.2.5 Canada AMI Installation Service Market, Revenue Forecasts, 2009–2020

The AMI installation service market in Canada is expected to be driven by the deployment of smart meters by various utilities. Utilities have been using vendors specializing in AMI installation for these deployments. For BC Hydro, installation services were provided by Corix Utilities. The installation service market in Canada is expected to be $XXm in 2012, as nearly XXm smart meters are planned to be installed in 2012. The market is expected to grow from $XXm in 2013 to $XXm in 2017, as shown in the figure below.

![AMI Installation Service Market, Canada, Annual Revenues ($m), 2009–2020](source)

**Figure 20: AMI Installation Service Market, Canada, Annual Revenues ($m), 2009–2020**

<table>
<thead>
<tr>
<th>Year</th>
<th>Revenue ($m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td></td>
</tr>
<tr>
<td>2010</td>
<td></td>
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<tr>
<td>2019</td>
<td></td>
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<tr>
<td>2020</td>
<td></td>
</tr>
</tbody>
</table>

Source: GlobalData, Utilities websites, Primary Interviews with Marketing Managers, Economists and utility Executives from Advanced Metering Infrastructure Industry
11 Appendix

11.1 Market Definition

11.1.1 Smart Meter
AMI smart meters are defined as the electricity meters that facilitate two-way communication between consumers and electricity utilities.

11.1.2 Meter Data Concentrator
A meter data concentrator is a data collector unit which is being used to collect data from several meters and then transfer it to the utility center.

11.1.3 Meter Data Management System
The meter data management system frame the consolidated data collected through several meters into manageable and useful information and then facilitates this information across the utility enterprise.

11.1.4 Communication Infrastructure
The communication infrastructure includes the network built for the transfer of energy usage data from the smart meters to the utility companies. A smart meter transfers the data through a Local Area Network (LAN) or Neighborhood Area Network (NAN) to a data concentrator or bridge that is located near smart meters. The data concentrator then transfers this data to the utility company’s data centre through a WAN.

11.1.5 Home Area Network
A HAN is a wired or wireless communication network installed at the home that facilitates the transfer of information between various electronic devices such as in-home-display, computers, energy management devices and smart meters.

11.2 Abbreviations

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Form</th>
</tr>
</thead>
<tbody>
<tr>
<td>2G</td>
<td>Second Generation</td>
</tr>
<tr>
<td>3G</td>
<td>Third Generation</td>
</tr>
<tr>
<td>AMI</td>
<td>Advanced Metering Infrastructure</td>
</tr>
<tr>
<td>AEEG</td>
<td>The Authority for Electricity and Gas</td>
</tr>
<tr>
<td>AMCC</td>
<td>Advanced Metering Control Computer</td>
</tr>
<tr>
<td>AMM</td>
<td>Automated Meter Management</td>
</tr>
<tr>
<td>AMR</td>
<td>Automated Meter Reading</td>
</tr>
<tr>
<td>ANSI</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>ARRA</td>
<td>American Recovery and Re-investment Act</td>
</tr>
<tr>
<td>BPL</td>
<td>Broadband Over Power Lines</td>
</tr>
<tr>
<td>CAGR</td>
<td>Compounded Annual Growth Rate</td>
</tr>
<tr>
<td>CDMA</td>
<td>Code Division Multiple Access</td>
</tr>
<tr>
<td>CER</td>
<td>Commission for Energy Regulation</td>
</tr>
<tr>
<td>CER</td>
<td>Commission for Electricity Regulation</td>
</tr>
<tr>
<td>CFE</td>
<td>Comisión Federal de Electricidad</td>
</tr>
<tr>
<td>CIS</td>
<td>Customer Information System</td>
</tr>
<tr>
<td>CNE</td>
<td>Comisión Nacional de Energía</td>
</tr>
<tr>
<td>COAG</td>
<td>The council of Australian government</td>
</tr>
</tbody>
</table>
CRE  |  Commission de régulation de l'énergie
DECC  |  The Department of Climate Change
DOE  |  Department of Energy
DSO  |  Distribution System Operator
EDF  |  Électricité de France
EEI  |  Edison Electric Institute
EISA  |  Energy Independence and Security Act
EISA  |  Energy Independence and Security Act
EPA  |  Energy Policy Act
EPA  |  Energy Policy Act
ERDF  |  Electricité Réseau Distribution France
EREG  |  European Regulators’ Group for Electricity and Gas
ESC  |  Essential Service Commission
EU  |  European Union
EV  |  Electric Vehicle
FCC  |  Federal Communication Commission
GPRS  |  General packet radio service
GSM  |  Global System for Mobile Communications
HAN  |  Home Area Network
HV  |  High Voltage
IC  |  in-built chip
IC  |  Integrated Circuits
ICT  |  Information and Communication Technology
IEEE  |  Institute of Electrical and Electronics Engineers
IESO  |  Independent Electricity System Operator
IHD  |  In-Home Display
KEPCO  |  Korea Electric Power Corporation
KEPCO  |  Kansai Electric Power Co.
KSGI  |  Korea Smart Grid Institute
kW  |  Kilowatts
LAN  |  Local Area Network
LV  |  Low Voltage
MDC  |  Meter Data Concentrator
MDM/R  |  MDM/Repository
MDMS  |  Meter Data Management Systems
METI  |  The Ministry of Economy, Trade and Industry
MKE  |  Ministry of Knowledge Economy
NAN  |  Neighbourhood Area Network
NDLFF  |  Nuclear Damage Liability Facilitation Fund
NPV  |  Net Present Value
NSW  |  New South Wales
OEM  |  Original Equipment Manufacturer
OFGEM  |  Office of Gas and Electricity Markets
PG&E  |  Pacific Gas and Electric
PLC  |  Power Line Communication
11.3 Sources


11.4 Methodology

GlobalData’s dedicated research and analysis teams consist of qualified professionals with experience in marketing, market research and consultancy, with a background in the energy industry and advanced statistical expertise.

GlobalData adheres to the codes of practice of the Market Research Society (www.mrs.org.uk) and the Strategic and Competitive Intelligence Professionals (www.scip.org).

All GlobalData databases are continuously updated and revised. The following research methodology is followed for all databases and reports.
11.4.1 Coverage
The objective of updating GlobalData’s coverage is to ensure that it represents the most up to date vision of the industry. We track hundreds of smart grid news sources on a daily basis. Using this news flow and regular interaction with the industry experts, we identify the key trends being witnessed by the industry. These can be market opportunities, industry consolidation, technological breakthroughs and policy updates. Our articles and reports investigate these trends in detail and evaluate their market implication.

11.4.2 Secondary Research
The research process begins with exhaustive secondary research of internal and external sources to provide qualitative and quantitative information relating to each market. The secondary research sources that are typically referred to include, but are not limited to:

- Company websites, annual reports, financial reports, broker reports, investor presentations and US Securities and Exchanges Commission (SEC) filings.
- Industry trade journals and other literature.
- Internal and external proprietary databases.
- National government documents, statistical databases and market reports.
- News articles, press releases and web-casts specific to the companies operating in the market.

11.4.3 Primary Research
A primary research effort further substantiates findings and information captured through desk research. This aspect of the research program serves both as a means of obtaining updates regarding issues such as changes in policy frameworks, power sector development, and as a quality control mechanism. GlobalData conducts hundreds of primary interviews a year with industry participants and commentators in order to validate its data and analysis. A typical research interview fulfills the following functions:

- Provides first-hand information on the market size, market trends, growth trends, competitive landscape and future outlook.
- Helps in validating and strengthening the secondary research findings.
- Further develops the analysis team’s expertise and market understanding.
- Primary research involves telephone and email interviews as well as face-to-face interviews for each market, category, segment and sub-segment across geographies.
- The participants who typically take part in the process include, but are not limited to:
  - Industry participants: CEOs, VPs, marketing/product managers, market intelligence managers and national sales managers.
  - Outside experts: investment bankers, valuation experts, research analysts and key opinion leaders specializing in the alternative energy industry.

11.4.4 Modeling and Forecasting
In case of data gaps and especially while forecasting the market, we use in-house models to forecast the data. Historic data and the analysis of trends within it form the basis of all forecasting methodology. Various qualitative and quantitative factors are usually taken into account for estimating future growth. The forecast data is validated through various industry experts and a back-of-envelope test.
11.6 Disclaimer

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