



## CASE STUDY:

# KEPCO Rolled-out Nuri's AMI Solution to its 140,000 C&I Customers throughout South Korea

*"AiMiR AMI has permitted us to create pricing policies based on time interval usage. That was not possible before with mechanical meter reading. Also, we can now constantly monitor electricity usage, and AiMiR immediately notifies us of abnormal activity so that we can immediately take corrective action. This permits us to maintain high quality service to our customers and avoid costly electricity losses."*



Kim Kyoung Soo, Sales Operation Manager | Korea Electric Power Corporation (KEPCO) | Seoul, Korea

## CHALLENGE

Limited functionality of communications systems, a labor-intensive and inaccurate process of physical meter reading, increasing customer complaints, escalating non-technical losses, and non-optimum business process efficiencies and distribution asset management prompted KEPCO to investigate a new high performance automatic metering system to overcome these problems.

## SOLUTION

The solution was to implement Nuri Telecom's end-to-end AiMiR C&I AMI communications system. Nuri worked in tandem with KEPCO to scope out and carefully define the issues KEPCO faced. Nuri designed a flexible solution that allowed KEPCO to remotely and periodically collect metering, power quality, and efficiency data from its 140,000 C&I customers throughout the country.

## Company

Headquartered in Seoul, KEPCO (Korean Electric Power Corporation) is the leading energy company in South Korea. KEPCO has been associated with the growth of Korea's energy infrastructure for over 119 years. It is highly respected for its role in the evolution of South Korea into one of the most spectacular economic success stories. It provides electricity primarily to industrial, commercial, and residential customers, as well as to educational, agricultural, and street lighting customers.

KEPCO serves over 140,000 C&I customers with peak demands of more than 100kW. Looking at it from a dollars and cents perspective, that number represents more than 50 percent of KEPCO's total revenue, although it's less than one percent of its total customer base.

## Situation

KEPCO's goal is to provide abundant electric power and to develop high quality and reliable power resources to South Korea's mushrooming businesses and households. As a result of that growth, there is dramatically escalating demand for energy.

KEPCO's management realized early on that its energy operations based on antiquated analog meters and manual meter reading was posing severe problems in a number of ways. At the top of the list were non-optimum business process efficiencies and distribution asset management, resulting in less than adequate customer service and lost revenues. Customer billing information was not as accurate or comprehensive as KEPCO wanted it to be. The maximum number of meters a meter reader could read was seven a day because it was physically difficult to visit many customer sites. Meanwhile, KEPCO's operational costs were constantly jumping to higher levels. In addition, there were the large organizations of meter readers — personnel that KEPCO felt could be re-trained to make greater customer contributions. In short, KEPCO sought to enhance its customer service and streamline its energy operations by building a new high performance automatic metering system.

KEPCO sought the guidance and expertise of world-renowned Nuri Telecom to find ways to significantly automate energy operations for its C&I customer base.

## THE NURI DIFFERENCE

**Nuri in collaboration with its technology partners and system integrators offers utilities end-to-end, turnkey AMI delivery models including performance guarantees:**

- **AiMiR Communication System Components**

- **AiMiR Head End Communication Server**

- **AiMiR Software Suite**

- **Full range of Professional Services:**

- AMI solution architect
- Network deployment
- Network operations
- Integration of AMI solutions with existing IT, operations and asset management processes

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## Architecting the Solution

Working in close collaboration with KEPCO and keeping their requirements in mind, Nuri architected an end-to-end, two-way AMR communications system enabling KEPCO to remotely read individual meters at any time on demand. The solution was designed for KEPCO to remotely collect metering, power quality and efficiency data periodically from its 140,000 C&I customers throughout the country using Nuri's AiMiR C&I AMI (Advanced Metering Infrastructure) technology. The system was designed with the utmost flexibility to support locally manufactured Nuri technology enabled smart electricity meters from eight different manufacturers. KEPCO decided to use a CDMA (Code Division Multiple Access) wireless network to connect C&I meters to the AiMiR Head End servers located at its data centers.

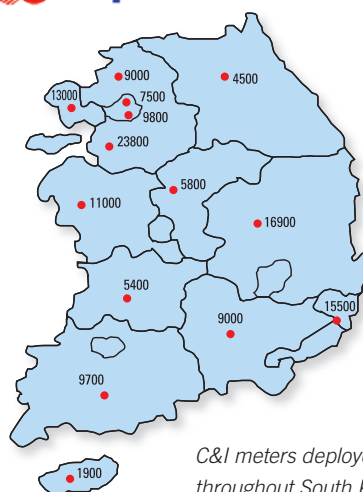
Furthermore, KEPCO's AiMiR system was designed with scalability considerations for future integration with KEPCO's NDIS (New Distribution Information System) and NCIS (New Customer Information System) as well as other business information systems for effective and timely business management.

Nuri's AiMiR C&I AMI system solution consists of:

- Nuri Technology enabled smart meters
- Automatic remote meter reading using digital cellular modems
- AiMiR Head End servers
- Metering, Meter Data Management and Network Management Software
- Meter data integration services for billing system
- EBPP (Electronic Bill Printing & Payment) services for KEPCO customers

## Solution Deployment

Nuri Telecom successfully conducted a pilot project for the Youngdeung-Po district, as an initial step. Subsequently, KEPCO rolled out Nuri Telecom's AMI solutions to its customers in Seoul and the rest of the country through its corporate headquarters and 14 regional branch offices.



*C&I meters deployed throughout South Korea*

## Results To Date

Thanks to the AiMiR AMI system, KEPCO is realizing a number of energy efficiency and economical benefits such as:

- 1) Operational efficiencies, reduced costs and improved cash flow
- 2) New and improved services to its customers
- 3) Cost effective Demand Response programs
- 4) Foundation prepared for the future enhancements that will support a two-way "smart grid"

The following targets were achieved:

- Improved metering and billing services – Nuri AMI provides two-way communication and interval data from every meter in the network
- Realized meter reading savings - significant reduction in labor and associated vehicle, fuel and maintenance costs
- Reduced customer contact center costs – customer service representatives use "most recent" meter read for to resolve high bill complaints, complaints about missed or estimated reads, meter access problems, etc
- Load monitoring and forecasting – AMI provides daily inputs to the load forecast. Interval data collected is used for load forecasting
- Implemented Demand Response programs – through 27 different tariff schemes
- Empowered customers to manage their energy use – KEPCO provides meter interval data to its customers to make informed decisions about ways to better manage their energy use
- Transmission/distribution/generation planning – accurate usage data is enabling KEPCO to effectively plan and manage systems
- Maintained customer privacy – customers objections to having meter readers on their properties is eliminated
- Tamper and theft detection – mechanism is in place to detect theft or diversion using tamper alarms and data analyses on meter interval data
- High-availability (HA) Network – achieved interruption free service 24 hours/365 days, reduces operational expenses and revenue loss due to service interruptions.

Nuri's AMI technology has contributed to KEPCO's remarkable achievements in the energy delivery sector in many ways. In 2007, KEPCO's outage time per household was reduced down to 17.2 minutes which is much less than advanced countries such as the United States and France. Transmission and distribution losses were down to 3.99%, voltage regulation compliance ratio was at 99.9%, and frequency regulation compliance ratio was at 99.7% representing world-top class performances.