Electricity market reform in Japan

October, 2014

Electricity Market Reform Office
Agency for Natural Resources and Energy (ANRE)
## History of Reforms in Japan

No competition in the electricity market before 1995: 10 vertically integrated GEUs (General Electricity Utilities) dominated and controlled the market.

METI embarked a series of reforms...

<table>
<thead>
<tr>
<th>No.</th>
<th>Year enforced</th>
<th>Overview</th>
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</table>
| 1   | 1995          | • Open the IPP (Independent Power Producer) market  
|     |               | • Allow specified-scaled and vertically integrated power generators                                                                   |
| 2   | 2000          | • Introduce partial retail competition  
|     |               | • Accounting separation of transmission/distribution sector                                                                          |
| 3   | 2005          | • Expand retail competition  
|     |               | • Establish the wholesale power exchange (JEPX) and its supporting body for transmission in wider areas                               |
| 4   | 2008          | • Modify the rule of wheeling rates...                                                                                                 |
Japan’s Electricity Market Outline

- 10 Vertically Integrated Power Companies (EPCOs) and New Entrance (PPSs)
  - Retail competition for over 50kW customers (62% of the market in 2013)
    - Share of non-EPCOs: 4.2% (2013)
    - 1.3% of the total retail market sales is transacted at JEPX (2013)
  - Average household electricity price was 21.26 yen/kWh before 3.11 (2011); 24.33 yen/kWh (2013) (24.81 yen/kWh in 1994)

- Frequency
  - West Japan: 60Hz
  - East Japan: 50Hz
  - Hokkaido (peak demand: about 5.7 GW) is connected by DC line.

*EPCO: Electricity Power Company
*PPS: Power Producers and Suppliers
*JEPX: Japan Electric Power Exchange
Problem revealed by 3.11

- Negative aspects of regional monopoly system with 10 big and vertically integrated EPCOs were revealed in the Great Earthquake 3 years ago:
  1. Lack of system to transmit electricity beyond regions
  2. Little competition and strong price control
  3. Limit in handling the change in energy mix including the increase in renewables

* DC – direct current, FC – frequency conversion
April 2, 2013, Cabinet decided the “Policy on Electricity System Reform” to realize three objectives in Japan’s market with a three-step approach.

**3 Objectives**

1. Securing a stable supply of electricity
2. Suppressing electricity rates to the maximum extent possible
3. Expanding choices for consumers and business opportunities

(Apr. 2, 2013, Cabinet Decision)

- **First Reform**
  - (1st Bill) 2013
  - Cabinet Decision on the Policy on Electricity System Reform

- **Second Reform**
  - (2nd Bill) 2014
  - The 1st Bill
  - The 2nd Bill
  - Establishment of the Organization for Cross-regional Coordination of Transmission Operators (OCCTO)

- **Third Reform**
  - (3rd Bill) 2015
  - Full retail competition
  - Period of transitional arrangement for retail tariff
  - Abolishment of retail tariff
  - Legal unbundling of transmission/distribution sector

(※At around 2015: Transition to new regulatory organizations)

The 2nd Bill

Jun. 11, 2014

The 3rd Bill

2018-2020
1st step: Establish the OCCTO

• Establish the Organization for Cross-regional Coordination of Transmission Operators (OCCTO) in 2015

- Main functions of OCCTO
  1. Aggregate and analyze the EPCO’s supply-demand plans and grid plans, and order to change EPCO’s plans such as tie lines construction
  2. Order EPCOs to reinforce generations and power interchanges under a tight supply-demand situation

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* DC – direct current, FC – frequency conversion, TDSO – Transmission and Distribution System Operator
2\textsuperscript{nd} step: Full Retail Competition

- Expand retail competition to the residential sector in 2016, opening a new market
- Maintain regulated tariffs to 10 big EPCOs at around 2018-2020

**Liberalized Sector**

- Large factory
- Large building
- Medium factory
- Small Factory

Share of total power: 63%

**Regulated Sector**

- Small shop
- Residential Customer

Market Volume: ¥7.5 trillion (=$ 75bn, € 54bn)

Number of contracts
- Residential Customers: 76.8m
- Small shops and offices: 7.4m

Share of total power: 37%
Revision of Business License Categories

- Business License categories under the Electricity Business Act, such as “General Electricity Utilities (GEU)” and “Wholesale Electricity Utilities”, will be revised in line with the full retail choice.

<table>
<thead>
<tr>
<th>Current categories</th>
<th>New categories (after 2016)</th>
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<tbody>
<tr>
<td><strong>GEU (10 EPCOs)</strong></td>
<td>• Supply for customers, including those in regulated sector with obligation to supply, regional monopoly and rate regulation</td>
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<tr>
<td></td>
<td>• Secure stable frequency and voltage</td>
</tr>
<tr>
<td><strong>PPS (Power Producer and Supplier)</strong></td>
<td>• Supply for customers in liberalized sector (more than 50kW)</td>
</tr>
<tr>
<td><strong>Wholesale Electricity Utilities, etc</strong></td>
<td>• Supply for GEU</td>
</tr>
</tbody>
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**Obtain 3 licenses** (not necessary to change corporate organization)

**Notification**
- Regulation based on the level playing field of competition

**Permission**
- Operate and maintain transmission/distribution lines
- Regional monopoly and rate regulation

**Registration**
- Supply for customers
- Obligation to secure the capacity of power supply
- Regulation based on the level playing field of competition
3rd step: Unbundle the T/D sector

- Unbundle the transmission/distribution sectors of big EPCOs by legal unbundling style at around 2018-2020

<Note>

✓ Big EPCOs will be required to unbundle transmission and distribution companies from generation ones or retail ones, in “legal unbundling.”
✓ Both the holding company style and the affiliated company style, in which a generation and retail company has a transmission and distribution company as a subsidiary company, are allowed.

The 3rd Bill (will submit in 2015)
Future Design of Japan’s Electricity Market

**Generation companies**

- Contract with retailer to sell electricity

**Transmission/Distribution companies**

- Regional monopoly, tariff regulation
- Wheeling contract

**Retailers**

- Not necessary to have assets
- Retail contract with consumers

**Consumers**

- Large factory
- Large building
- Building
- Medium factory
- Small factory
- Shop
- Household

- Super high voltage substation: 220-500kV
- Primary substation: 154-220kV
- Substation for distribution: 66kV
- Meter: 100/200V, 6.6kV, 6.6-154kV

**Jordan Export Power Exchange (JEPX)**