Electricity Submetering for Smart Grid

Global Market Size, Key Issues, Regulations, Competitive Landscape and Forecast to 2020

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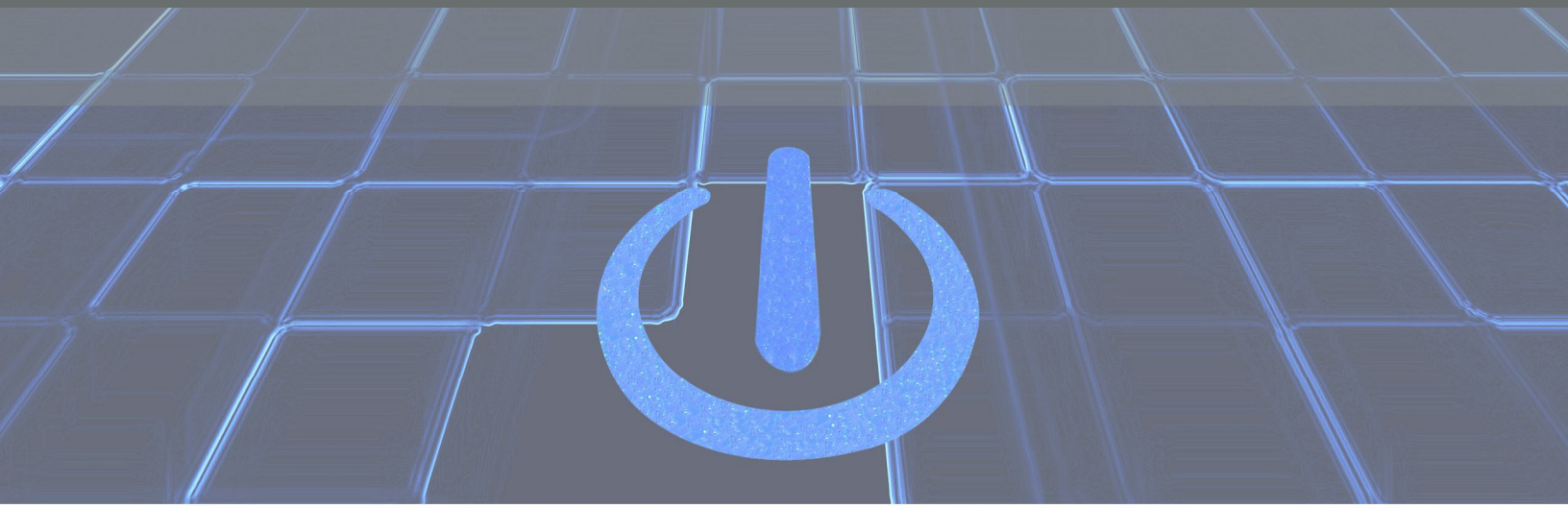
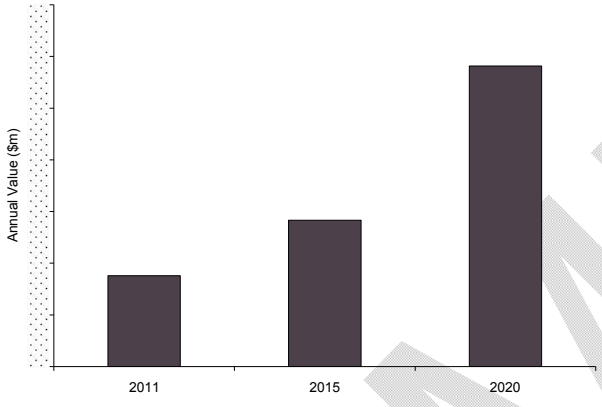


GlobalData

Global Electricity Submeter Market to Register Slow Growth Between 2012 and 2020

The global market for electricity submeters is expected to grow at a substantial rate over 2011-2020, although there are signs that market growth will slow in North America during this period. The global electricity submeter market is expected to grow at a Compound Annual Growth Rate (CAGR) of XX% between 2012 and 2020, driven primarily by the emergence of the Asia-Pacific and European markets. The markets in Europe and North America will be driven primarily by regional targets for energy-efficiency and reductions in energy consumption costs. The large untapped consumer base and the increasing need to be energy efficient is expected to drive the submeter market in the Asia-Pacific region.

Electricity Submeter Market, Global, Annual Value($m), 2011-2020



Source: GlobalData, Primary interviews with industry experts from electricity submeter market in the US, the UK and China

Focus on Energy Efficiency Improvement to Drive the Submeter Market

Increasing emphasis is being placed on improving the energy efficiency of buildings across all consumer segments, which is expected to drive the growth of the global electricity submeter market. Buildings account for a substantial share of energy consumption. For example, XX% of the energy consumed in Europe is accounted for by residential and commercial buildings, whereas in the US this percentage is as high as XX% (NIST, 2011). This has encouraged the introduction of building energy efficiency policies in key countries worldwide. A number of labeling programs and rating systems have also been introduced with the objective of developing energy efficient green buildings, such as Leadership in Energy and Environmental Design (LEED) in the US, the Building Research Establishment Energy Assessment Method (BREEAM) in the UK and the Comprehensive Assessment System for Built Environment Efficiency (CASBEE) in Japan.

Short Payback Period and Cost Savings Opportunities to Promote Submeter Deployments

The use of electricity submeters enables cost savings through the monitoring of energy consumption. The cost savings made on electricity bills have been as high $XX per year, achieved within a short period of time. A review of the projects involving submeter installation across the residential, commercial, industrial and institutional consumer segments demonstrated an approximate payback period of less than one year. The cost saving opportunities and the low payback period has promoted the adoption of submeters worldwide.

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2 Introduction

The supply and cost of electricity has become increasingly uncertain over recent years across the globe due to depleting reserves of oil, natural gas and coal, which are major resources for electricity generation. The depleting reserves and increased emphasis being placed on reducing Green House Gas (GHG) emissions has resulted in the need to improve energy efficiency at the consumer end, especially among tenants who lack clarity regarding individual energy consumption.

Globally, electricity cost accounts for the largest share of annual utility expenditure for government organizations, commercial complexes, industries, institutes and multi-family dwelling units such as apartment buildings. A substantial amount of power is used by these facilities to meet their day to day activities. Cost-cutting through electricity consumption monitoring has not yet been widely considered by these facilities, which generally receive a unified bill from the utility covering their entire power consumption. The electricity bills from the utilities do not provide any detail about the power consumed by any individual department, tenant or unit present within the facility. The data present in the utility bills does not help the organization to identify areas of waste or opportunities for power conservation and cost savings. This concern can be dealt with using submeters, which provide a solution to monitor and manage power consumption and thereby save cost. Submetering technology for the electricity industry involves the installation of a separate meter in addition to the utility or master meter, and the submeters are connected to the individual units or department for detailed power consumption data.

2.1 Submeter

Submeters are metering devices that monitor and measure the amount of power consumed by individual units within a facility. Submeters are installed after the installation of a master meter in facilities and buildings. They determine the power usage of a specific location, user or circuit. Submeters are available as electromechanical and electronic types. Electro-mechanical submeters are available in two versions: the socket version and current transformer version. Electronic submeters are preferred over electromechanical submeters due to low installation cost, small size and higher functionality.

The data on the power used by a single department or tenant within a facility allows consumers to devise an energy saving plan. The data provided by the submeters is very precise as a result of the fact that they can measure the power consumed by a single circuit branch. The precision of this data allows consumers to plan their consumption and thereby minimize their electricity bills.

Advanced technologies such as Automatic Meter Reading (AMR) are expected to ease operations such as meter reading in submetering technology. AMR will enable the submetering system to collect meter readings from remote locations at any possible time and in any weather. This feature is likely to make submetering cost effective and will also facilitate participation in demand response and time of use programs in order to reduce peak hour electricity load. Large facilities such as industrial plants, commercial buildings, airports, hospitals and other energy-intensive consumers will be the primary beneficiaries of this advanced technology.

Electricity submeters in the report are categorised into four types, namely, basic submeters, advance submeters, submeters for high-end applications and multi-point submeters based on their applications.

- Basic Submeters - These submeters help in recording the power consumption of an individual unit in multi-residential dwelling, industrial and commercial facilities
- Advance Submeters - These submeters facilitate advance applications such as automatic meter reading, pre-payment and time-of-use, in addition to recording the power consumption of the individual unit.
- Submeters for High-End Applications - These include power quality meters and net meters. Power quality meters are submeters that enable measuring of a range of parameters such as voltage fluctuations. The net meters enable in conducting net metering programs in which consumers trade self produced electricity with the utility.

- Multi-point Submeters - These are submeters that enable monitoring of multiple loads in a facility, which would otherwise require individual meters to monitor. For example, General Electric's multi-point submeters are capable of recording and monitoring eight three-phase tenant loads at a time in a facility.

2.2 GlobalData Report Guidance

This report discusses the global electricity submeter market and the markets in key countries such as the US, Canada, the UK, China and Australia. It explains the dynamics of the electricity submeter industry and identifies key market drivers, policies, price trends and cost benefit analysis for submeters. The electricity submeter market defined in the report is limited to hardware only and is categorized into four different segments such as basic submeters, advance submeters, submeters for high-end applications and multi-point submeters. The basic submeters considered for the market do not have smart grid applications, whereas, the other submeter categories considered have smart grid application. The market data for 2011 given in the report is an estimate of potential installations for electricity submeters.

The layout of the report is as follows:

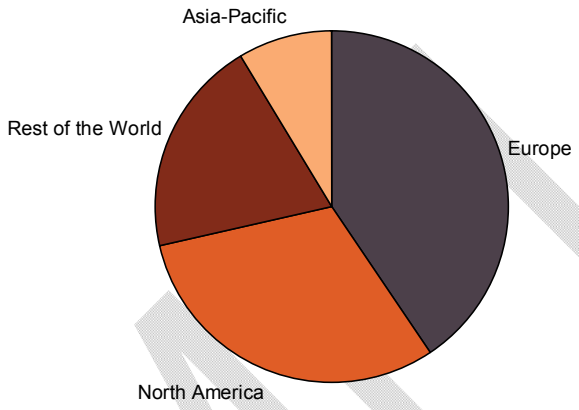
- The report begins with an executive summary, which details the key findings of the report.
- Chapter three provides an analysis of the global market for electricity submeters, including a market outlook for global electricity submeters until 2020, regional segmentation of the market, analysis of key drivers and restraints and key regulations.
- Chapter four provides analysis of the North American market for electricity submeters, comprising the US and Canada. The key elements covered for each country include annual value and annual volume forecast until 2020, price trend analysis until 2020 and the segmentation of the market between consumer segments.
- Chapter five provides analysis of the European market for electricity submeters in the UK. The key elements covered for each country include annual value and annual volume forecast until 2020, price trend analysis until 2020 and segmentation of the market between consumer segments.
- Chapter six provides analysis of the Asia-Pacific market for electricity submeters, comprising Australia and China. The key elements covered for each country include annual value and annual volume forecast until 2020, price trend analysis until 2020 and the segmentation of the market between consumer segments.
- Chapter seven provides analysis of the electricity submeter market in the Rest of the World (ROW) region.
- Chapter eight provides analysis of electricity submeter technology and identifies key technology trends in the global market.
- Chapter nine provides pricing analysis for the electricity submeter market across all consumer segments.
- Chapter ten provides analysis of the cost and benefits derived from implementation of electricity submeters in the consumer segments.
- Chapter eleven provides an analysis of the vendor landscape and profile of key players.

3.1 Electricity Submeter Market, Global, Percentage Contribution of Regions, 2011

The global electricity submeter market generated value of $XXm in 2011. Key factors such as high electricity cost, energy efficiency policies and the need to divide utility electricity bills among individual consumers according to their individual power consumption has driven the growth of the market. Europe accounted for a major share of XX% of the global electricity submeter market in 2011 and was followed by the North America market that accounted for XX% of the global value in the same year. .

The Asia-Pacific market made a substantial contribution to the global market in 2011, when it accounted for XX% to the global revenues. The contribution being made by the Asia-Pacific region to the global electricity submeter market is due to the considerable growth observed in the Chinese market. The remaining XX% of the global value was accounted for by ROW.

Figure 2: Electricity Submeter Market, Global, Contribution of Regions (%), 2011



Source: GlobalData, Primary interviews with industry experts from electricity submeter market in the US, the UK and China

Table 2: Electricity Submeter Market, Global, Contribution of Regions by Annual Value ($m), 2011

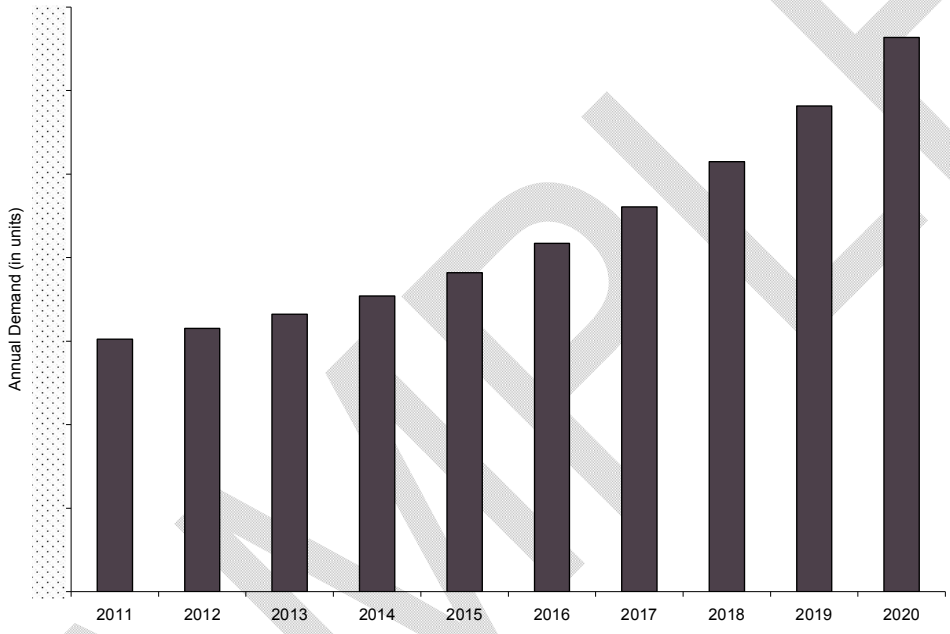
Region	Annual Value ($m)
Europe	
North America	
Rest of the World	
Asia-Pacific	

Source: GlobalData, Primary interviews with industry experts from electricity submeter market in the US, the UK and China

4.1.1 Electricity Submeter Market, The US, Annual Demand, 2011-2020

The electricity submeter market in the US is at a mature stage of development with annual demand amounting to approximately XX units in 2011. The annual demand for electricity submeters in the US is expected to increase considerably between 2011 and 2020 but will largely be dependent upon the energy efficiency policies and price of the submeter. The US government has introduced green certification programs such as the LEED, which is promoting the use to of submeters to improve the energy efficiency of the buildings. The electricity submeter market in the US is also influenced by the price of submeters. Submeters are retail products, which are purchased by the consumers directly, and consumers are generally sensitive to changes in price. Therefore, the number of submeters sold is expected to vary considerably in relation to price fluctuations. The annual demand for electricity submeters in the US is expected to grow at a CAGR of XX% from XX units in 2012 to XX units in 2020.

Figure 4: Electricity Submeter Market, The US, Annual Demand (Units), 2011-2020



Source: GlobalData, Primary interviews conducted with industry experts in the US electricity submeter market

Table 6: Electricity Submeter Market, The US, Annual Demand (Units), 2011-2020

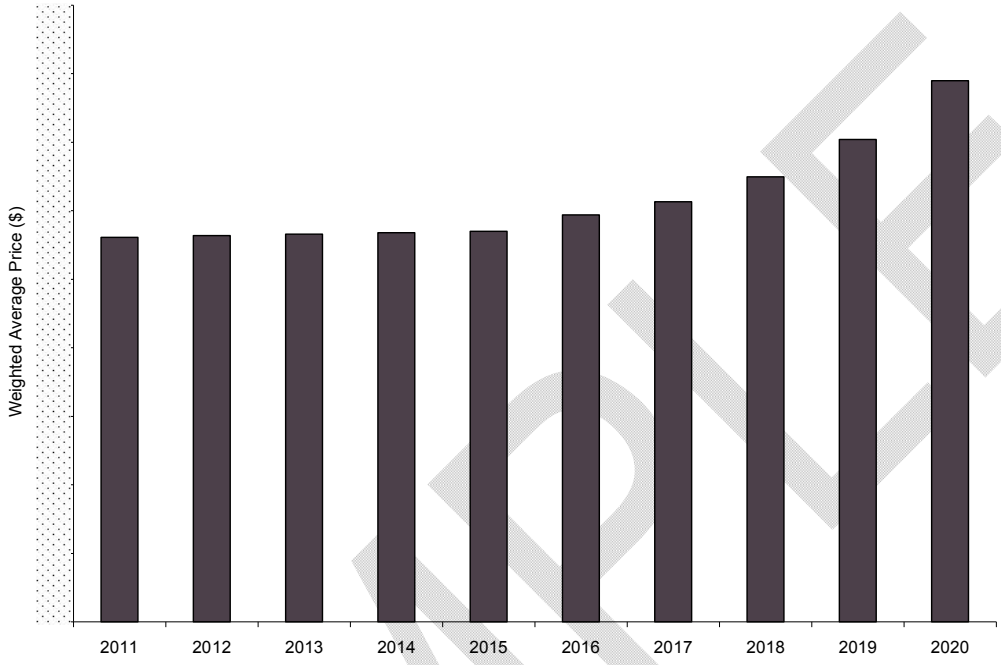
Year	Annual Demand (units)
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020	

Source: GlobalData, Primary interviews conducted with industry experts in the US electricity submeter market

6.1.2 Electricity Submeter Market, Australia, Weighted Average Price Trend, 2011-2020

The weighted average price of electricity submeters in Australia was approximately $XXper unit in 2011. The price of electricity submeters in Australia is expected to grow at an estimated CAGR of XX% from $XX in 2012 to $XX by 2020. The gradual increase in the price can be attributed to improvements in submeter technology during the period 2012-2020.

Figure 17: Electricity Submeter Market, Australia, Average Price ($), 2011-2020



Source: GlobalData, Primary interviews with industry experts in Australia electricity submeter market

Table 19: Electricity Submeter Market, Australia, Average Price ($), 2011-2020

Year	Weighted Average Price ($)
2011	
2012	
2013	
2014	
2015	
2016	
2017	
2018	
2019	
2020	

Source: GlobalData, Primary interviews with industry experts in Australia electricity submeter market

12 Appendix

12.1 Market Definition

Electricity Submeters

Electricity submeters are energy monitoring and measurement devices that are installed by the buildings owners in individual units of residential, commercial and industrial facilities.

Master Metering

Master metering is a method where the utility installs only one meter to record and measure power consumption of the entire building or facility.

Direct Metering

In direct metering, the utility installs individual meters for each tenant or department within a building to read and bill the consumer for their power consumption based on actual usage.

Energy Efficiency

Energy Efficiency encompasses all changes that result in a reduction in the energy used for a given energy service.

Building Energy Management Systems

A building energy management system is a monitoring and control system that helps in avoiding energy wastage by controlling different building functions through a network of sensors, controllers and actuators.

Basic Submeters

These submeters help in recording the power consumption of an individual unit in multi-residential dwelling, industrial and commercial facilities

Advance Submeters

These submeters facilitate advance applications such as automatic meter reading, pre-payment and time-of-use, in addition to recording the power consumption of the individual unit.

Submeters for High-End Applications

These include power quality meters and net meters. Power quality meters are submeters that enable measuring of a range of parameters such as voltage fluctuations. The net meters enable in conducting net metering programs in which consumers trade self produced electricity with the utility.

Multi-point Submeters

These are submeters that enable monitoring of multiple loads in a facility, which would otherwise require individual meters to monitor. For example, General Electric's multi-point submeters are capable of recording and monitoring eight three-phase tenant loads at a time in a facility.

12.2 Abbreviations

Table 32: Abbreviations	
Abbreviation	**Full form**
AMI	Advance Metering Infrastructure
AMR	Automatic Meter Reading
BEMS	Building Energy Management Systems
BREEAM	Building Research Establishment Energy Assessment Method
BTP	Building Technologies Program
CAGR	Compound Annual Growth Rate
CASBEE	Comprehensive Assessment System for Built Environment Efficiency
CIBSE	Chartered Institution of Building Services Engineers
COAG	Council of Australian Governments
ConEd	Consolidated Edison
CT	Current Transformer
DoD	Department of Defense
DoE	Department of Energy
ECC	Environmental & Combustion Control
ECPA	Energy Consumer Protection Act
ED	Electronic Devices
EES	Energy and Electric Systems
EISA	Energy Independence and Security Act
EPAct	Energy Policy Act
EPBD	Energy Performance of Buildings Directive
GBP	Green Building Program
GHG	Green House Gas
GIL65	General Information Leaflet 65
HA	Home Appliances
HVAC	Heating, Ventilation, and Air-Conditioning
IAS	Industrial Automation Systems
ICS	Information and Communication Systems
IP	Internet Protocol
ITP	Industrial Technologies Program
kW	kilowatt
kWh	kilowatt hour
LEED	Leadership in Energy and Environmental Design
M&V	Measurement & Verification
MOHURD	Ministry of Housing and Urban-Rural Development
NSEE	National Strategy on Energy Efficiency
NYSERDA	New York State Energy Research and Development Authority
OEB	Ontario Energy Board
PLC	Power Line Carriers
RBC	Read Bill and Collect
RF	Radio Frequency
ROI	Return On Investment
ROW	Rest of the World

RUB	Ratio Utility Billing
SC	Service Charge
SCM	Solar Current Monitor
SSHA	Support and Housing Administration Division
THESL	Toronto Hydro Electric System Limited
TM	Technical Memorandum
UAE	Unites Arab Emirates
USGBC	US Green Building Council
VEE	Validating, Estimating and Editing
Source: GlobalData	

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12.4 Methodology

GlobalData's dedicated research and analysis teams consist of experienced professionals with a pedigree in marketing and market research, consulting backgrounds in the energy industry, and advanced levels of 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's databases are continuously updated and revised. The following methodology has been followed for the collection and analysis of data presented in this report.

12.4.1 Coverage

This report provides detailed information relating to electricity submeter market in the US, Canada, the UK, Australia and China, The report provides:

- An overview of electricity submeters and policies for key countries
- The annual demand, average price and market value for electricity submeters in each of the country for the period 2011-2020
- Drivers and restraints for the global electricity submeter market
- Electricity submeter technology development
- Description of 10 key players driving the electricity submeter market

12.4.2 Secondary Research

The research process begins with exhaustive secondary research within GlobalData's own databases and external sources such as government websites, green building councils, literature review, policy review, nodal offices, building associations, central census records, law associates, programme implementation units etc.

The national, provincial, city-level regulations pertaining to energy efficiency, tenant-metering, building code compliance, incentives for green building certifications, energy rating disclosure are studied to understand the buying decisions and the mandates the electricity procurers, consumers need to abide.

Market demand, values, pricing estimates and market growth rates are arrived at by taking the following into consideration:

- Statistics and historic trends provided by government bodies, industry associations and equipment vendors
- Government regulations and policies
- Number of projects or programmes implemented in response to the policies and green building programmes

- Number of bulk metering deals concluded during the past few years
- Annual sales figures, company sales figures from sales departments, performance from annual reports or press releases
- Other insights built through secondary research and analysis of company websites, annual reports, investor presentations, industry and trade journals, association data

12.4.3 Primary Research

A number of primary interviews are conducted with personnel across the value chain to verify and fine-tune the market numbers obtained from secondary research and get first hand information on industry trends

Participants are then drawn from a diverse set of backgrounds including equipment manufacturers, industry associations, government bodies, utilities. Participants include, but are not limited to, business development and sales managers, C- level executives, industry consultants, certified professionals operating in the industry, purchasing managers and public forum for discussion.

12.4.4 Definitions, Market Estimates and Assumptions

- The electricity submeter market defined in the report provides data for submeter hardware only and the defined market includes basic submeters, advance submeters, submeters for high-end applications and multi-point submeters.
- The average market demand for electricity submeters has been calculated based on secondary and primary research. Various projects, metering deals policies and legislation have been used to arrive at the total market demand, revenues and share of the various regions
- The demand potential for electricity submeters has been arrived at taking into account the number of projects undertaken for metering in a country and number of meters that would have been installed in those projects
- The annual demand potential and weighted average price for electricity submeters has been calculated by adding the units and average price of the basic submeters, advance submeters, submeters for high-end applications and multi-point submeters during the current and forecast period. The annual market value for the forecast period is calculated by multiplying the estimated demand and expected average price of submeters for every year.
- Various qualitative and quantitative insights have been considered for estimating the market size. The forecast data and model has been validated through various industry experts

12.6 Disclaimer