Electricity market reform in Japan

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Electricity Market Reform Office
Agency for Natural Resources and Energy (ANRE)

Ministry of Economy, Trade and Industry

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 series of reforms...

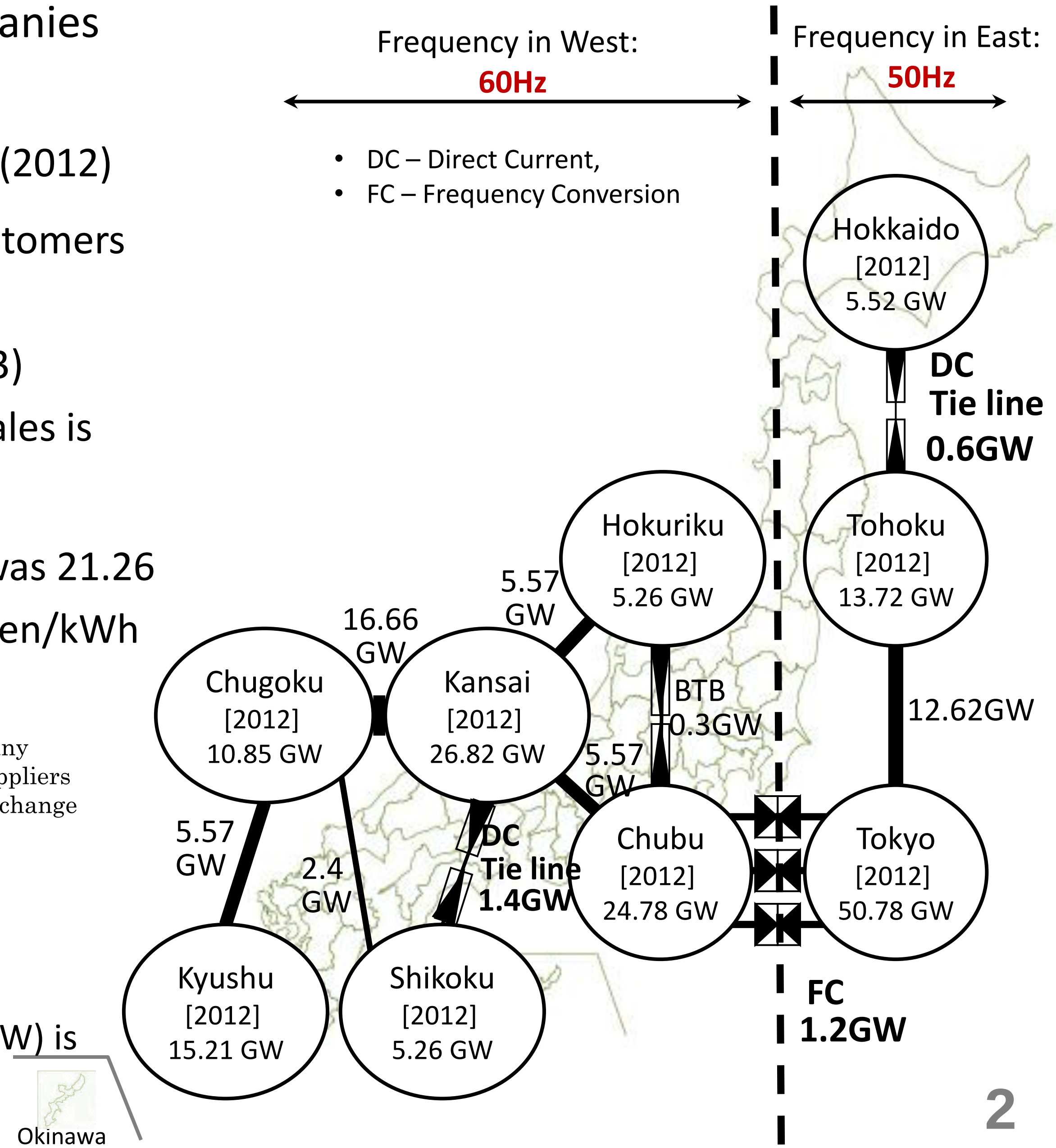
No.	Year enforced	Overview
1	1995	• Open the IPP (Independent Power Producer) market • Allow specified-scaled and vertically integrated power generators
2	2000	• Introduce partial retail competition • Accounting separation of transmission/distribution sector
3	2005	• Expand retail competition • Establish 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)
  - ➢ Market volume: 1094TWh / 287 GW (2012)
  - ➢ 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)

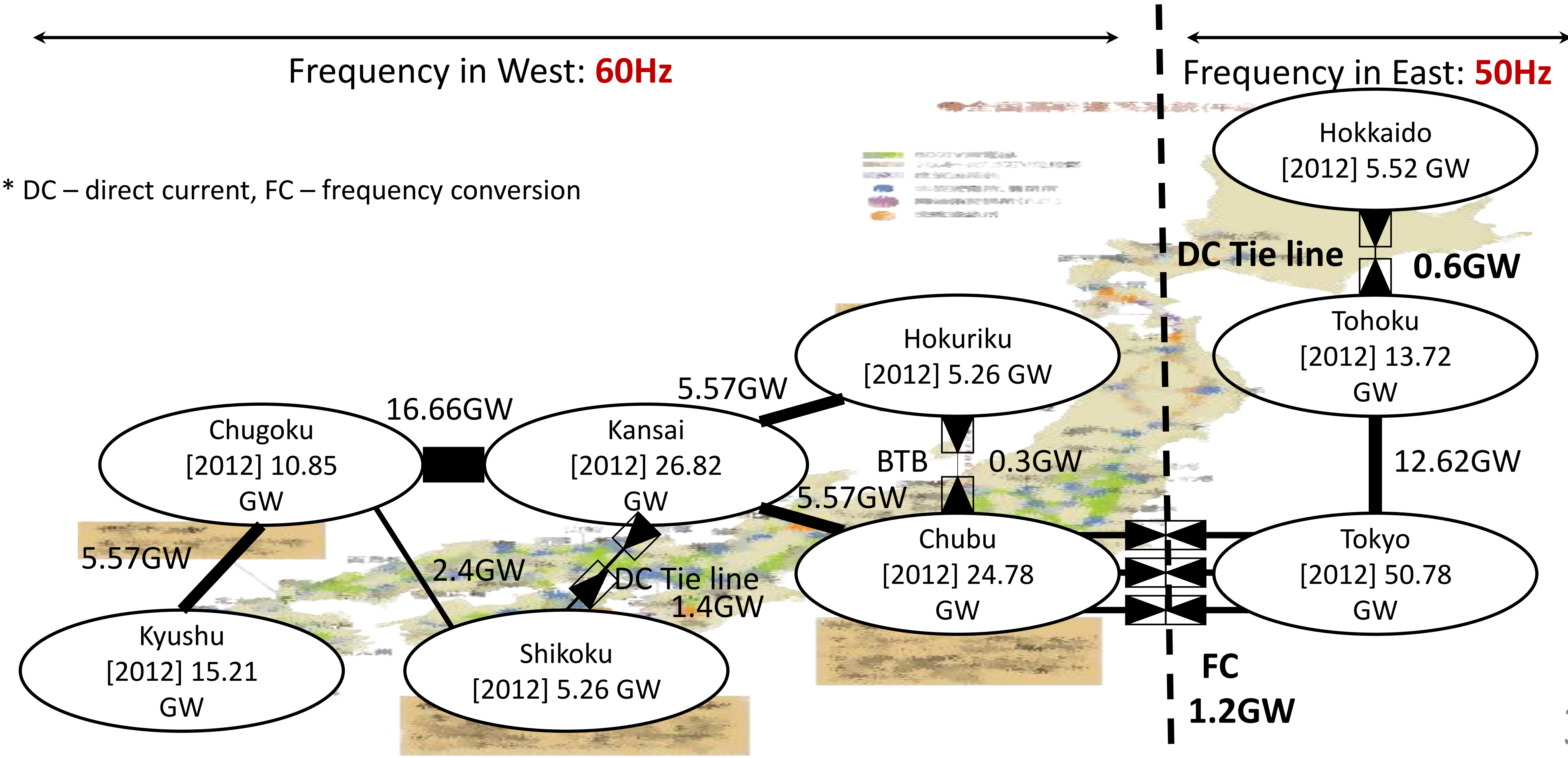
*EPCO: Electricity Power Company
*PPS: Power Producers and Suppliers
*JEPX: Japan Electric Power Exchange

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



Problem revealed by 3.11

- Negative aspects of regional monopoly system with 10 big and vertically integrated EPCOs were revealed in the Great Earthquake 3years 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

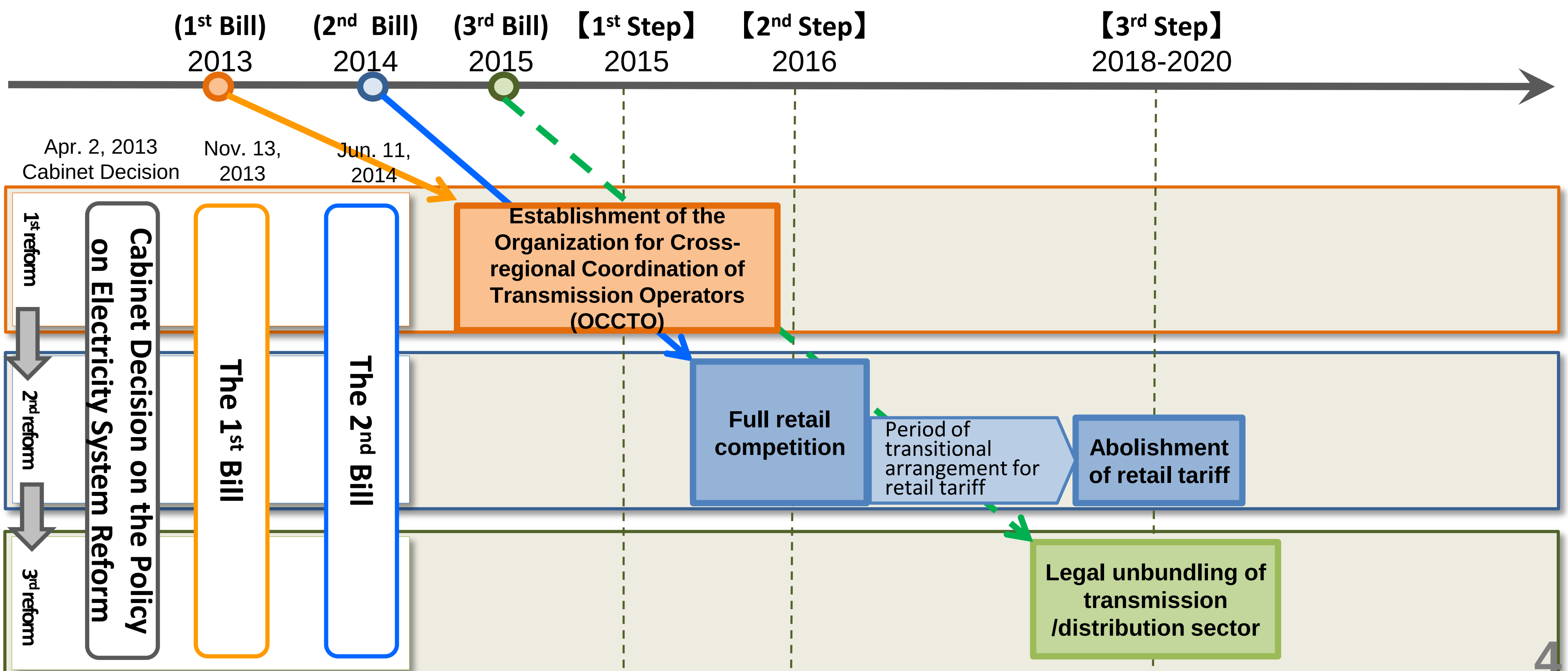


Electricity Market Reform in Japan: Roadmap

- 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

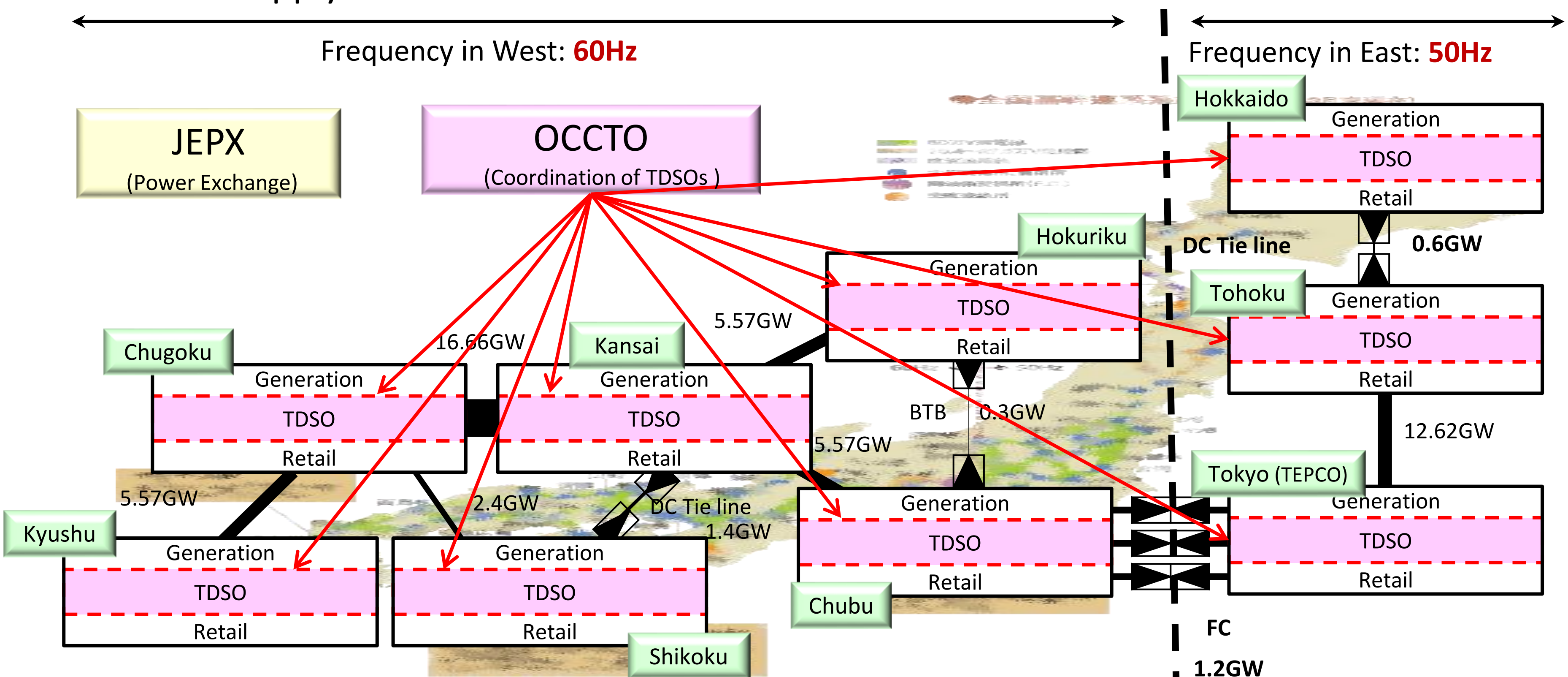


(※At around 2015:Transition to new regulatory organizations)

1st step: Establish the OCCTO

The 1st Bill

- 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



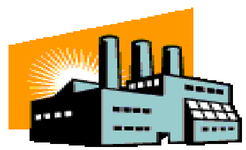
* DC – direct current, FC – frequency conversion, TDSO – Transmission and Distribution System Operator

2nd step: Full Retail Competition

The 2nd Bill

- 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
(50kW～)



Large factory
Large building

Building
Medium factory

Small Factory

Share of total power: 63%

Regulated Sector
(～50kW)

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%

Small shop

Residential Customer

Revision of Business License Categories

The 2nd Bill

- 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.

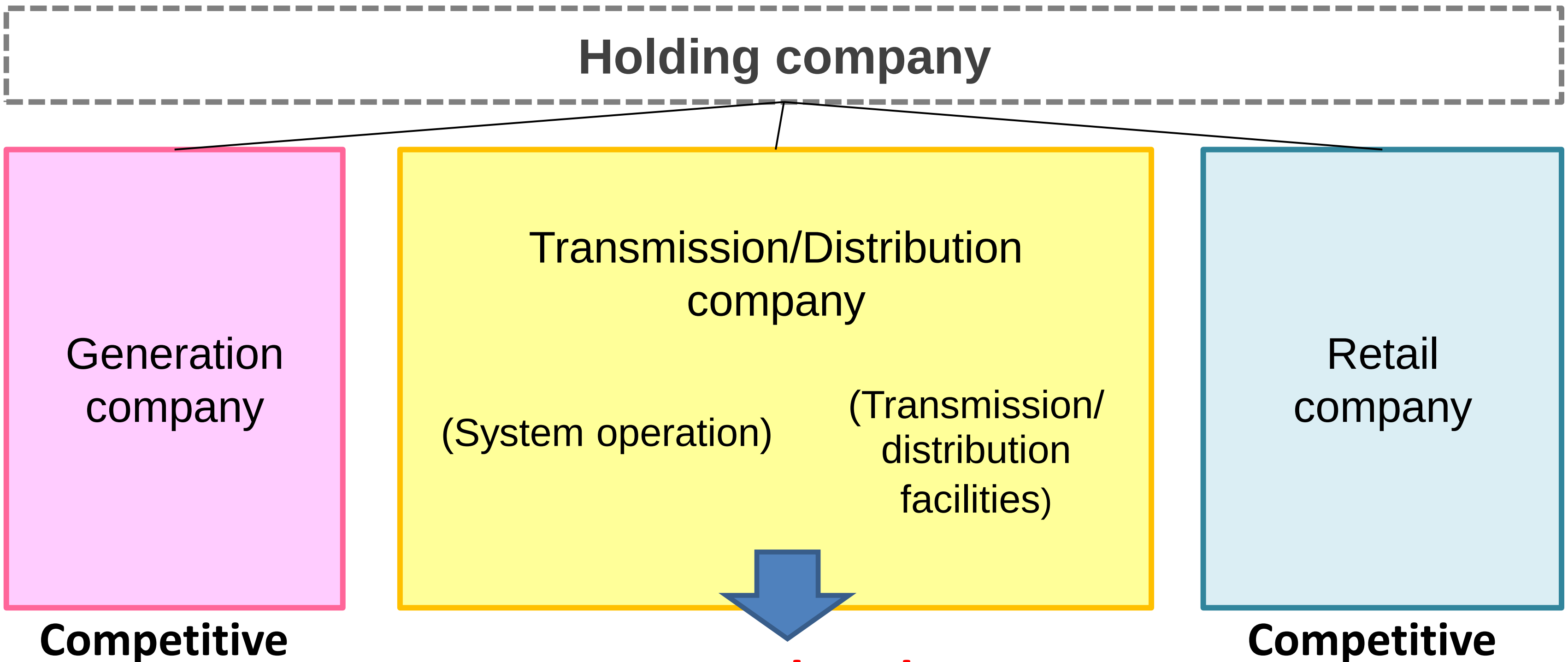
Current categories		New categories (after 2016)
GEU (10EPCOs)	● Supply for customers, including those in regulated sector with obligation to supply, regional monopoly and rate regulation ● Secure stable frequency and voltage	Obtain 3 licenses (not necessary to change corporate organization): Generation / Transmission & Distribution / Retail
PPS (Power Producer and Supplier)	● Supply for customers in liberalized sector (more than 50kW)	Generation / Retail
Wholesale Electricity Utilities, etc	● Supply for GEU	Generation

【Notification】	【Permission】	【Registration】
● Regulation based on the level playing field of competition	● Operate and maintain transmission /distribution lines ● Regional monopoly and rate regulation	● 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

The 3rd Bill
(will submit in 2015)

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



Regulated

- Regional monopoly
- Network tariff
- Responsibility for maintaining frequency & providing LR service
- Code of conduct

<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.

Future Design of Japan’s Electricity Market