

# Remarks for Special Issue on NEC's Smart Energy Solutions Led by ICT

Our focus at NEC is on Solutions for Society, which simply means using ICT (Information Communication Technology) to support the development of more advanced and more responsive social infrastructure. By exploiting our expertise in ICT, we hope to contribute to society by creating value in the areas of safety, security, efficiency, and equality. One of the most important problems facing society today is the impact on the environment of rapidly escalating demand for energy. For example, it is predicted that demand for electric power will nearly double, increasing by 1.8 times today's level. At the same time, urban populations will rapidly expand worldwide (6.3 billion in 2050, which is 1.8 times the current figure). Global warming is also a problem that requires urgent attention. International efforts are underway to suppress greenhouse gases as evident in the COP 21 (2015 United Nations Climate Change Conference) held in France from November 30 to December 12, 2015.

To meet increasing energy demands, we think that it will be necessary to continuously employ conventional power generation technologies that have already shown results, including ones that use petroleum, coal, natural gas, and nuclear fuel, as well as to increase the efficiency of heat source usage. In the coming years, renewable energy such as solar and wind are also expected to increase in cost-efficiency and reliability. To achieve an optimal balance between energy requirements and environmental sustainability, individual nations and regions around the world will be faced with the task of developing an energy mix best suited to

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local conditions.

In Japan, there have been major reforms to the electricity and gas systems. Specifically, full-scale deregulation of electrical power retail sales will begin in April 2016. Transmission and distribution of electricity will be legally unbundled with a target deadline of 2020. Up until now, conventional power systems have been built around designated providers who have generated large quantities of power and supplied it to users while maintaining the stability of their systems. In the future, however, not only will many new providers enter the energy market, but an increasing number of users will also own the functions necessary to generate and store electricity, which will result in a transition from a centralized energy system to a dispersed one.

Due to the changes in the nature of power distribution systems taking place both inside and outside Japan, it will be essential to have the ability to finely adjust and control the supply of energy resources to meet regional demands, while ensuring stable operation of the systems and supply networks to which the regions are connected. We also anticipate that needs matching that connects users with the various services offered by all the new providers will also be required.

At NEC, we are focusing on Smart Energy Solutions that integrate our core strengths in both ICT and power systems technology - which are world-class. For instance, using cloud-based ICT technologies that collect, visualize, analyze/predict, and optimally control various real-world data related to energy,

we can connect and coordinate the supply side and demand side. What's more, by facilitating the smooth interaction of various energy resources such as batteries, heat pumps, EVs (electric vehicles), we will contribute to optimizing the efficiency of energy supply and demand. We will also make it possible to accommodate various energy resources within a community while interfacing with systems and supply networks, ensuring efficient energy usage throughout the region. Furthermore, we believe that we can address problems such as facility/equipment obsolescence or a shortage of management personnel using our ICT-based facility diagnostic technologies, investment reduction measures, and business solutions. We are confident that we will be able to offer services and values that match the needs of society - that is to say, autonomy, dispersion, and harmony/stability, by analyzing data gathered from energy systems and passing that data to energy management systems for practical and active utilization.

Using our Smart Energy Solutions - which integrate leading-edge ICT and energy technology, NEC will continue to help build a society where people can enjoy a safe and secure life that impacts minimally on the environment. This special issue entitled, "Smart Energy Solutions Led by ICT", highlights the values and capabilities we bring to today's energy environment through in-depth case studies and other examples.

We hope that you will take a look at this issue and look forward to your continued patronage and support of NEC.

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## Vol.10 No.1 Special Issue on NEC's Smart Energy Solutions Led by ICT - Towards the Integration of ICT and Energy -

Remarks for Special Issue on NEC's Smart Energy Solutions Led by ICT  
NEC's Smart Energy Vision

### Solution for general customers

NEC's Cloud-Based HEMS Solution Advances with Data Utilization  
HEMS Data Utilization Solutions Using Autonomous Adaptive Control  
Cloud-Based EV/PHV Charging Infrastructure Service  
A Compact Energy Storage System for the "Storage and Smart Use of Electricity"  
Lightweight, Long-Life Lithium-ion Secondary Battery Pack for Communications Equipment

### Solution for enterprises

The Introduction and Deployment of NEC's Smart Energy Management System - "Smartizing" Energy Management at Obayashi Corporation Technical Research Institute and NEC Tamagawa Plant, Building 9 -  
Cooling Technology to Reduce Air-Conditioning Power Consumption in Data Centers  
Validating the Performance of NEC's Tamagawa Building Smart Energy System  
EMS (Energy Management Systems) Technologies Optimizing Energy Consumption for Mobile phone Base Stations

### Solution for energy enterprises

Development of Energy Supply & Demand Management System at the Core of Our Electric Power Supplier Solution  
Power Plant Fault Sign Monitoring Solution Based On System Invariant Analysis Technology (SIAT)  
Situational Intelligence for Resource Optimization  
Power Supply-and-Demand Balancing Solution Using Distributed Storage Batteries  
Using Energy Storage to Prepare the Electricity Grid for a Clean, Reliable, Renewable Future  
Grid Stabilization Solution That Helps Ensure a Stable Supply of Electric Power: Grid Energy Storage System for Italy's ENEL  
NEC's Contribution to Advanced Metering Infrastructures (AMIs)

### Technology development and standardization

Methodology for UN/CEFACT Standards  
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