CHALLENGES AND OPPORTUNITIES IN THE ERA OF DIGITALIZATION

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I. Electricity Market situation in Japan

1. Aging facilities
   • Over 60% of Transmission towers ⇒ > 40 years old
   • Over 50% of Transformers ⇒ 20-25 years old

2. Aging population
   • Lack of young workforce

Cost

143 billion €
/ year ※1

Greater efficiency and cost savings are necessary

How can we turn these problems into opportunities

3. Digitalization
   • Smart meters ⇒ 78 million units (2024, for all customers)
   • Drones ⇒ 6 → 3 maintenance staff per site (Transmission Tower)
   ⇒ Kumamoto earthquake (2016)

4. Market Reform
   • Liberalization ⇒ retail sales and generation (from April 2016)
   • New entrants ⇒ 380 companies have been registered

Potential
(estimated investment)

168 billion €
/10 years ※2

※1: Total operating cost of major 10 utilities in Japan (roughly estimated)
※2: Estimated by Development Bank of Japan. This includes the investments for new power plants mainly by new entrants and for the system replacing.
II. Potential for Digitalization in Japan

1. Power Generation
   • Internet Of Things at power plants
     ⇒ Efficient operation & Failure prediction
     ⇒ 3.3 billion € / year (especially for the total potential of thermal power plants in Japan)

2. Transmission & Distribution
   • Drones
     ⇒ 6→3 maintenance staffs per cite (Transmission Tower)
     ⇒ Kumamoto earthquake (2016)
   • SCADA
     ⇒ smaller and more consolidated

3. Retail & Other services
   • Smart meters
     ⇒ 78 million units (2024, for all customers)
   • New services provided by utilities
     ⇒ Elderly Emergency Monitoring Service
     ⇒ Energy-saving service
   • New service from other industry
     ⇒ transport firms & utilities
     ⇒ utilizing smart meter data to infer whether recipient is home to increase efficiency of delivery
   • Performance
   • Temperature
   • Pressure
   • NOx, SOx...
Ⅲ. Digitalization Challenges

1. Safe and convenient environment for use of data

2. Development of human resources & awareness for data usage.

3. Technological advancement for data usage
IV. METI’s Policy Approach

1. Legal Reform
   - Deregulation for the firms making use of IoT technology in electricity safety
     ⇒ ex. Expand the interval of legal inspection from every two year to every 4 years for plants equipped with digital surveillance system and O&M

2. Data Sharing
   - Establishing Electricity Information Sharing and Analysis Center (JE-ISAC) with FEPCO from April 2017
     ⇒ Cybersecurity information
   - Trying to establish a system for data sharing (ex. Operational data)

3. New ISO & BoK
   - Trying to help Japanese utilities to establish;
     ⇒ ISO & BoK about Electric Power Infrastructure O&M (especially for digitalization)

4. Demonstration experiment
   - Trying to help Japanese utilities to use AI technology in Power Plants

Promoting digitalization

- FEPCO: The Federation of Electric Power Companies of Japan
- TEPCO: Tokyo Electric Power Company
- ISO: International Organization for Standardization
- BoK: Body of Knowledge
- O&M: Operation and Maintenance