

CHALLENGES AND OPPORTUNITIES IN THE ERA OF DIGITALIZATION

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I . Electricity Market situation in Japan

Negative

1. Aging facilities

- Over **60%** of Transmission towers
⇒ **> 40 years old**
- Over **50%** of Transformers
⇒ **20-25 years old**

Cost
143 billion €
/year ※1

2. Aging population

- Lack of young workforce

Greater efficiency and cost savings are necessary
How can we turn these problems into opportunities

Positive

3. Digitalization

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

Potential
(estimated investment)
168 billion €
/10 years ※2

4. Market Reform

- Liberalization
⇒ retail sales and generation (from **April 2016**)
- New entrants
⇒ **380 companies** have been registered

※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)



- Performance
- Temperature
- Pressure
- NOx, SOx
- ...

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 a 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**



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

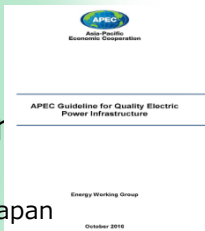
- Establishing Electricity Information Sharing and Analysis Center (**JE-ISAC**) with FEPCO from **April 2017~**
⇒ **Cybersecurity information**
- Trying to establish a system for data sharing (ex. Operational data)

3. New ISO & BoK

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

- 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

Promoting digitalization



4. Demonstration experiment

- Trying to help Japanese utilities to use **AI technology** in Power Plants

