

Japan's Energy Industry Shakeup

~ What it means for US Cleantech Companies ~

Yoshiaki TOJO

JETRO San Francisco

1. Japanese Energy Market at a Glance

Post Fukushima Transformation of \$160+bn Market

2. Regulatory Reform & Feed-in Tariff

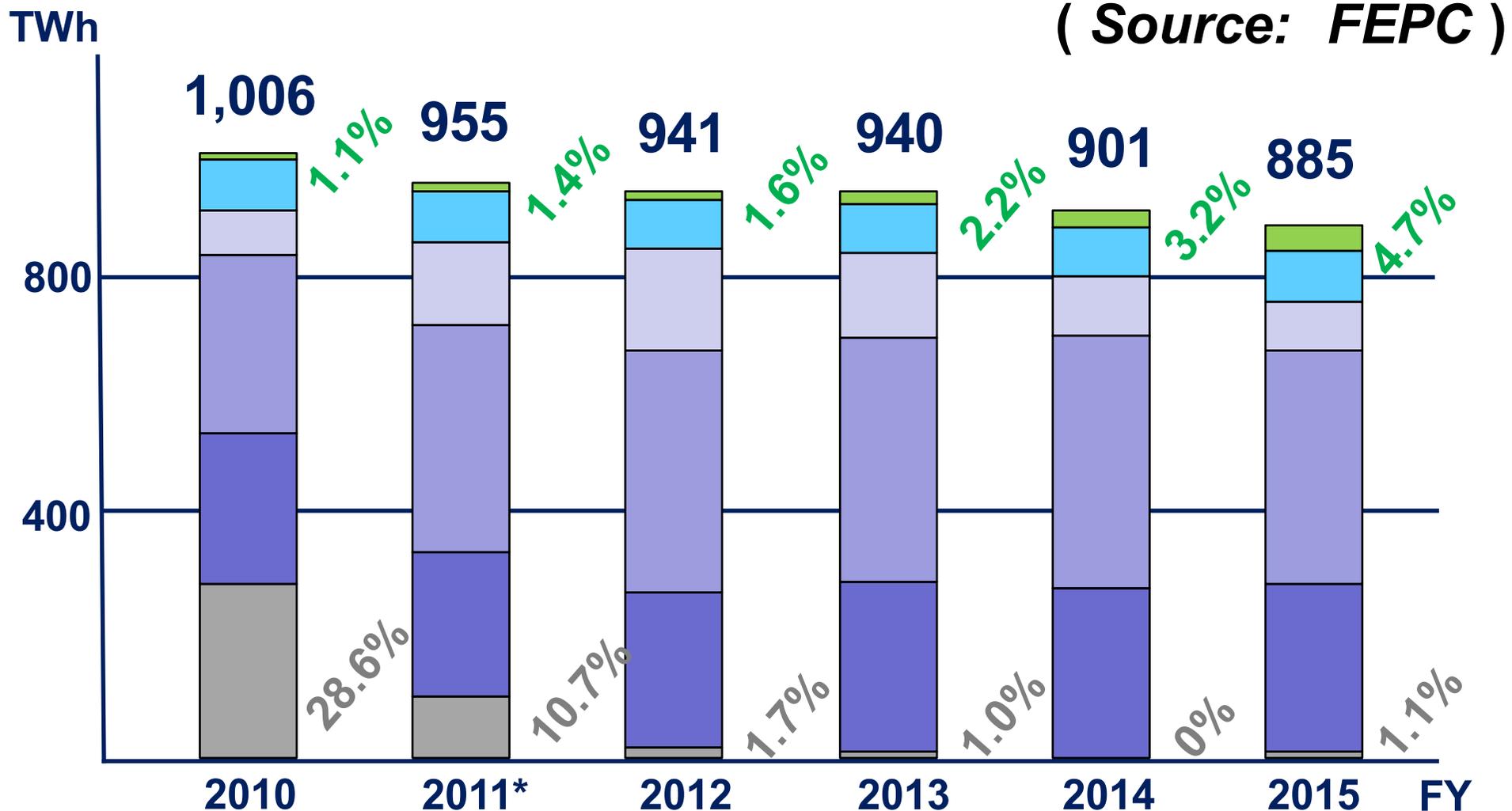
Liberalization of Electricity & Gas

Feed-in Tariff Boosting Renewable Energy Deployment

3. JETRO is here for your assistance

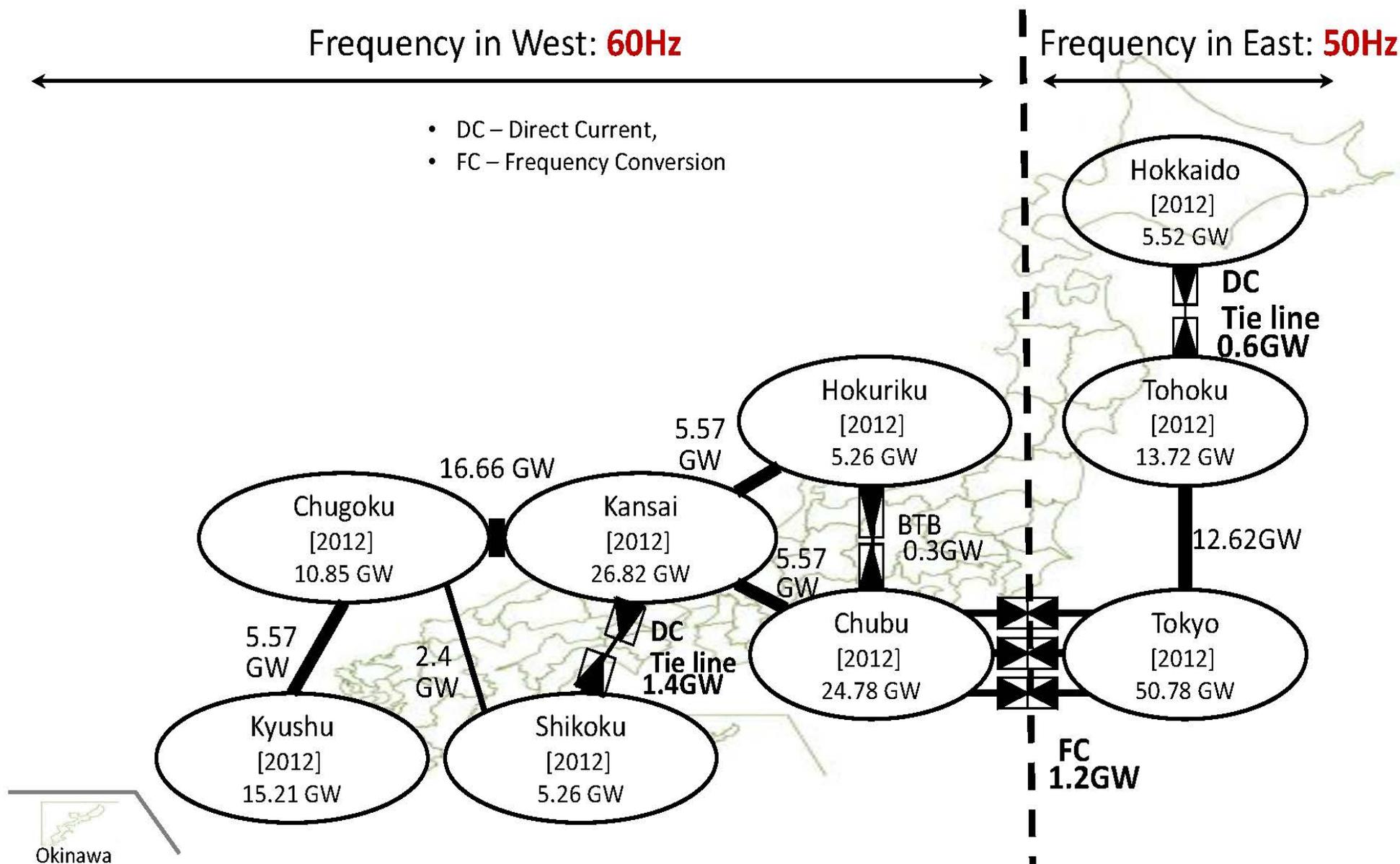
Electric Power Generated by Source Type

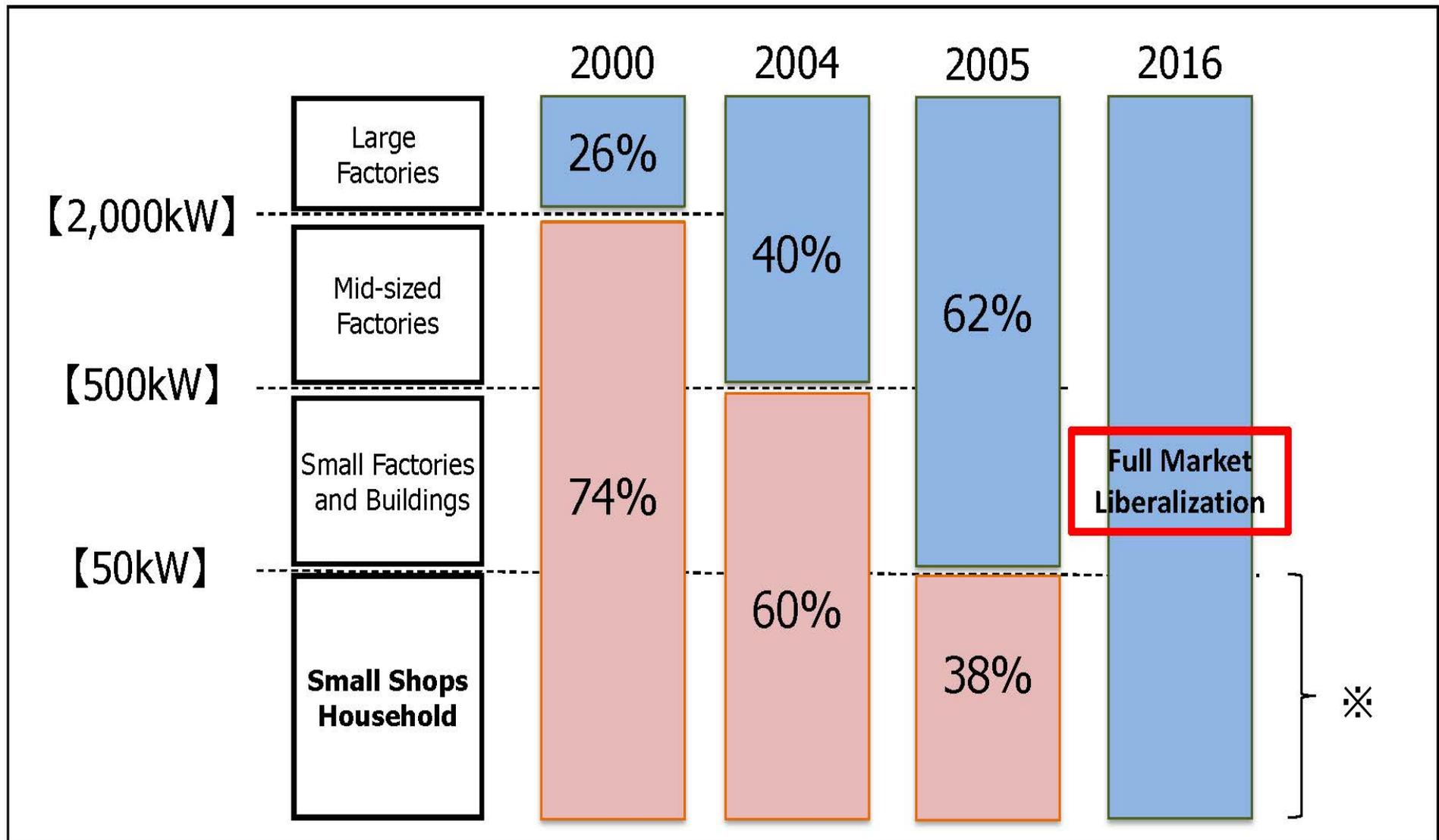
(Source: FEPC)



(*) Fukushima disaster happens in March 2011.

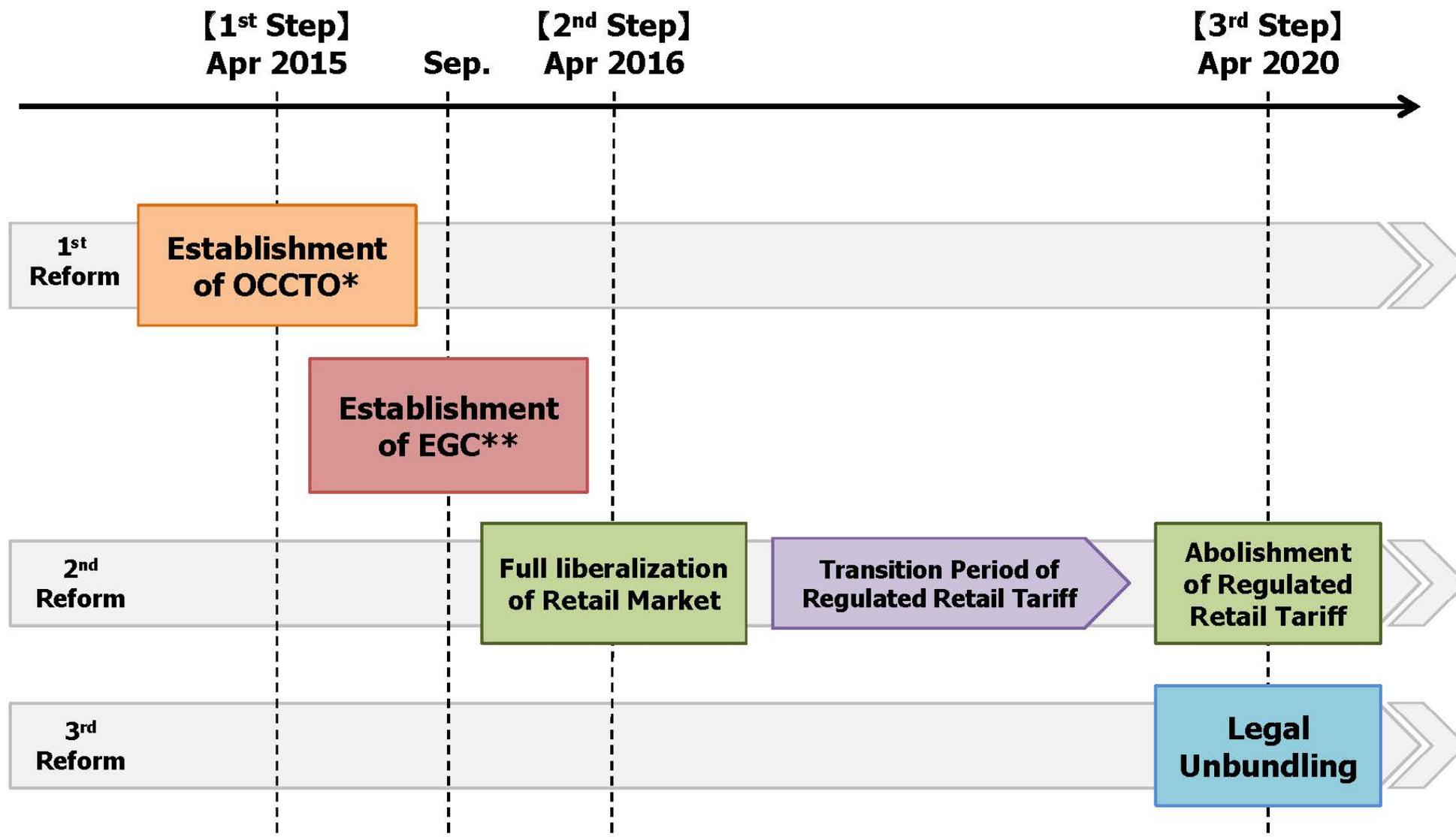
- Nuclear
 - Coal
 - LNG
 - Petroleum
 - Hydro
 - Other Renewables
- (Apr-Mar)





※ Regulated tariffs will be maintained as an option for customers at least until 2020.

- **Secure stable supply of electricity by facilitating power interchange between regions.**
- **Hold down increasing tariffs as much as possible.**
- **Increase consumer's choice while expanding business opportunities.**

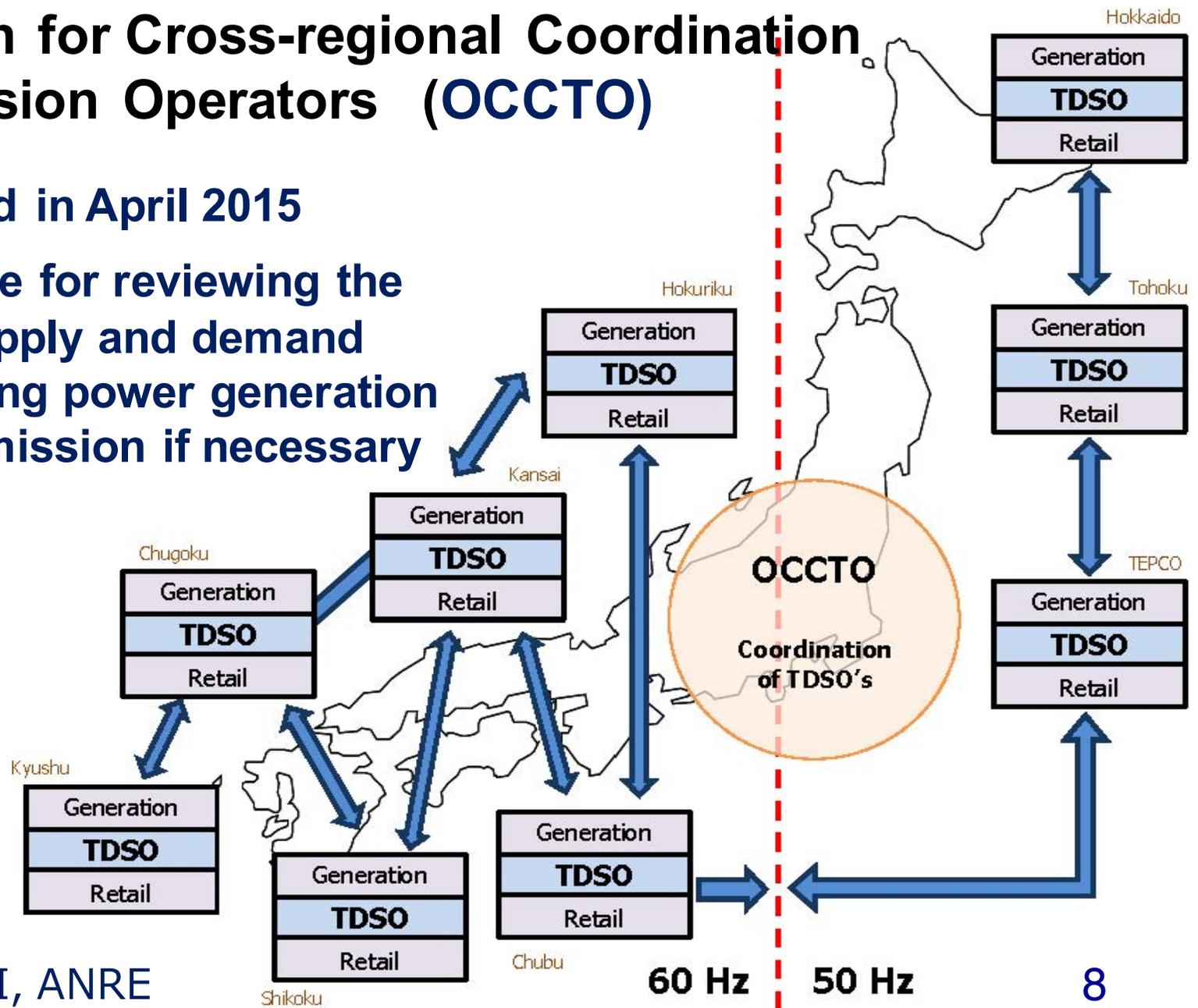


* The Organization of Cross-regional Coordination of Transmission Operators

** Electricity and Gas Market Surveillance Commission

Organization for Cross-regional Coordination of Transmission Operators (OCCTO)

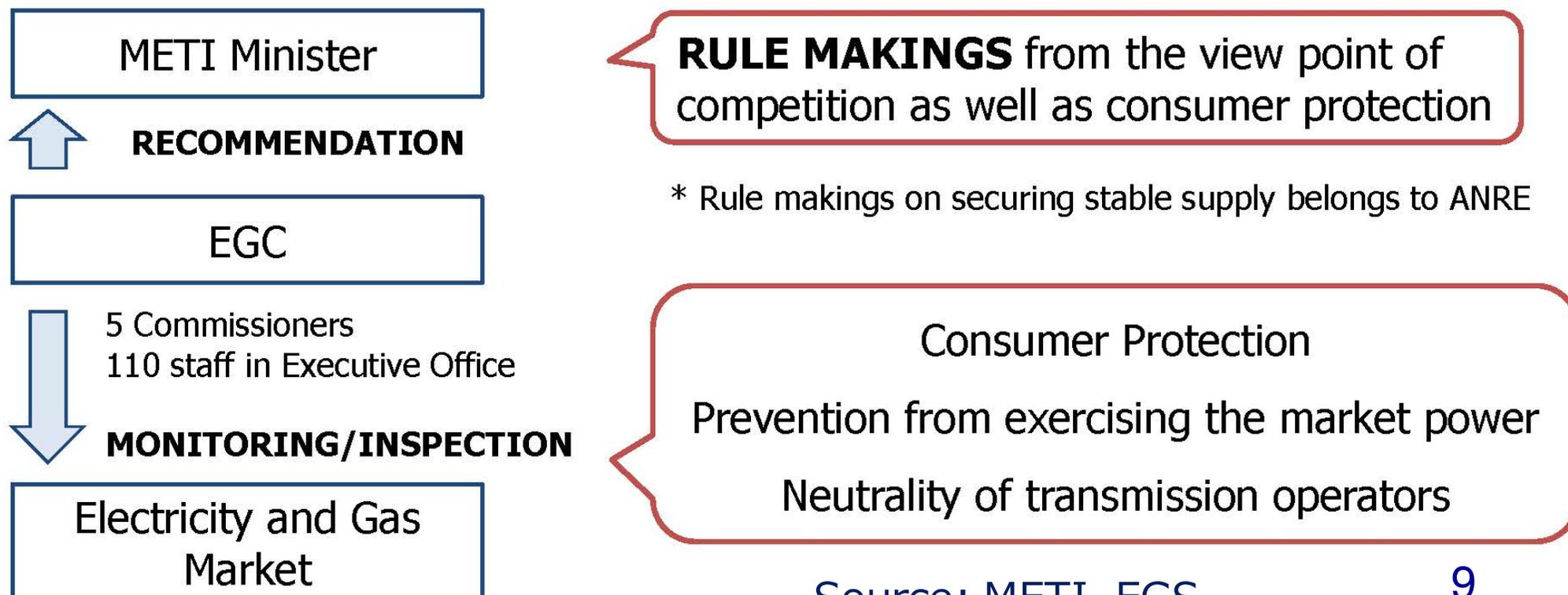
- established in April 2015
- responsible for reviewing the EPCOs supply and demand and ordering power generation and transmission if necessary

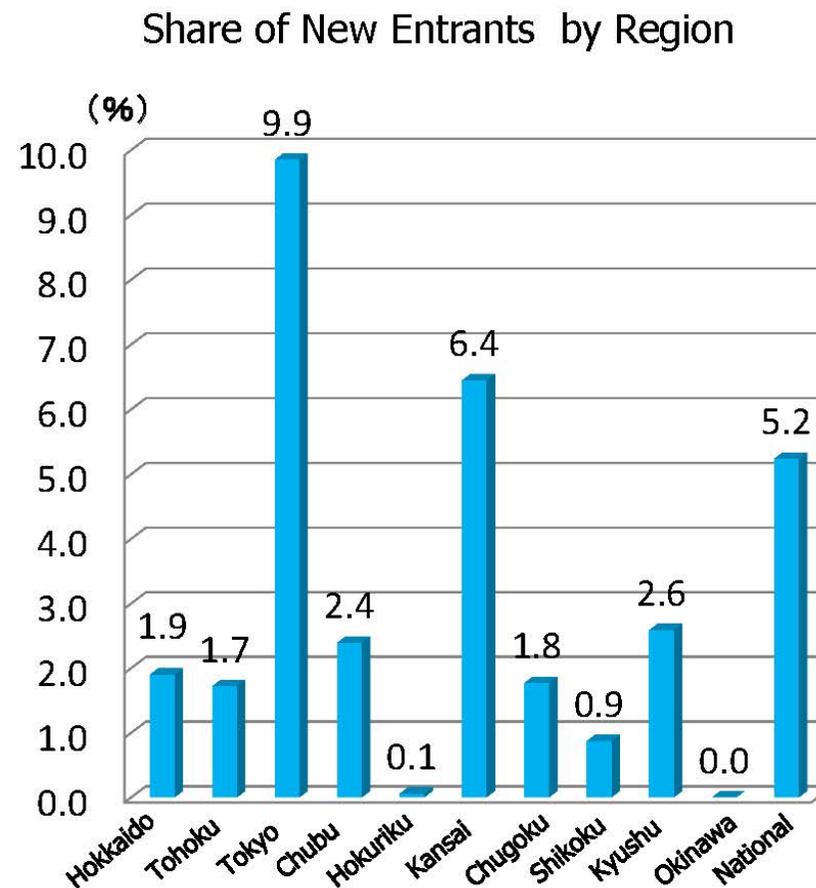
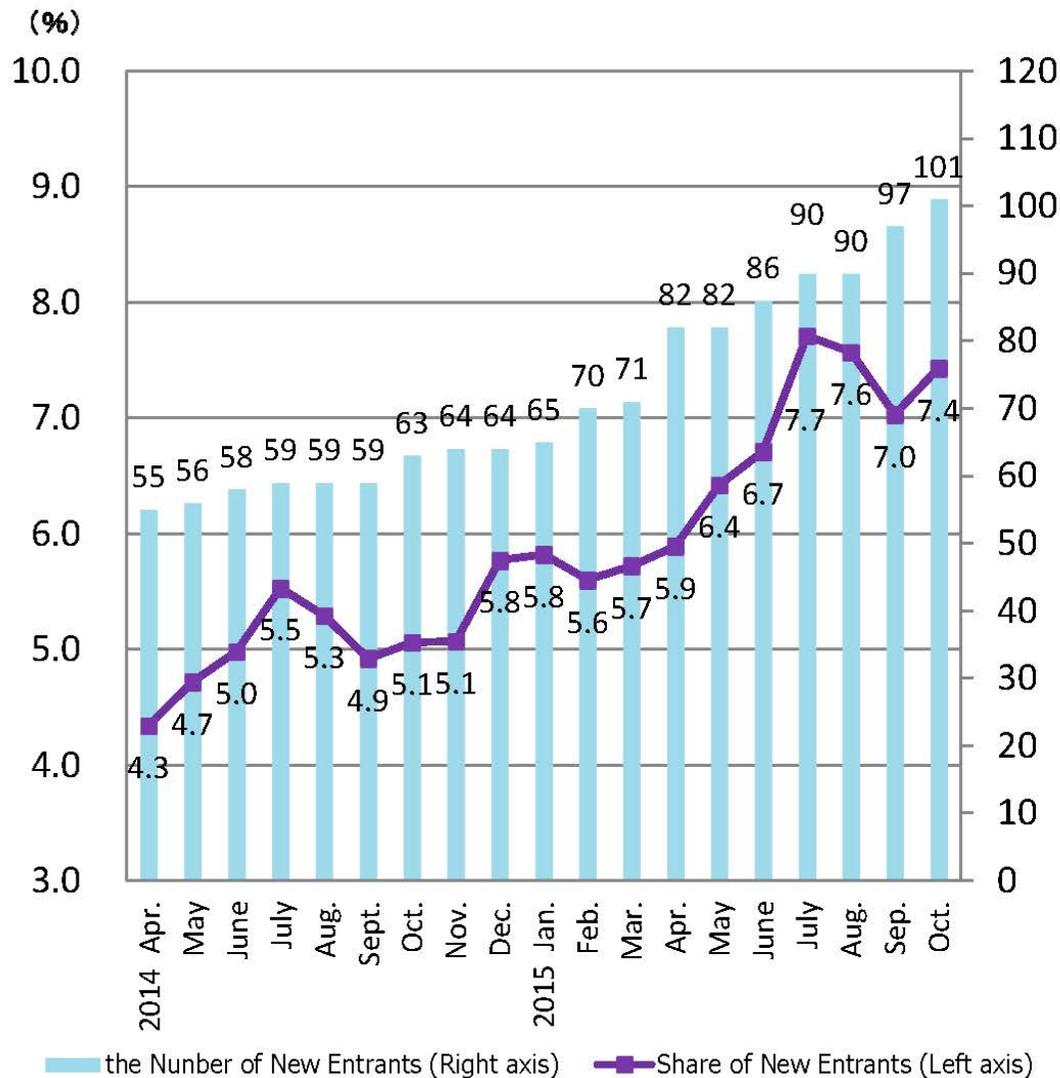


Electricity and Gas Market Surveillance Commission (EGC)

The Commission was established as EMSC in September 2015 in order to urge sound competition in the electricity market

EGC also started to watch gas and heat markets from April 2016





Source: METI, EGS

- Non-EPCO companies announced to enter the power retail market after 2016
 - Gas company : electricity + gas,
 - Telecom company : telecom + electricity, etc.
- Big EPCOs announced to start preparing for offering power retail business in other EPCOs' regions.
- Non-EPCO Companies start making new investments in power generation
 - KOBELCO: 1.4GW (2019-2020), Saibu Gas: 1.6GW (2020), Ohgishima Power: 0.4GW (2016), etc.
- EPCOs promote partnership
 - Tokyo EPCO and Chubu EPCO formed a comprehensive partnership (JERA) to jointly procure fuel, operate related businesses (upstream investment, transportation and trading), construct and replace thermal power plants, etc.

Nearly **300** entrants from a variety of sectors already registered as retailers in this market

GAS / OIL

- Tokyo Gas
- Osaka Gas
- JX Nippon Oil
- Tonen General
- Showa Shell
- Idemitsu Kosan

EPCO / PPS

- EPCO's
- Ennet Corporation
- F-Power
- eRex
- Marubeni Mitsui Group

TELECOM / RAILWAY

- Softbank
- KDDI
- J:COM
- Tokyu Power Supply

RENEWABLE / LOCAL / OTHER

- Maniwa Bioenergy
- Green Circle
- Loop
- Local Prefectures
- H.I.S

The FULL list is available on METI's site, however it is in Japanese at the moment.

EREX CO., LTD. – SPARK ENERGY

In August 2015, Texas energy company, Spark Energy, formed a strategic partnership with Japanese energy company eRex Co., Ltd, to form eRex Spark Marketing Co. Ltd.

In February 2016, eRex Spark Marketing Co., Ltd. enters a new service agreement with Kanematsu Corporation and Tanita Health Link, Inc. to provide sale of electricity power for residential use.

HITACHI – ABB

In October 2015, Leading power and automation technology group announced the completion of a joint venture company with Hitachi, named Hitachi ABB HVDC Technologies.

Given the need to strengthen and better integrate the different electrical systems in Japan, the use of High Voltage Direct Current (HVDC) transmission is expected to increase, especially in the regional interconnections for transmission grid and grid connections for renewable energy (i.e., offshore wind).

SKIPPING STONE - TEPCO

Skipping Stone, an energy consultancy, partnered up with TEPCO to manage its Open Innovation Program, a clearing house for receiving applications to enter Japan's electric energy markets

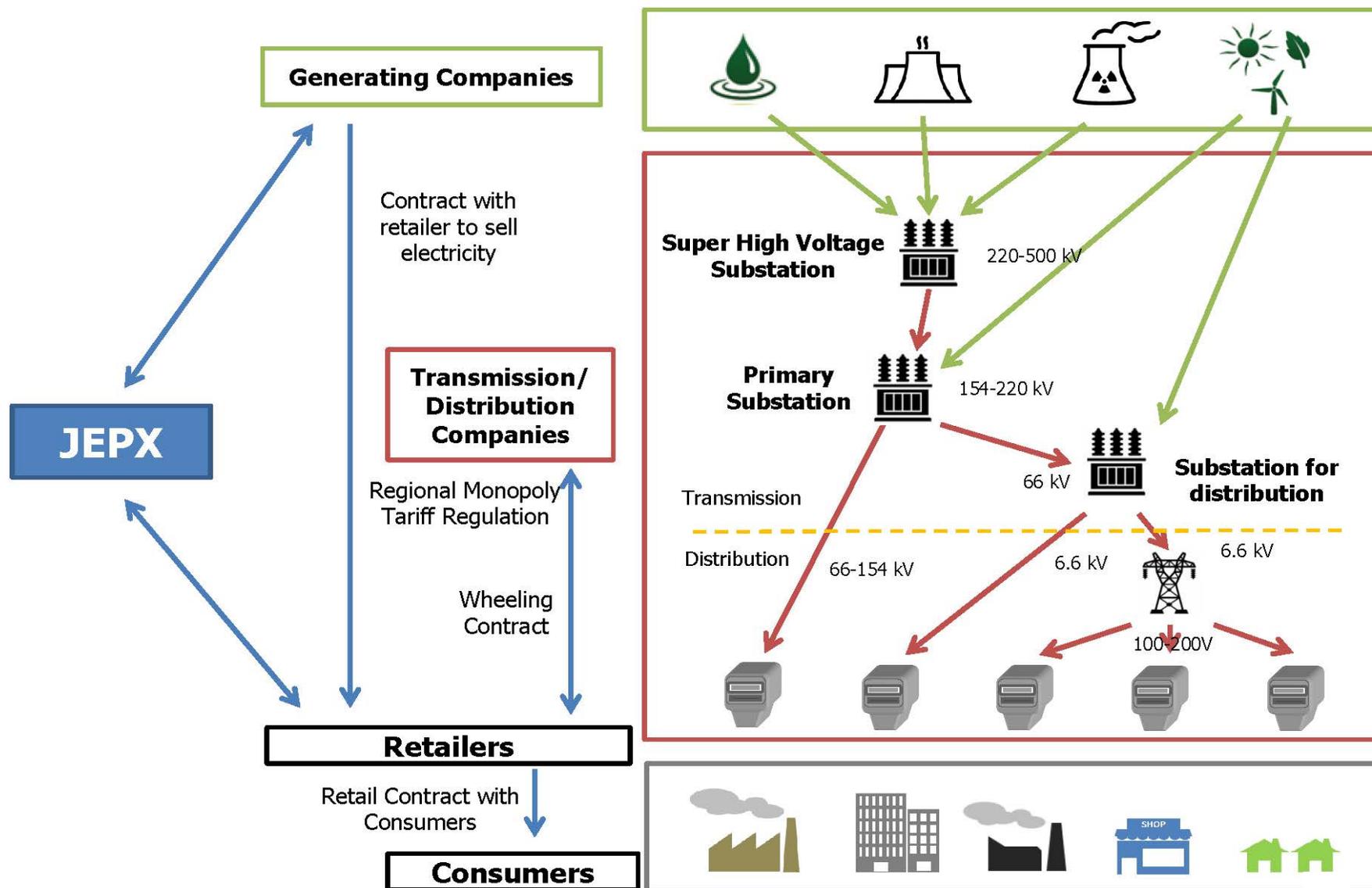
ITOCHU CORP – GREEN CHARGE NETWORK

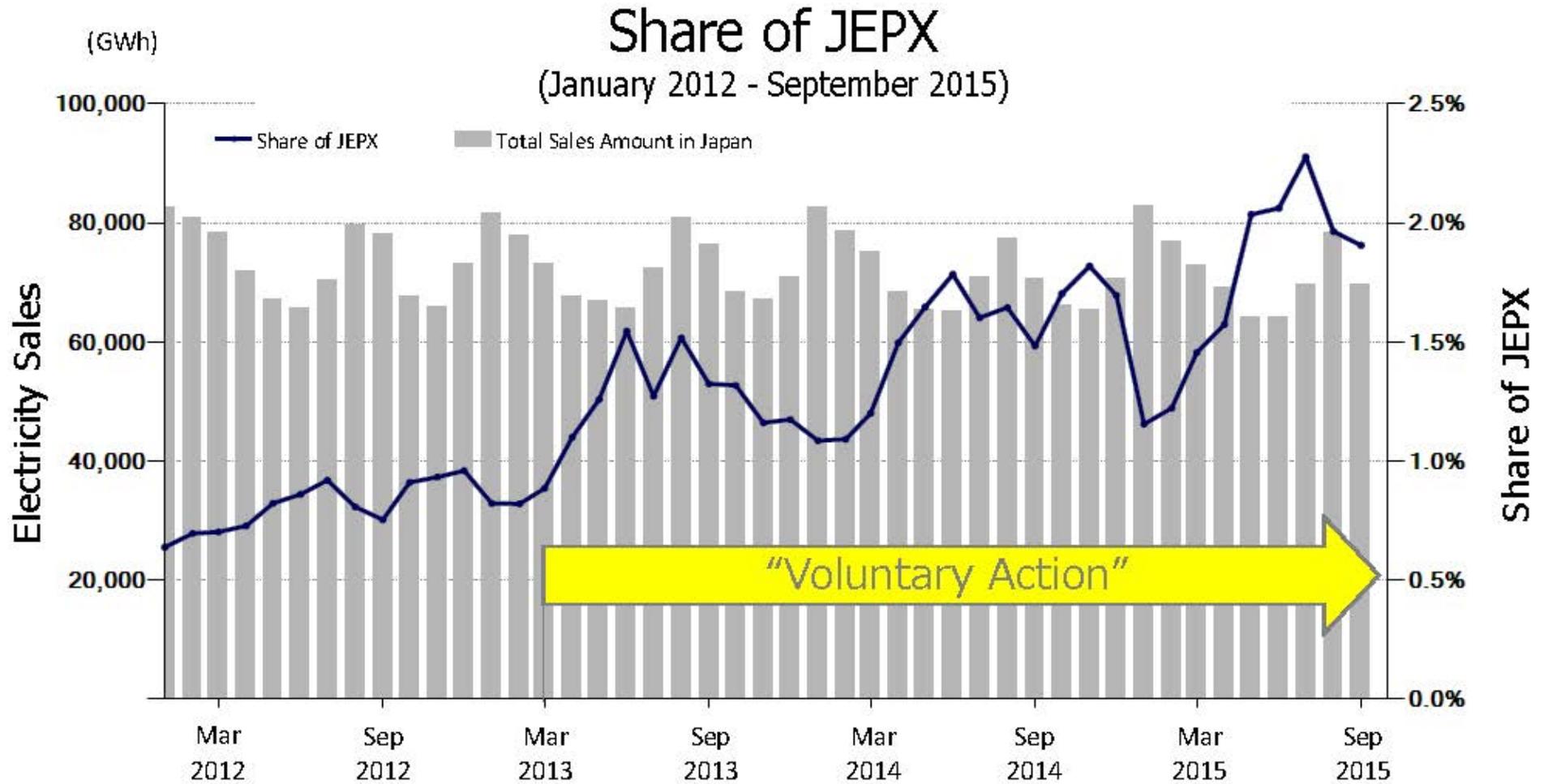
In March 2015, Itochu decided to acquire a minority stake in Green Charge Network, a California based company that specializes in energy storage systems, as they see the smart home management system become more common.

SOLAR POWER NETWORK

Toronto based Solar Power Network entered Japan by designing, operating, building, and operating roof top solar systems in Japan. Having the success with partnering with various Japanese companies, they expect to install approximately 60MW of solar on roof tops.

2% of total sales amount is traded at JEPX





Source: METI, EGS

Smart meters will be installed for all customers including households by FY2020 in Tokyo and by FY2024 nationwide.

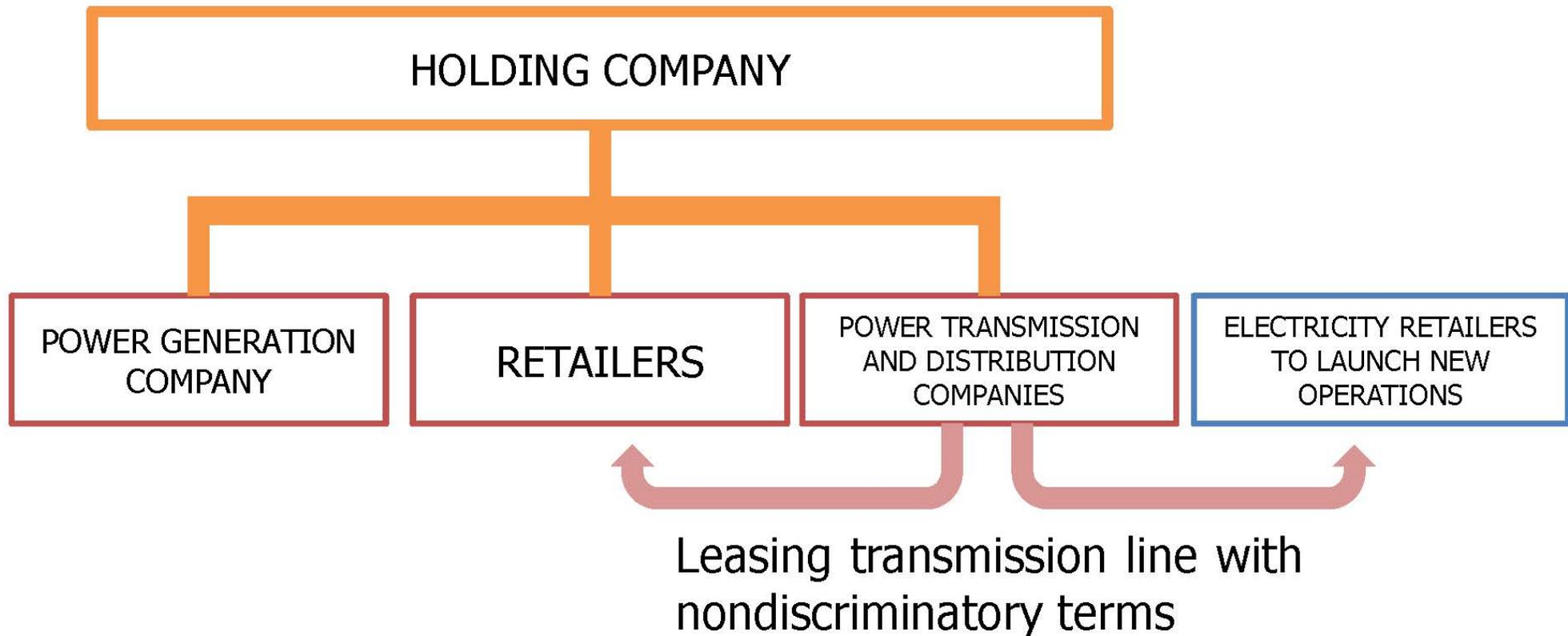
Transmission/distribution companies will install smart meters promptly for customers who switch their retailers or introduce HEMS.



- ✓ Remote metering
- ✓ 30 min. power usage data
- ✓ Remote opening/closing

		Hokkaido	Tohoku	Tokyo	Chubu	Kansai	Hokuriku	Chugoku	Shikoku	Kyushu	Okinawa
High voltage	Installation will be completed in	2016	Completed	Completed	2016	2016	Completed	2016	2016	Completed	2016
Low voltage	Installation will be started in	Started	Started	Started	Started	Started	Started	2016	Started	2016	2016
	Installation will be completed in	2023	2023	2020	2022	2022	2023	2023	2023	2023	2024

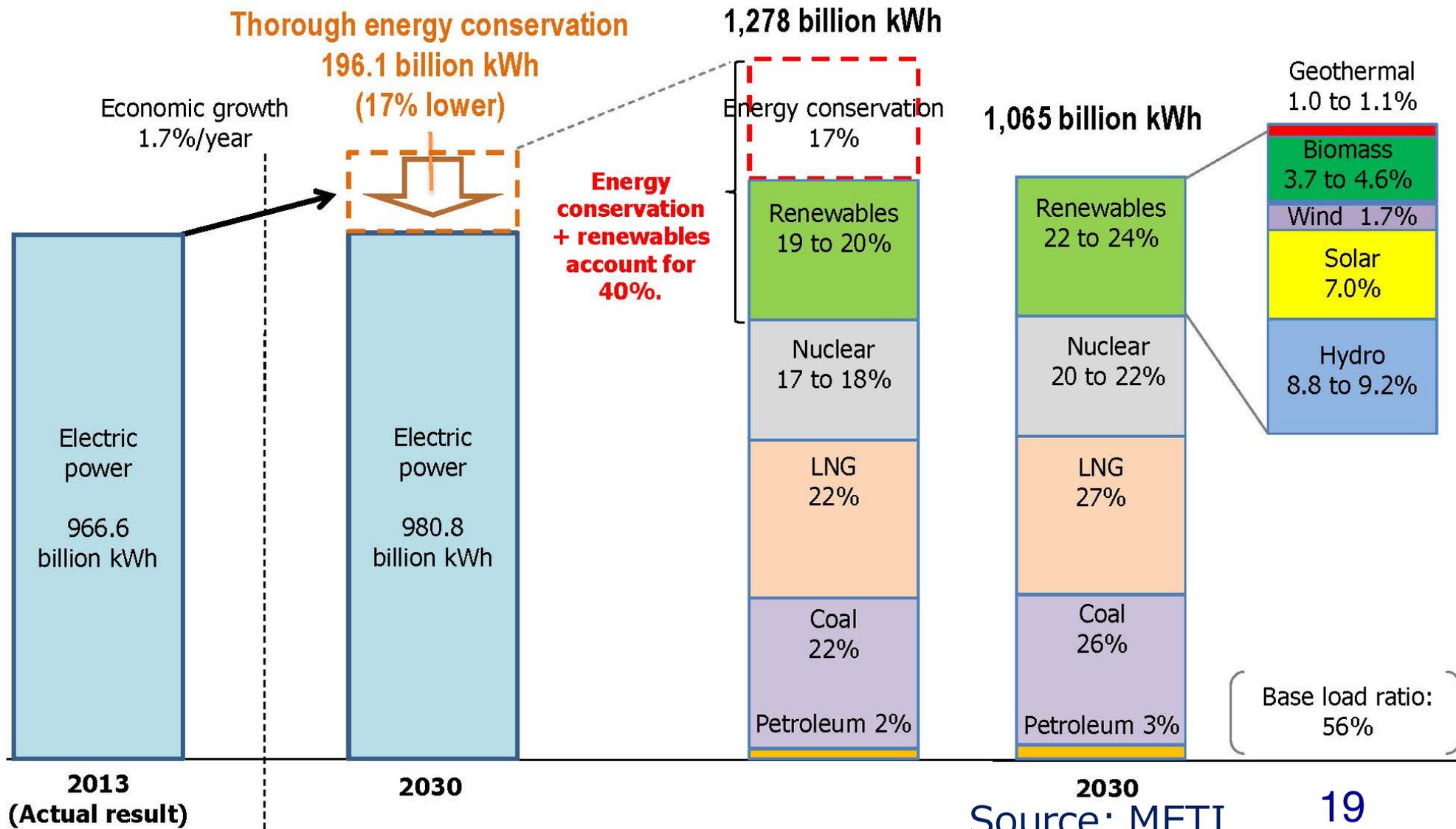
An example of the potential separation of power generation and power transmission to be implemented by large scale electric utilities



Power demand

Power source composition

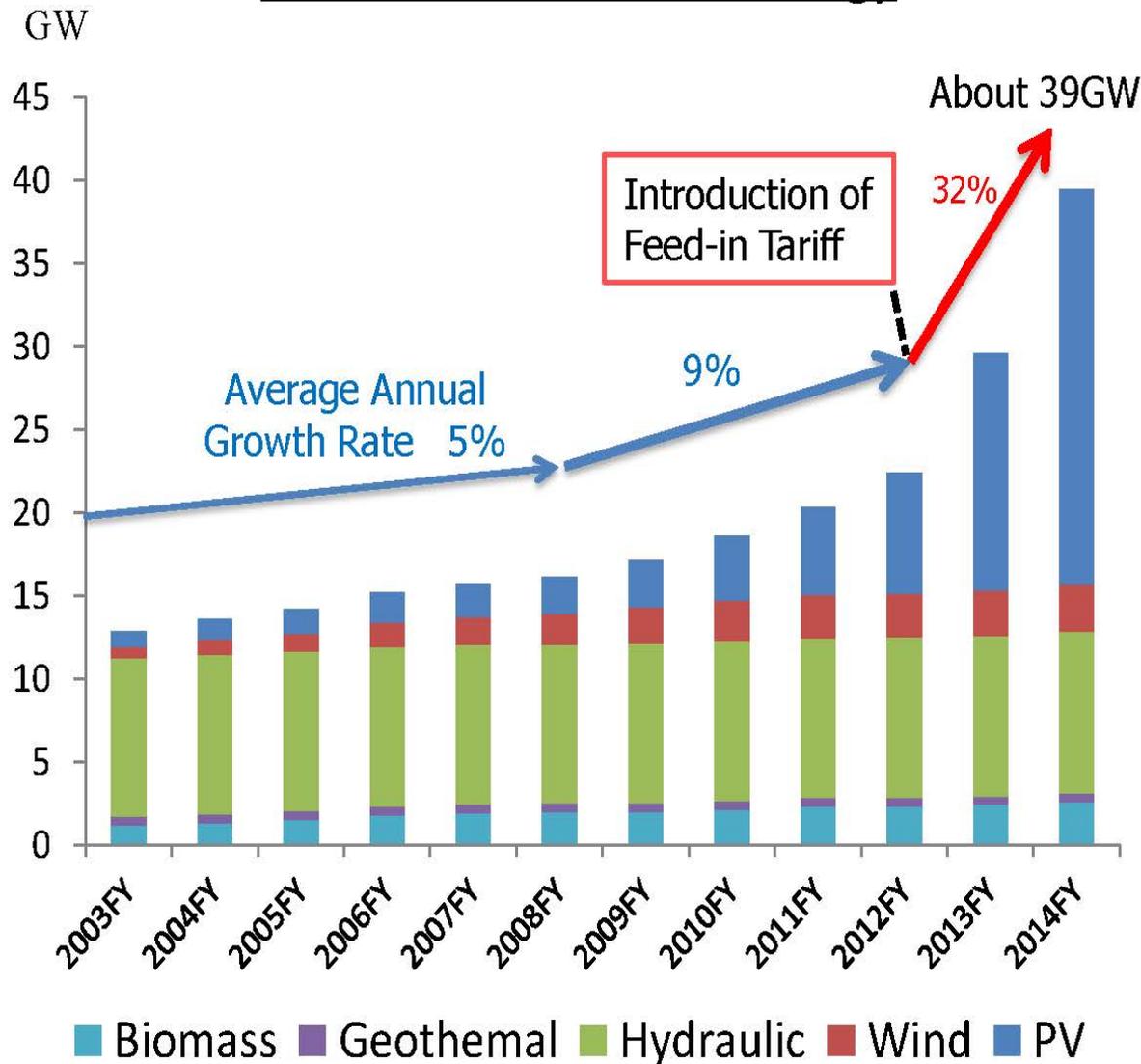
(Total generated energy)



Energy conservation + renewables account for 40%.

Base load ratio: 56%

Generated Renewable Energy



	Authorized (up to the end of 2014FY)	Already installed before 2014FY
PV (residential)	3.8GW	3.1GW
PV (non-residential)	78.8GW	15.0GW
Wind	2.3GW	0.3GW
Hydraulic	0.7GW	0.1GW
Geothermal	0.1GW	0.0GW
Biomass	2.0GW	0.2GW
Total	87.7GW	18.8GW

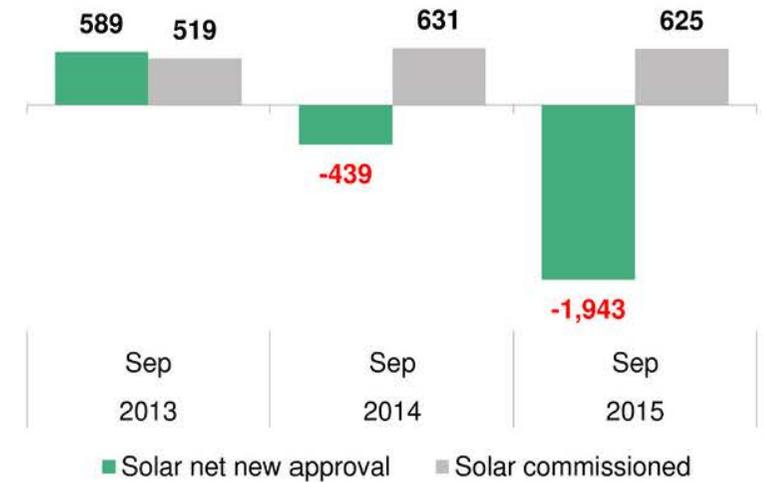
POLICY

On February 22, METI's FiT pricing committee proposed new FiT rates for FY2016. The rate for above 10kW solar has been reduced by 11.1% to JPY 24/kWh.

The latest monthly FiT statistics by METI showed November 2015 had net approved applications of -101MW (-338MW for above 1Mw segment) and commissioned capacity of 718MW.

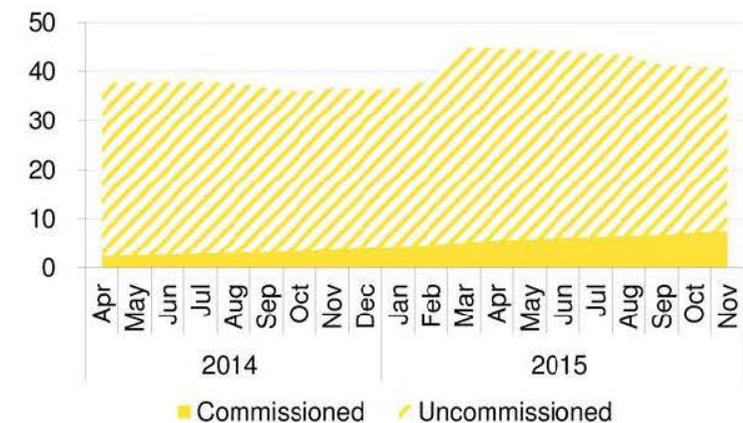
Q4 2015 also saw PV module shipment of 1,765MW, a 21.1% YoY decline.

SOLAR - NEW INSTALLS STEADY AS APPLICATIONS DIP



Source: Ministry of Economy, Trade and Industry, Bloomberg New Energy Finance

1MW+ SOLAR - COMMISSIONED VS. UNCOMMISSIONED CAPACITY (GW)



Source: Ministry of Economy, Trade and Industry, Bloomberg New Energy Finance

WIND

November 2015 had -4.5MW of net approved FiT application, only the second time cancellations had overwhelmed new application approvals. Only 4MW was commissioned in November.

In 2016, Bloomberg New Energy Finance expects 459MW of new installations. Japan's installation is likely to peak in 2018 when projects currently under the EIA process start to be commissioned.

Hokkaido leads in wind capacity at 397MW.

Obayashi Corporation considers building 455MW Offshore Wind project off the coast of Northern prefecture of Akita, amid a push by the local government to expand the use of clean energy.

Source: Bloomberg, METI

BIOMASS

In November 2015, 85MW worth of biomass capacity was commissioned, the largest amount since the FiT programme was launched.

IHI Corporation is promoting a method to increase the ration of woody biomass that's able to burn at coal-fired power plants.

Additional cost on retrofitting mills can be recouped in several years based on the FiT rates for biomass, which haven't changed like solar.

GEOHERMAL

In November 2015, 85MW worth of biomass capacity was commissioned, the largest amount since the FiT programme was launched.

Idemitsu Kosan began construction of a 5MW geothermal power plant in Japan's southwestern prefecture of Oita. The project will be one of the largest binary power plants in Japan.

- **Japan's electricity sector evolves after Fukushima disaster.**
- **Full liberalization of electricity market opens new business opportunities, while overall demand declining.**
- **Feed-in Tariff boosts Japanese renewables, including the second largest solar installation in 2014 & 2015.**

JETRO has supported more than 10,000 foreign companies in their entry and business expansion in the Japanese market.

We look forward to assisting you.

Talk to the JETRO first!

**Hiroyuki ISHIGE
Chairman & CEO of JETRO**



- ◆ **Invest Japan:**
 - ... assisting US companies at the first entry and business expansion in Japanese market
- ◆ **Business Match-Making:**
 - ... promoting US-Japan business partnership, especially for SMEs
- ◆ **Innovation Partnership:**
 - ... helping Japanese startups being connected to the US venture community
- ◆ **JETRO Seminars:**
 - ... providing updated information on Japanese business environment and policy measures

For any questions or additional information

JETRO San Francisco
575 Market Street, Suite 2400
San Francisco, CA 94105
415-392-1333
sfc-info@jetro.go.jp

This document is owned by JETRO. All of the content in this document, including, but not limited to, still images, text, pictorial works, designs and logos, is owned or licensed by JETRO. This document shall not be reproduced or reprinted on any medium or registered on any search system in whole or part by any means, without prior permission of JETRO. Although JETRO makes its best efforts to ensure the accuracy of the information contained in this document, JETRO does not take any responsibility regarding losses derived from the information contained in this document.