

## The L.E.K. Consulting Global Smart Metering Report 2009/2010

The ever-growing global demand for energy, combined with increasing scarcity of resources and the threat of irreversible climate change, have prompted a drive toward clean, renewable energy sources and higher energy efficiency. The smart grid is a key enabling technology for energy efficiency as consumers will be able to reduce and optimize their consumption based on higher transparency and demand-response tariffs. In addition, the smart grid will be vital in dealing with the increasing fluctuation of energy supply resulting from a growing share of decentralized and renewable power generation. However, only a new and fully digitally enabled grid architecture will be able to deliver on these needs.

Investments required for the smart grid are estimated to reach several trillion US dollars, with a large part of the funds needed for maintenance, upgrades and replacement of the existing transmission and distribution infrastructure. Metering hardware in homes and businesses also needs to be replaced or upgraded to achieve the main purposes of the smart grid and smart energy provision.

A number of countries have been proactive in driving change towards smarter meters for electricity, gas and water by passing mandatory regulation or by encouraging voluntary adoption by utilities through favorable rate recovery regimes and other incentives. Most notably the United States government has included smart metering in its stimulus funding programs with \$3.3bn in subsidies being allocated to applicant utilities in October 2009. Similarly, the European Union (EU) is encouraging adoption of smart metering technology in its

member states in the Third Energy Package and subsequent regulation. Smart meters are also under review in Asia, and particularly in China, where the government has significantly accelerated the original time frame for smart meter implementation as part of its public infrastructure programs.

### Study Scope and Approach

In 2009, L.E.K. prepared a comprehensive smart metering study covering 19 countries across the North American Free Trade Agreement (NAFTA), Europe and Australasia to address key questions on likely volume and value demand during a 10-year forecast, such as:

- What is fundamentally driving (or constraining) smart meter adoption by country, by utility (electricity, gas and water) and segment (residential, commercial and industrial)?
- How “smart” will the meters really be and what functionalities will likely be included?
- Who are the main players in the global smart metering market and what are their relative shares?
- During the next 10 years how is market volume and value likely to evolve by country, utility and segment?

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L.E.K.'s study results are based on a combination of primary and secondary research. Specifically, more than 500 interviews were conducted with utilities, meter suppliers, regulators and other industry experts. In addition, L.E.K. reviewed key market and industry reports and publications by meter suppliers and relevant public authorities, as well as trade press. Research was conducted between April and June 2009 and an update of the NAFTA region (Canada, Mexico and the US) was prepared in January and February 2010 to take into account the fast-changing market environment in this region, especially in the US given the acceleration of planned roll-outs and in light of stimulus funding.

Market forecasts are based on primary and secondary research. While most countries have been modeled via a top-down approach based on market feedback and regulatory environment, the US and Canada have partly been forecast via a bottom-up aggregation of current and announced roll-outs.

L.E.K. was commissioned by a client to conduct the study but acted as an independent advisor with the brief of providing an objective view of the industry and its likely development. This summary represents a top-level summary of findings. More detailed findings (c. 340 pages covering 19 markets in detail and including data appendices) are available upon request. Please direct any enquiries to the contact details listed at the end of the document. The 19 markets worldwide were covered in different levels of depth depending on hypotheses on their attractiveness:

#### NAFTA

Canada  
Mexico  
US

#### South America

Argentina  
Brazil

#### Europe

France  
Germany  
Italy  
Netherlands  
Russia  
Spain  
United Kingdom (UK)

#### Middle East & Africa (MEA)

Saudi Arabia  
South Africa  
United Arab Emirates (UAE)

#### Asia Pacific

Australia  
China  
India  
New Zealand

### Figure 1

#### Key Issues Reviewed

##### Installed Base of Meters

- Connection rate to respective utility and metering penetration rate by utility segment and application
- Total installed base of meters by utility segment and application
- Current share of standard vs. AMR/AMI meters in the installed base
- Market drivers for smart meters

##### Regulatory Landscape

- Regulatory landscape by utility segment
- Regulatory developments
- Key decision makers/influencers for smart meter introduction

##### Product Definition

- Types of standard meters used and replacement cycle
- Likely product features

##### Price Assumptions

- Average price of standard meters
- Price of emerging AMR/AMI products

##### Market Volume

- Development of installed base of meters and drivers thereof
- Annual shipments of standard meters and AMR/AMI meters
- Smart meter penetration analysis by utility segment and application

##### Market Value

- Overall market value by utility segment, application and product category
- Annual market values by utility segment, application and product category

##### Competitive Landscape

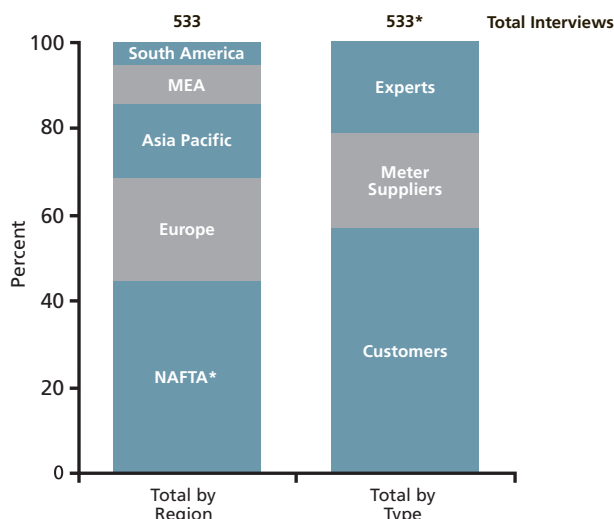
- Overview of main players
- Global market shares in terms of value

Study results are based on a combination of primary and secondary research:

- More than 500 interviews were conducted with utilities, meter suppliers, regulators and other industry experts across all 19 countries under review
- In addition, L.E.K. reviewed relevant market and industry reports, databases, and publications by meter suppliers and public authorities, as well as trade press (in total more than 220 documents)

**Figure 2**

In terms of external market research, L.E.K. conducted more than 500 interviews with market participants in the Americas, Europe, Asia Pacific and other regions



Note: \* 102 interviews conducted in the NAFTA region for the January–February 2010 update

Given large product overlap between residential and small commercial customers, the study includes small commercial customers in the residential segment rather than in the large commercial/industrial segment.

## Executive Summary – Market Development

The smart metering market is driven by a number of favorable underlying market trends (such as increasing utility connection rates or rising metering penetration rates) as well as specific advantages associated with smart metering such as consumer benefits (higher transparency and control of consumption), reduced energy costs, and improved energy efficiency and supply.

Among the most important drivers are regulation and political interest in smart metering, which in many parts of the world have accelerated smart meter industry development. Regulators develop the framework, and in many countries, drive the decision-making process on smart meter definition and adoption. Based on the respective frameworks utilities have to develop appropriate solutions:

- In Canada and the US, large-scale deployment of smart meters is encouraged by regulation and supported by governmental funding
- Largely driven by regulation, most Western European countries are planning to start large-scale smart meter roll-outs for electricity and gas

**Figure 3**

### Product Definitions Used in the Study

#### Definition of product by meter type

| Meter Type | Description  | Components Required                                    |
|------------|--|--|
| Standard   | Mostly an electronic device for electricity and a mechanical volumetric device for gas or water  | Meter  |
| AMR*       | Meter with 1-way communication capabilities<br>– regular, scheduled readings, transmitted one-way for instance by file transfer<br>– main examples: C&I meters, drive by or walk by solutions  | Meter<br>Communication components                      |
| AMI        | Meter with 2-way communication capabilities between reading engines/MDM and back-end system<br>– enables for instance on demand reading and remote connect-disconnect<br>– main examples: single or multi-utility residential metering | Meter<br>Communication components<br>Network equipment |

#### Definition of product by sub-component

| Component            | Sub-component Included  |
|----------------------|---|
| Meter                | Meter<br>Prepayment<br>Remote connect/disconnect (only for AMI)<br>Volume corrector** (US gas only) |
| Communication Device | Communication device<br>HAN<br>Data logger**<br>Volume corrector**<br>Function extension unit**     |
| Network Equipment    | Concentrators<br>Repeaters<br>AMI head-end<br>MDM   |

Note: \* Network equipment not detailed separately (typical walk-by at negligible cost or already included in communication device),

\*\* Only for large commercial/industrial segment

Source: L.E.K. interviews and analysis

**Figure 4****Segment Definitions Used in the Study**

Definition of market segments

| Application Segment         | Description   | Types of Meters Used   |
|-----------------------------|---|--|
| Residential                 | The residential segment includes all electricity, gas and water meters used in private households and multi-dwelling buildings      | Residential meters<br>Only a small variety of meter types as consumption does not differ significantly between customers |
| Small Commercial            | Small commercial customers include small businesses, e.g., shops, offices and other commercial entities located in office buildings | Meters used are similar to residential meters  |
| Large Commercial Industrial | Large commercial and industrial customers with high energy and water demands that require highly accurate and frequent readings     | Large variety of industrial meters exist in accordance with capacity (electricity, gas)/throughput (water)               |

Source: L.E.K. research and analysis

- Countries in Asia-Pacific and MEA are predominantly driven by monopoly utility policy that drives trial projects

Many of the countries under review are expecting significant shipments of AMR and AMI meters through 2019. Across those countries covered, electricity is expected to be the first wave of major smart meter deployments and also represents the largest opportunity in market size.

Over the period 2010–19 a total of 2.3bn meters are expected to be sold in the 19 countries under review, thereof 1.4bn standard meters and 0.4–0.5bn AMR and AMI meters each:

- In addition, there appears to be significant additional upside value potential from increasing functional requirements where specifications have not yet been finalized (i.e., AMI rather than originally planned AMR smart meters), particularly in China, but also in Russia, Saudi Arabia and UAE
- While smart meters account for 33% of meters sold in the first five years of the forecast period (2010–14), their share is expected to increase to 46% in the second half of the forecast period (2015–19)
- Asia accounts for 82% of standard meter units during the forecast period, Europe for 8%, South America for 4%, NAFTA for 5%, and MEA for 1%

In terms of smart meters, China represents the largest opportunity (333m meters) to 2019 followed by NAFTA (266m). Europe offers a similar market size opportunity (271m) which is, however, expected to materialize during a longer period. The Australia and New Zealand (ANZ) region represents immediate opportunities in the smart meter segment albeit on a small scale (14m). South America (22m) and MEA (6m) also constitute smaller smart meter opportunities.

There is a market for both AMR and AMI in most countries:

- In Europe AMI technology is dominating the residential segment (except for gas and water in France) while AMR is predominantly used for large commercial and industrial applications (AMR share of installed base in 2008: 3%, AMI share of installed base: 8%)
- The US continues to see AMR deployments also in residential, although the AMI share has increased
- The global 2008 AMI installed meter base is estimated at 52m endpoints (of which c.48m in electricity and c.2m in gas and water each) and forecast to grow by 32.9% p.a. until 2014
- The largest AMR potential appears to exist in the gas segment where still more than 85% of the global installed base will be standard meters by the end of 2008 (AMR installed base end of 2008: 32m meters)

The meter market value in the 19 countries included in the study accounts for US\$6.2bn in 2009 and is expected to peak at c.US\$10bn in 2013 driven by a product shift towards higher-value smart meters:

- While standard meters are still expected to retain the main share of the market volume during the forecast period, smart meters are soon expected to be the main market value driver, and their value share of the total market is expected to increase from 51% in 2009 to 79% in 2019
- AMI accounts for 48% of the cumulated market value in the forecast period, AMR for 26% and standard meters for 26% respectively

After the completion of the roll-out in some countries, annual market values are expected to decrease to c.US\$9bn in 2019; however, technology evolution to smart grid (not considered in the scope of this study) is likely to provide further meter revenue opportunities.

## Executive Summary – Competitive Environment

- Itron, Elster and Landis+Gyr are the top three global meter players in terms of value. In 2008\*, they had a combined market share of c.51%, with Itron holding c.22%, Elster c.17% and Landis+Gyr c.12% in terms of value
- The electricity segment is fairly fragmented with Landis+Gyr and Itron leading the market followed by Elster. In 2008, the top three players had a combined market share of 57% in value terms
- In gas, Elster is the global market leader with Itron and Landis+Gyr being the market followers. In 2008, they had a combined market share of c.60%, with Elsters holding c.33%, Itron c.22% and Landis+Gyr c.5% in terms of value
- In the water segment, there are several strong suppliers including Itron, Elster, Sensus and Neptune. The top three players held a combined market share of 48% in terms of value in 2008

Note: \*The latest year for which full year accounts of major players were available at the time of writing

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