Tokyo Commodity Exchange

TOCOM's initiatives to establish Electricity Futures market in Japan

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Agenda

- **Introduction**
- **Japan's Electricity Market outline**
- **Framework for electricity futures contract and Global Electricity Futures Market**
- **Product design for TOCOM Electricity Futures Contract**

Our Plan

- The Tokyo Commodity Exchange, Inc. is preparing to create a single marketplace for energy, with futures contracts including electricity and LNG, following the government's "Growth Strategy 2017".

- With an expectation of listing in September 2018, electricity futures will be the first listed product for the new market. The contract specifications and other details for electricity futures will be finalized based on industry feedback and the consultation with the regulators.

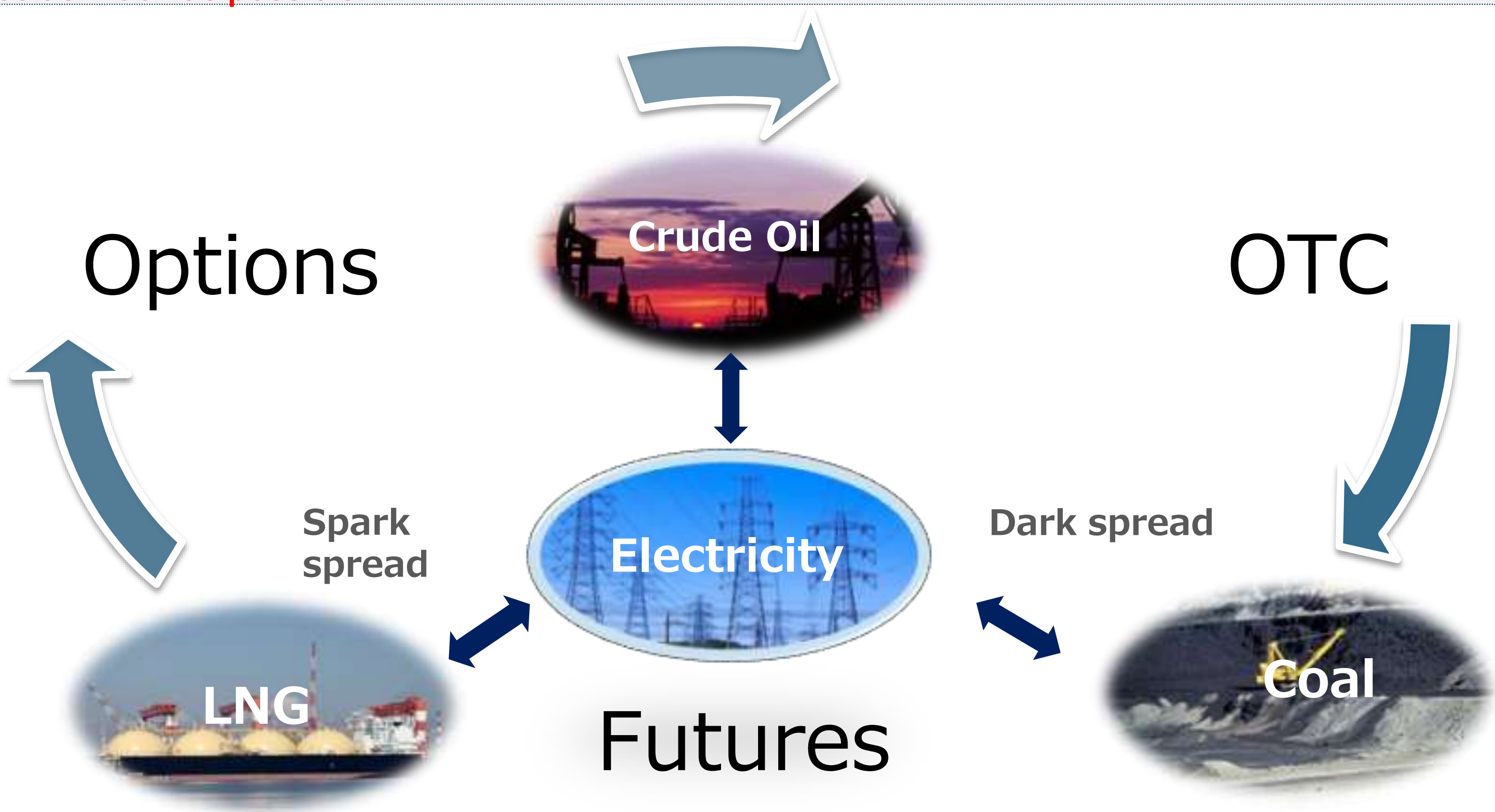
- TOCOM continues discussions with industry participants in advance of a listing for LNG and coal and will start preparations to launch these futures contracts.

- Preparations are proceeding on the assumption that the electricity futures contracts will trade on "J-GATE", TOCOM's existing derivatives trading platform.

Growth Strategy 2017 < Cabinet Office >

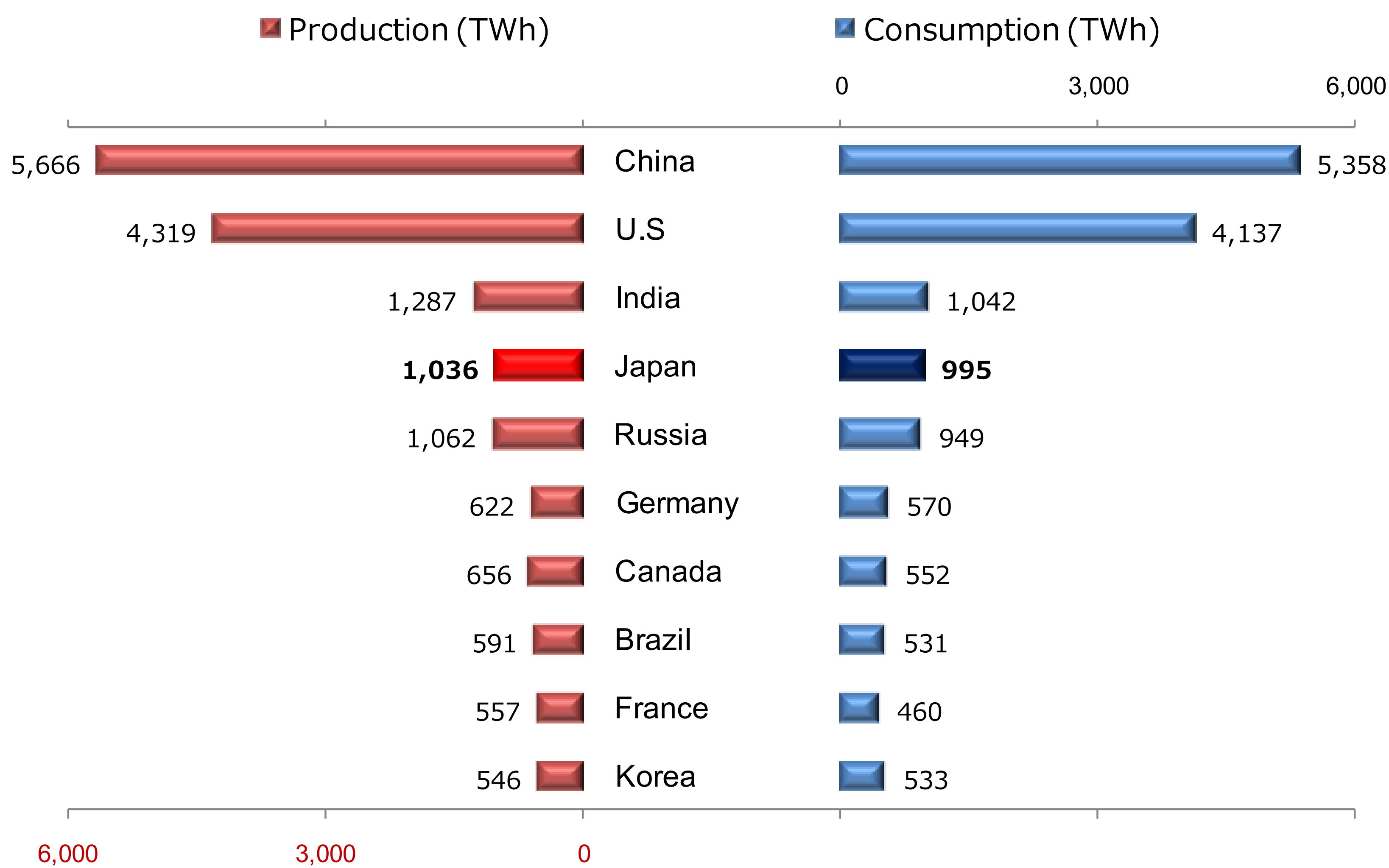
iii) Establishment of new energy systems

・ The government aims for the realization of 3E+S while effectively utilizing the market mechanism to stimulate the competition in the electric power market.
The government will also study power futures trading taking into consideration of the development of an environment where power futures trading is made together with LNG and other energy futures trading as a one stop service as much as possible.



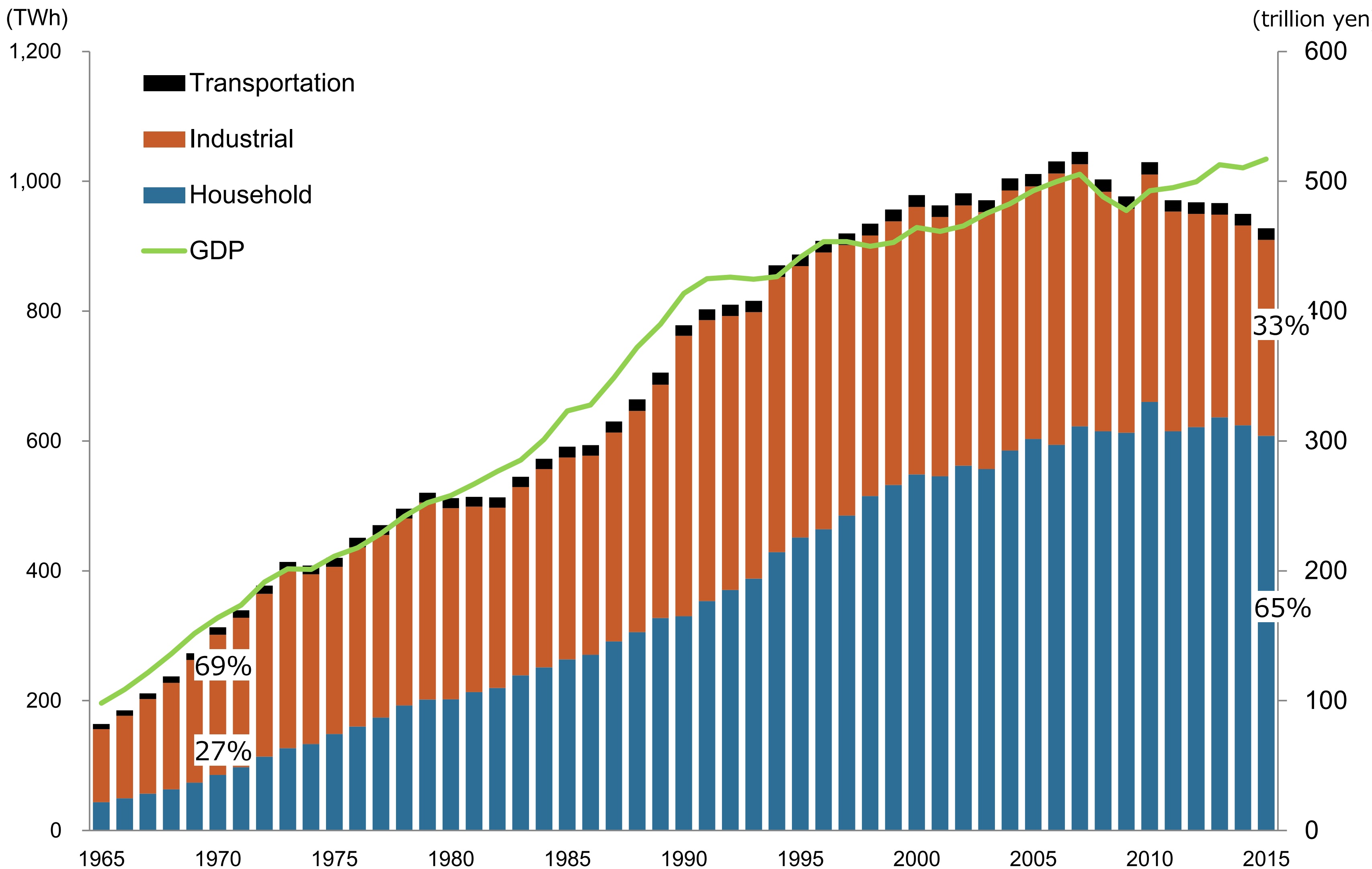
Japan’s Electricity Market outline

Electricity Consumption & Production by country



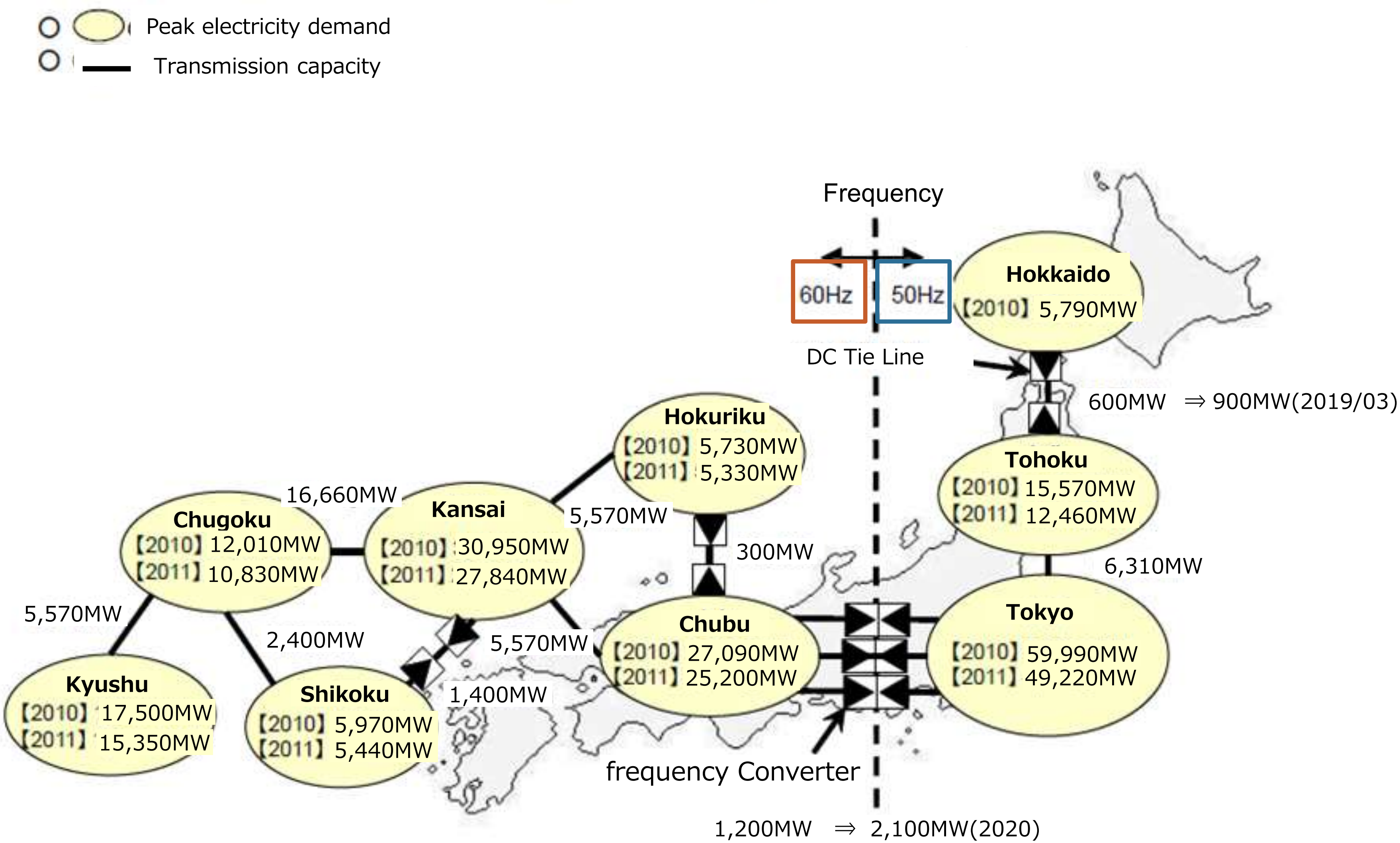
Source: Key World Energy Statistics 2016, IEA

Power Demand in Japan



Source: METI

Peak demand and Transmission capacity



Source: METI

Liberalization of electricity market in Japan

Electricity Market Reform

1995
- Open the IPP (Independent Power Producer) market
- Introduction of Fuel Cost Adjustment System

2000
- Liberalize electricity retail supply for extra-high voltage users
- Introduces simultaneous/ commensurate regulated power supply system

2003
- Establish the wholesale power exchange (JEPX)

2004, 2005
- Liberalize electricity retail supply for high voltage users

2008
- Establish the hour ahead market at JEPX

2011
- Great East Japan Earthquake

2015
- Establish the Organization for Cross regional Coordination of Transmission Operators (OCCTO)
- Establish the Electricity Market Surveillance Commission (EMSC)

2016
- Liberalize electricity retail supply for low voltage users **"Full Liberalization"**

Transitional Period of Regulated Retail Tariffs

2020
- Legal unbundling of transmission /distribution sector
- Abolishment of Regulated Retail Tariffs ?

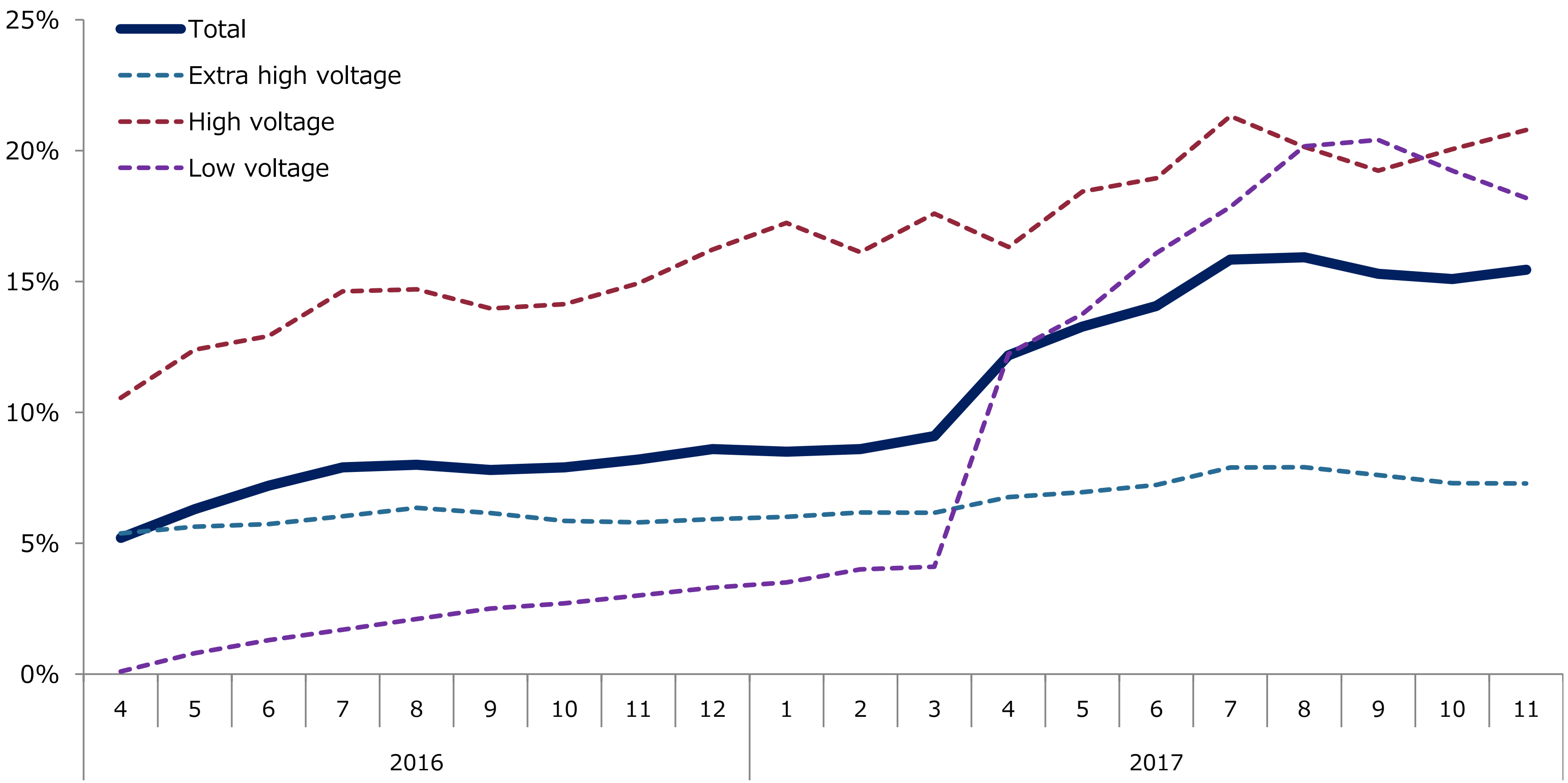
【Electricity Market Reform Kantetsu Committee】

① Baseload power market (FY 2019)
② Capacity market (FY 2020)
③ New Transmission Interconnection Rules including implicit auction (FY 2018)
④ Non-fossil value trading market(FY 2019)
⑤ Gross bidding (FY2017)
⑥ Real – time market(FY2020)

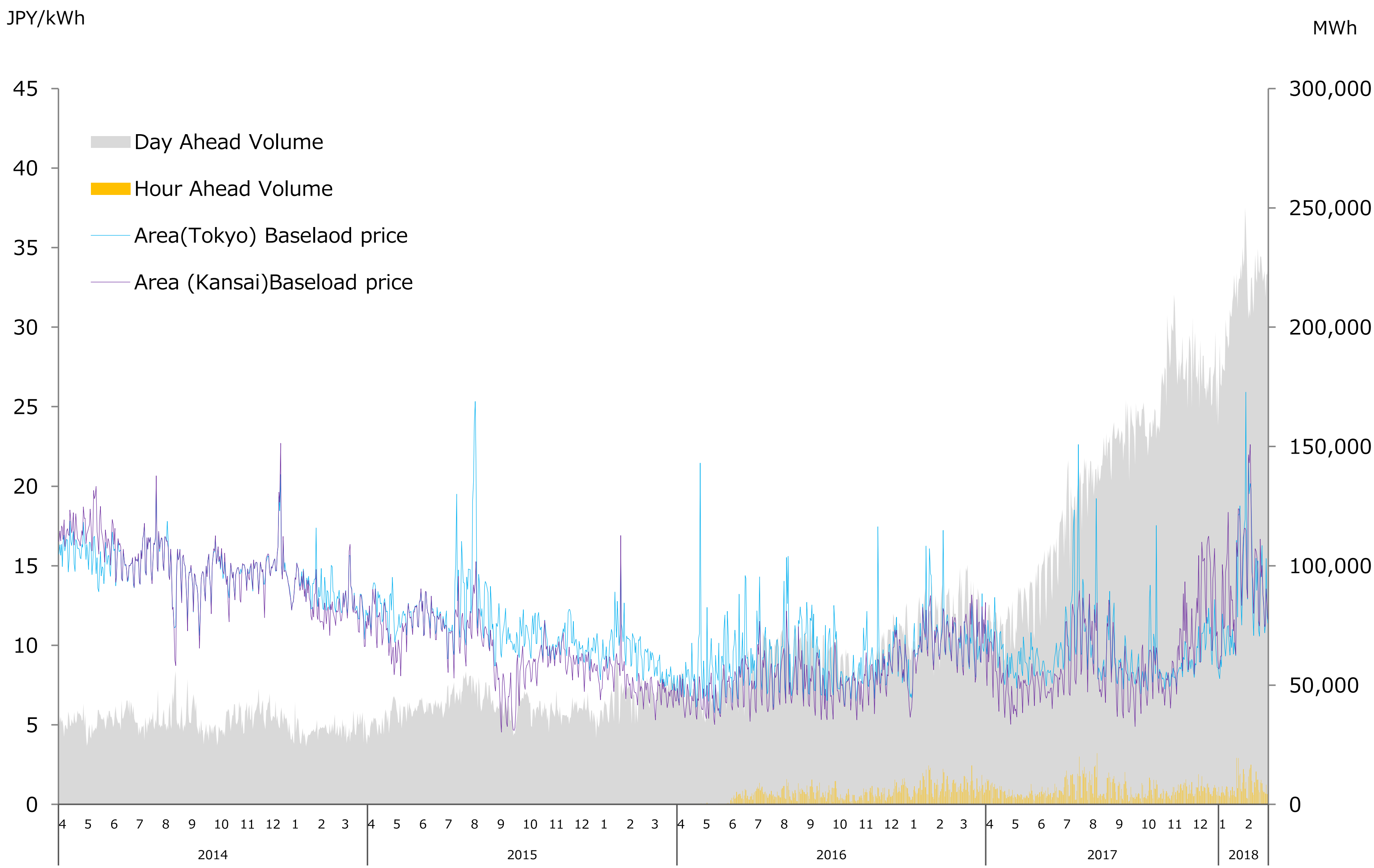
New entry to the liberalized electricity market

Nearly 450 entrants from a variety of sectors registered as retailers .

Market share of New Entrants

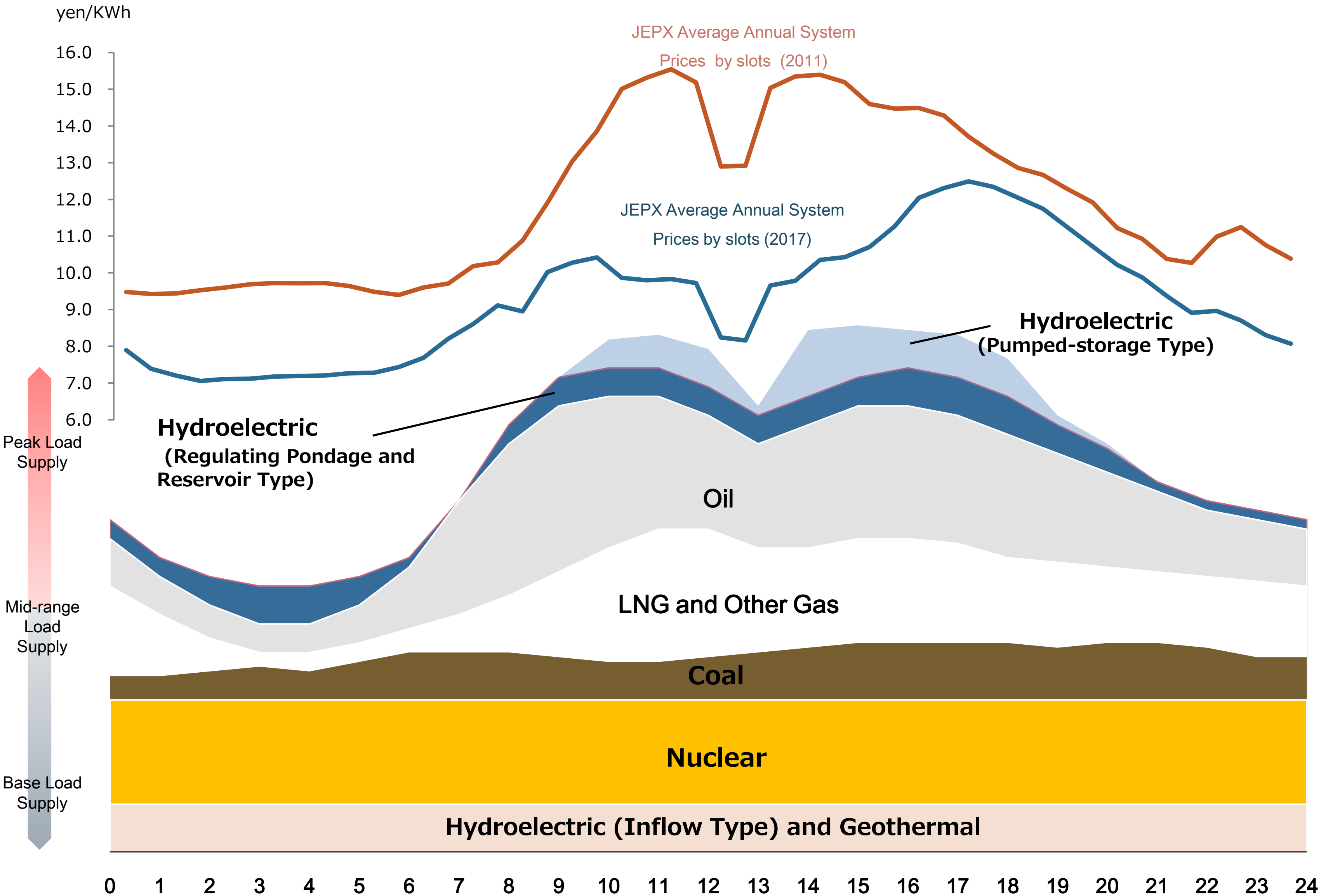


JEPX Spot Market price & Trading Volume



Source: JEPX

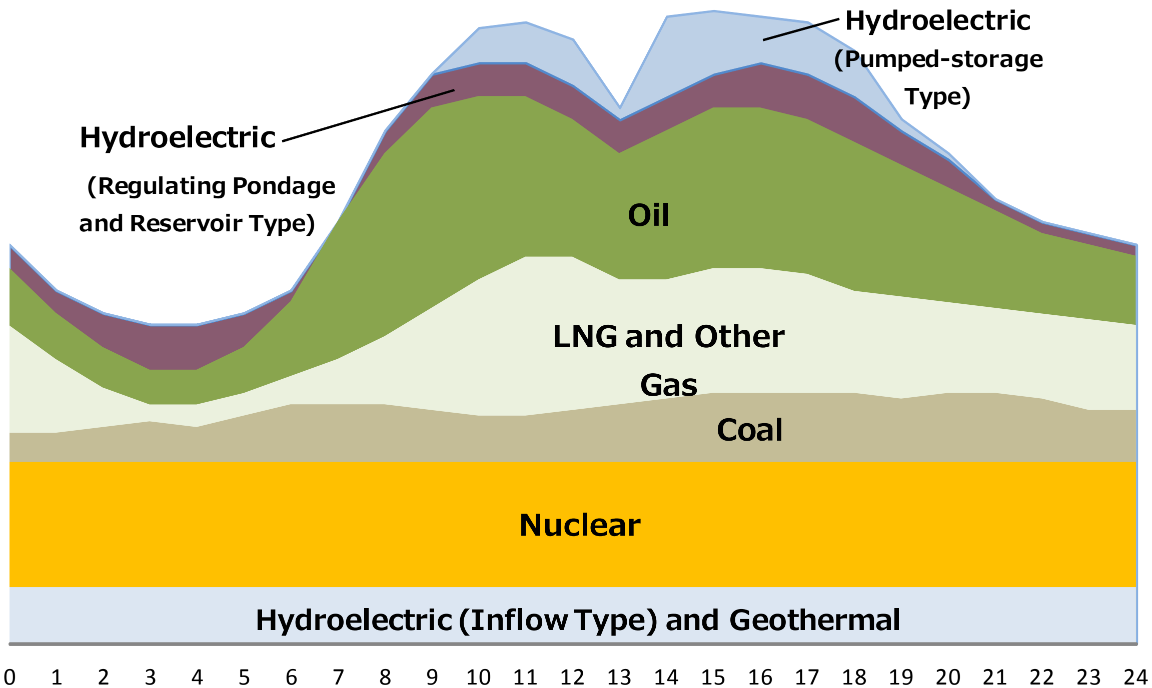
Combination of Power Sources and JEPX intra-day price

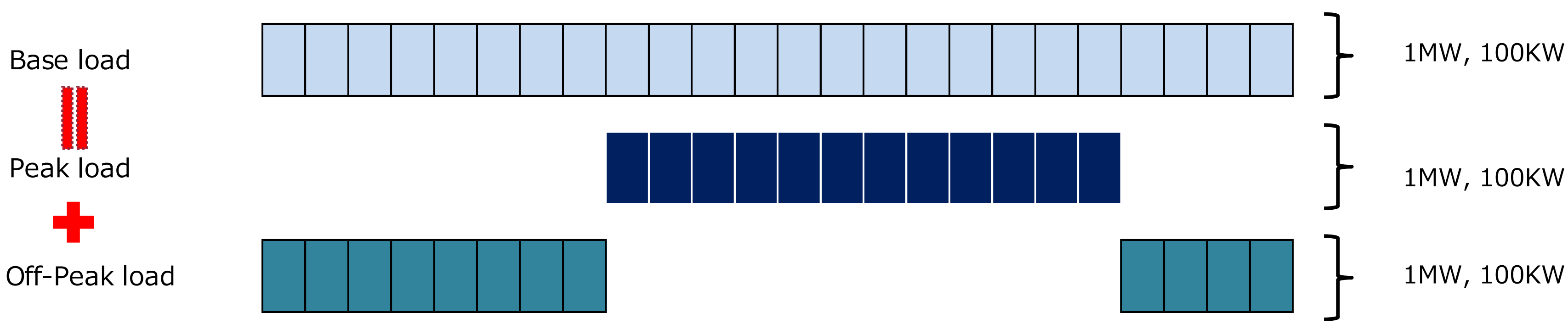


Source: JEPX
The Federation of Electric Power Companies of Japan

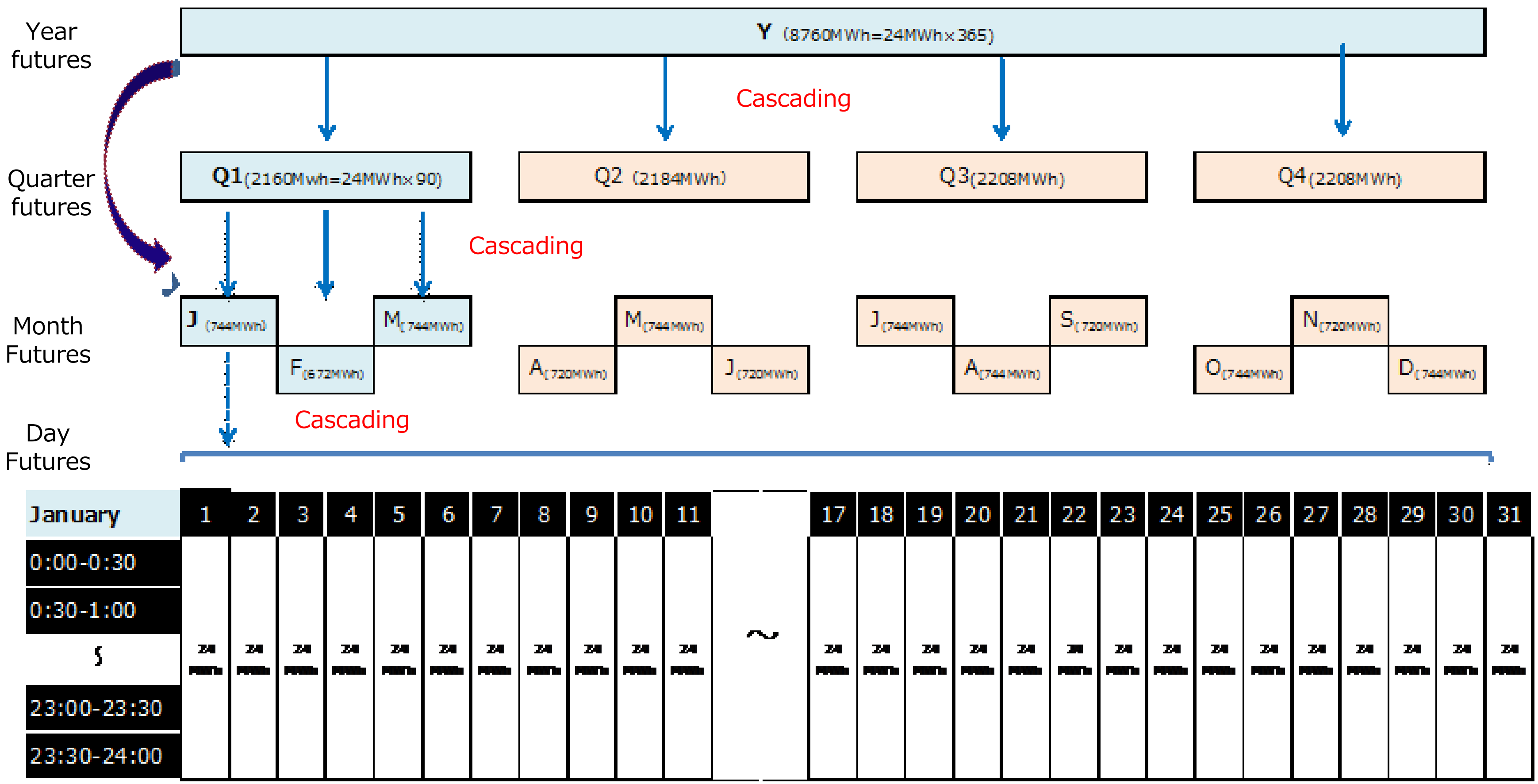
Framework for electricity futures contract
and
Global Electricity Futures Market

Key concepts for electricity futures contract design (1)





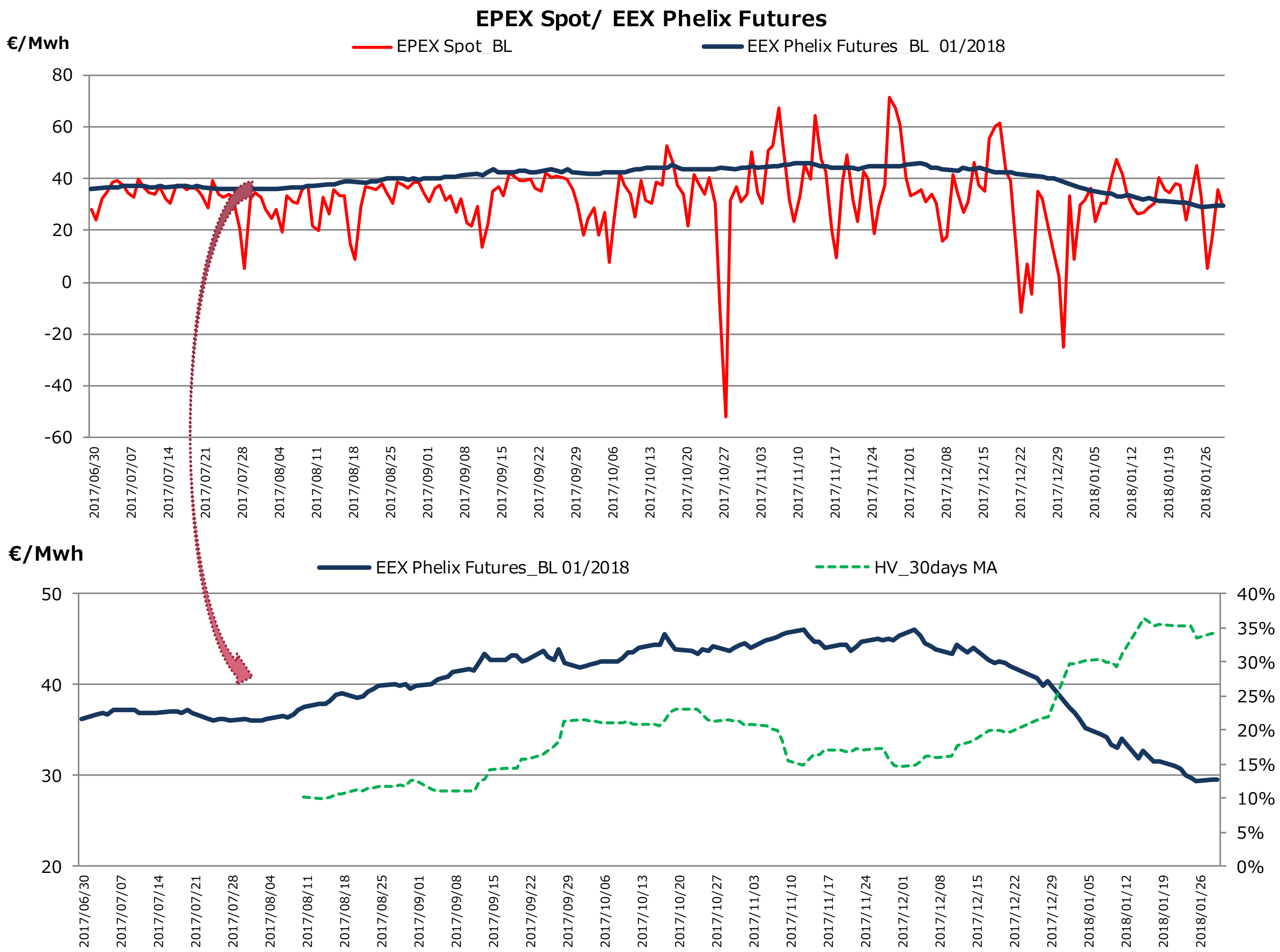
Key concepts for electricity futures contract design (2)



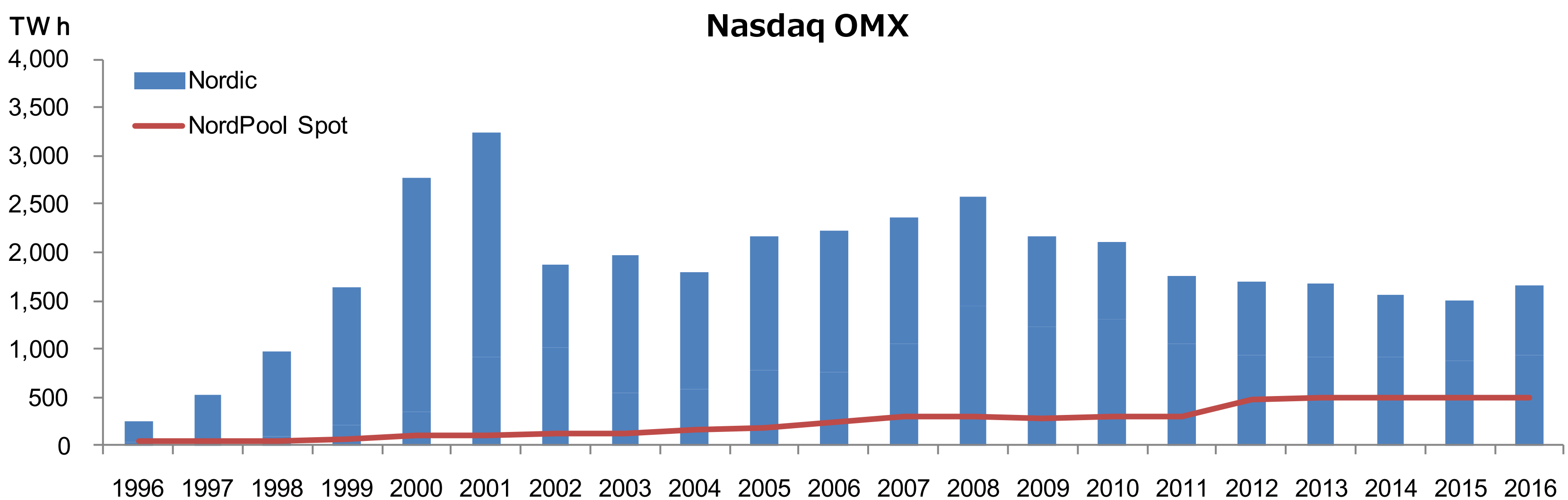
Examples of Electricity futures Contracts

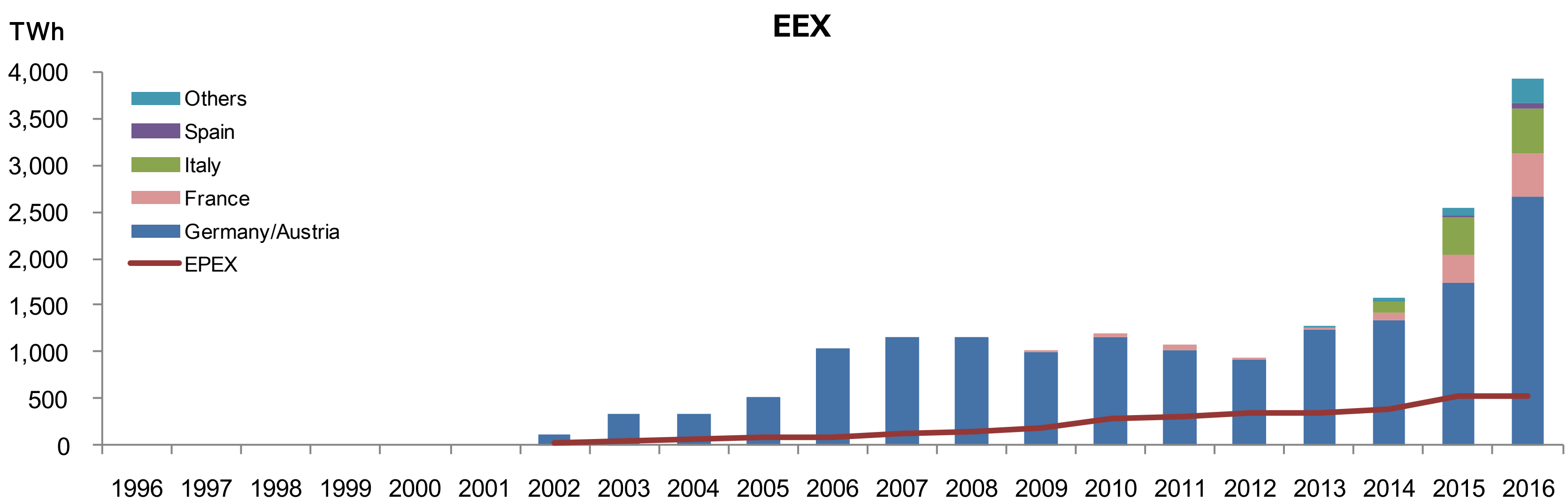
	Nasdaq OMX	EEX	CME
	Nordic DS	Phelix DE/AT	PJM Western Hub Day-ahead
Contract base size	1Mwh	1Mwh	5Mwh
Base load	○ (0:00 – 24:00)	○ (0:00-24:00)	×
Peak load	×	○ (08:00-20:00 for all days Monday through Friday)	○ ("Peak day" shall mean a Monday through Friday, excluding North American Electric Reliability Corporation holidays. From Hour Ending (HE) 0800 Eastern Prevailing Time (EPT) through HE 2300 EPT)
Off-Peak load	×	○ (0000-0800 and 2000-2400 for all days Monday through Friday)	○ (Off-Peak shall mean Monday through Friday Hour Ending (HE) 0100-0700 and 2400 Eastern Prevailing Time (EPT) Saturday-Sunday HE 0100-2400 EPT including North American Electric Reliability Corporation holidays.)
Year futures	○ (10 years)	○ (6 years)	×
Quarter futures	○ (2 years) Cascading	○ (11 quarters) Cascading	×
Month futures	○ (6 months)	○ (10 months)	○ (60 months)
Week futures	×	○ (5 weeks)	× Cascading
Weekend		○ (5 weeks)	×
Day futures	×	○ (34 days)	○ (2 months)
Settlement method	Cash settlement	Cash settlement	Cash settlement

Electricity Spot price vs Electricity Futures price



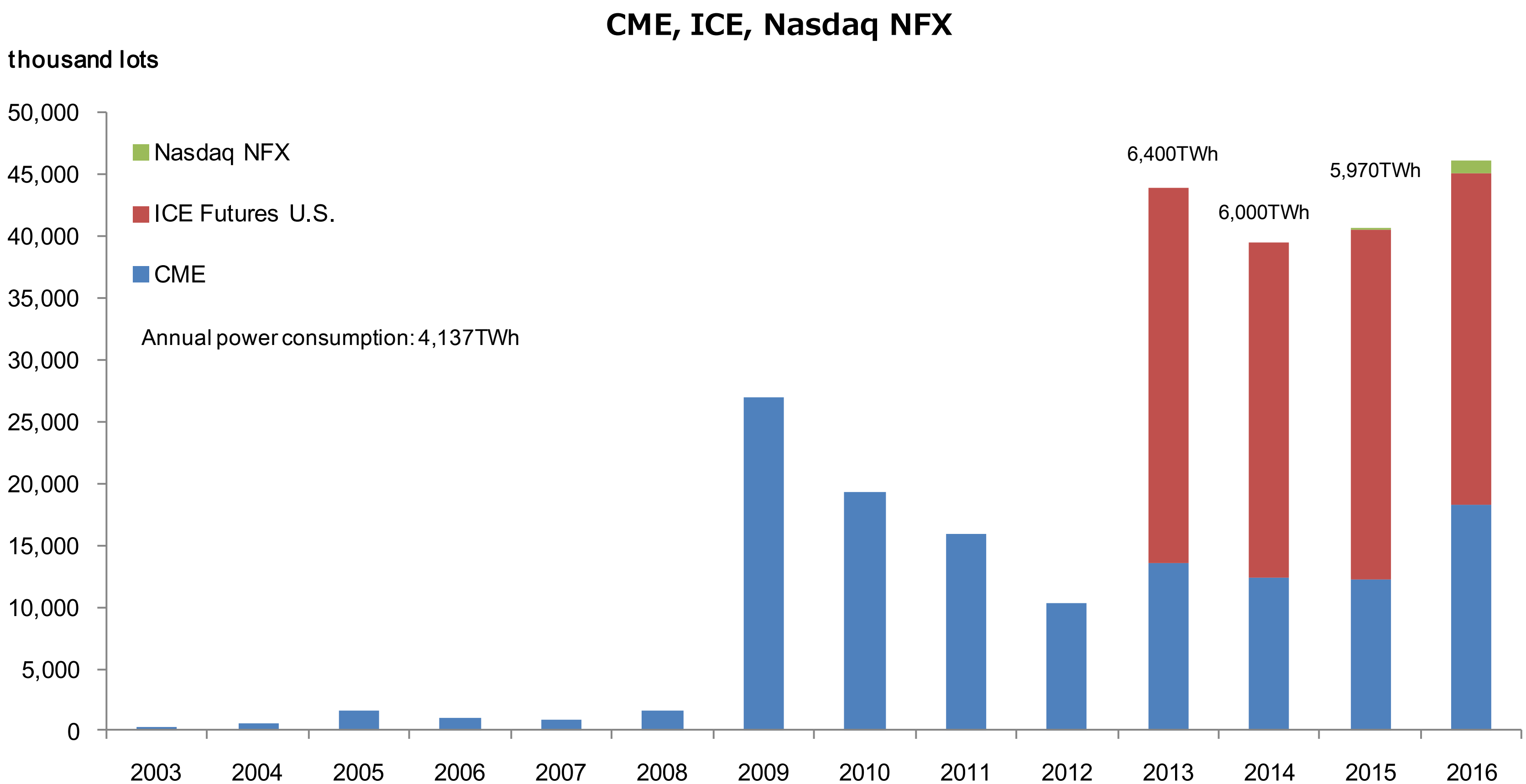
Electricity futures market size : Europe





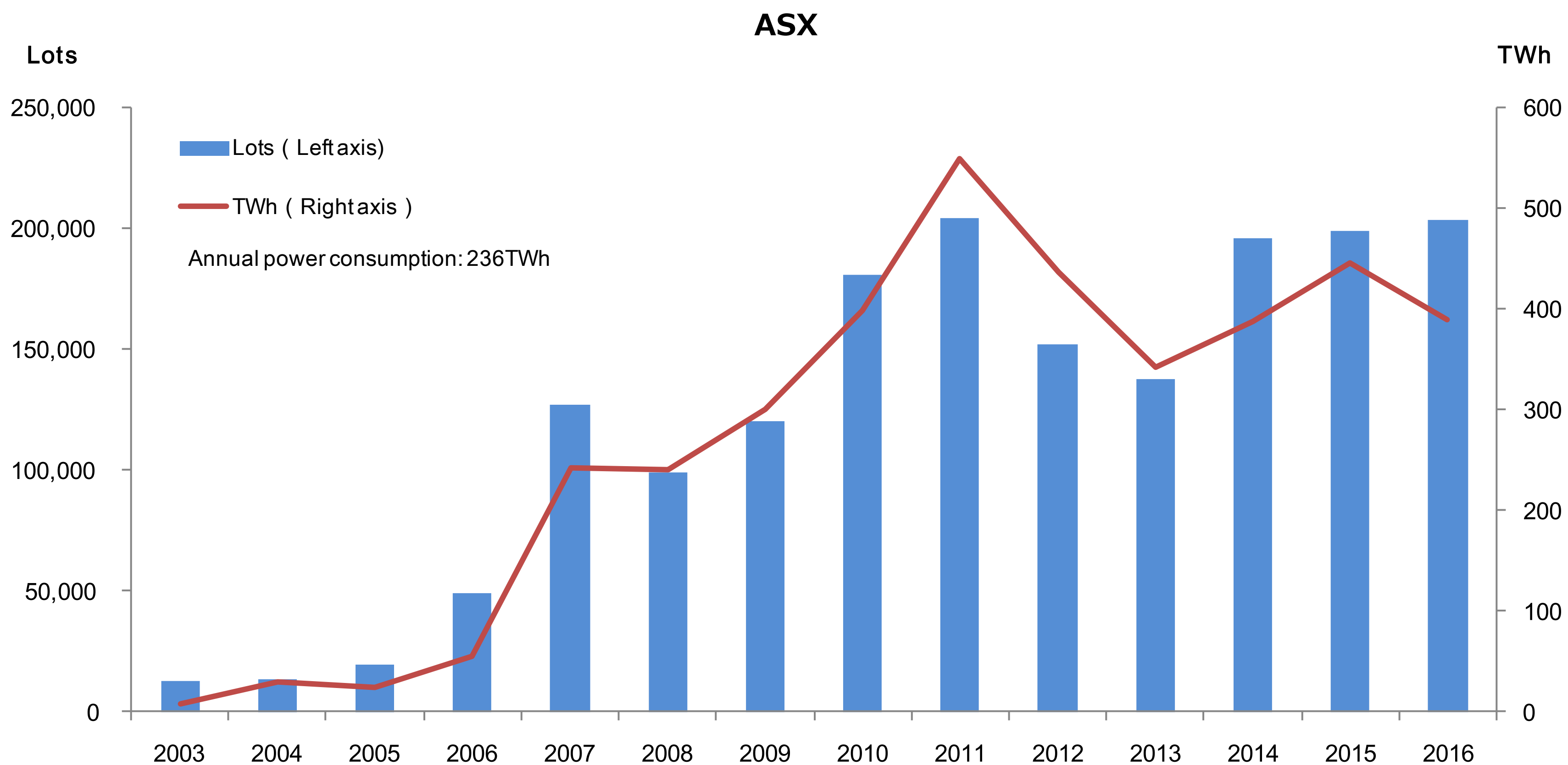
Source: Nadaq OMX
EEX

Electricity futures market size : U.S.



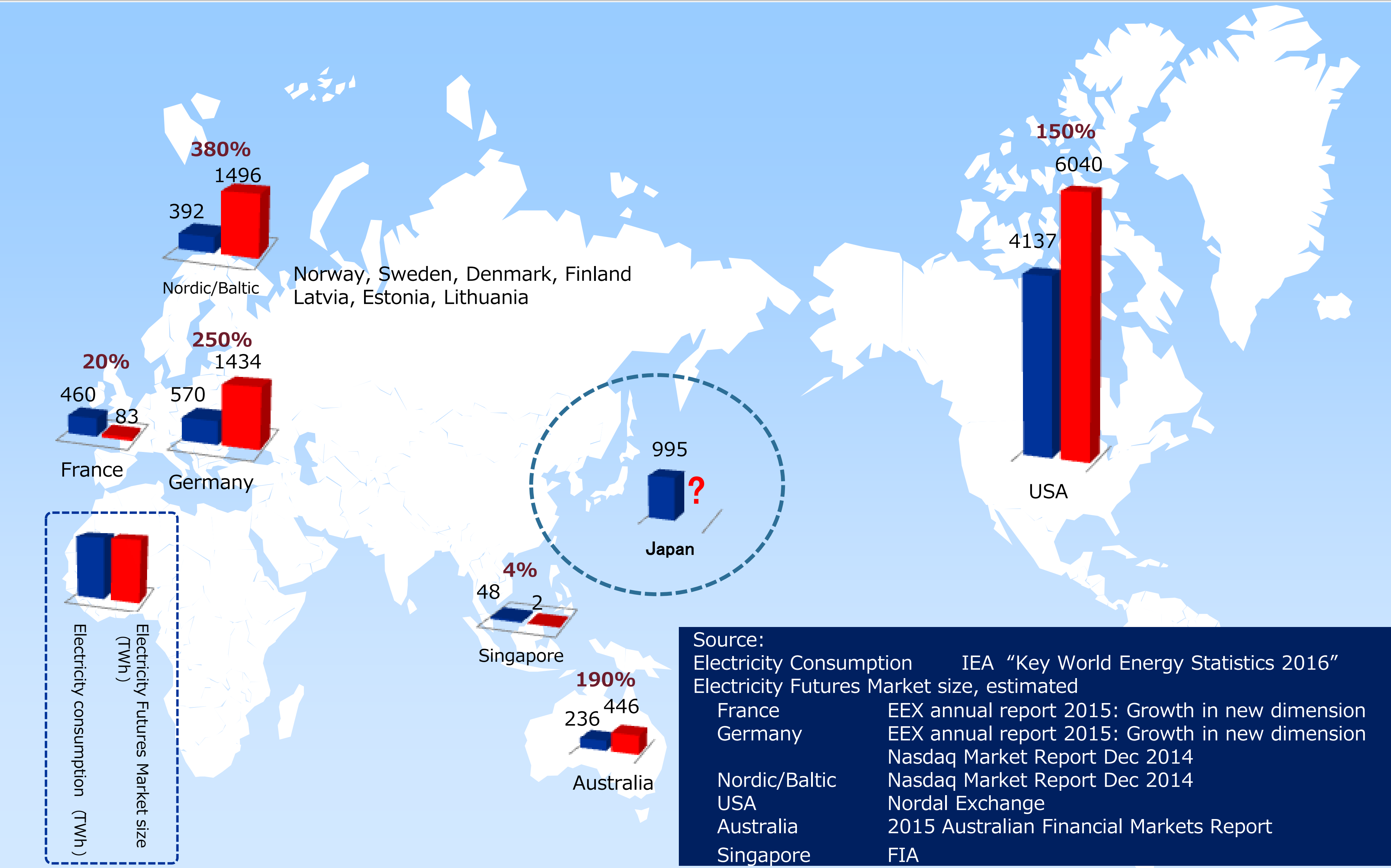
Source: FIA
Nodal Exchange

Electricity futures market size : Australia



Source: FIA

Electricity Consumption & Futures Market size in major countries



Source:

Electricity Consumption IEA "Key World Energy Statistics 2016"

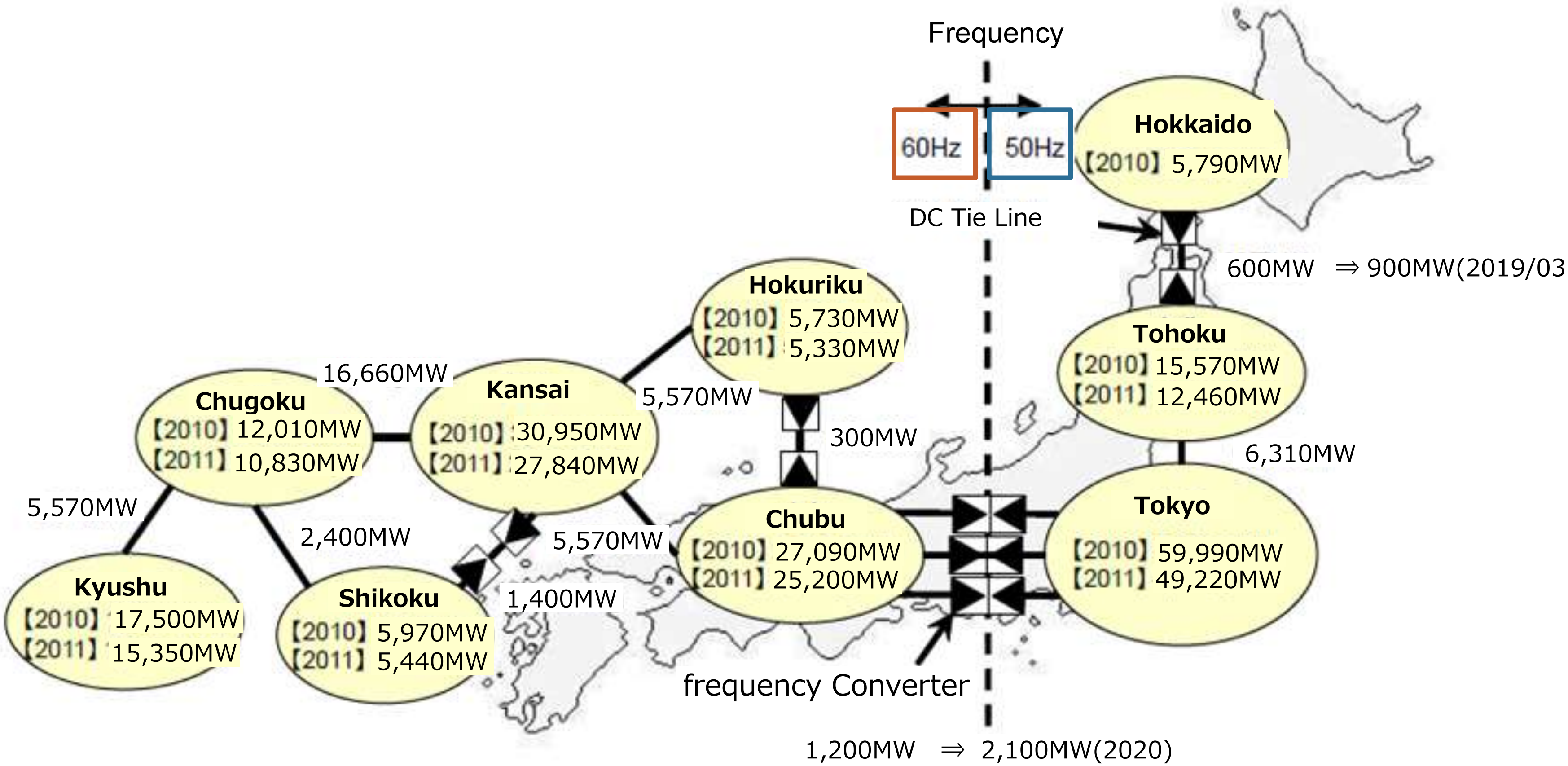
Electricity Futures Market size, estimated

France	EEX annual report 2015: Growth in new dimension
Germany	EEX annual report 2015: Growth in new dimension Nasdaq Market Report Dec 2014
Nordic/Baltic	Nasdaq Market Report Dec 2014
USA	Nordal Exchange
Australia	2015 Australian Financial Markets Report
Singapore	FIA

Product design for
TOCOM Electricity Futures Contract

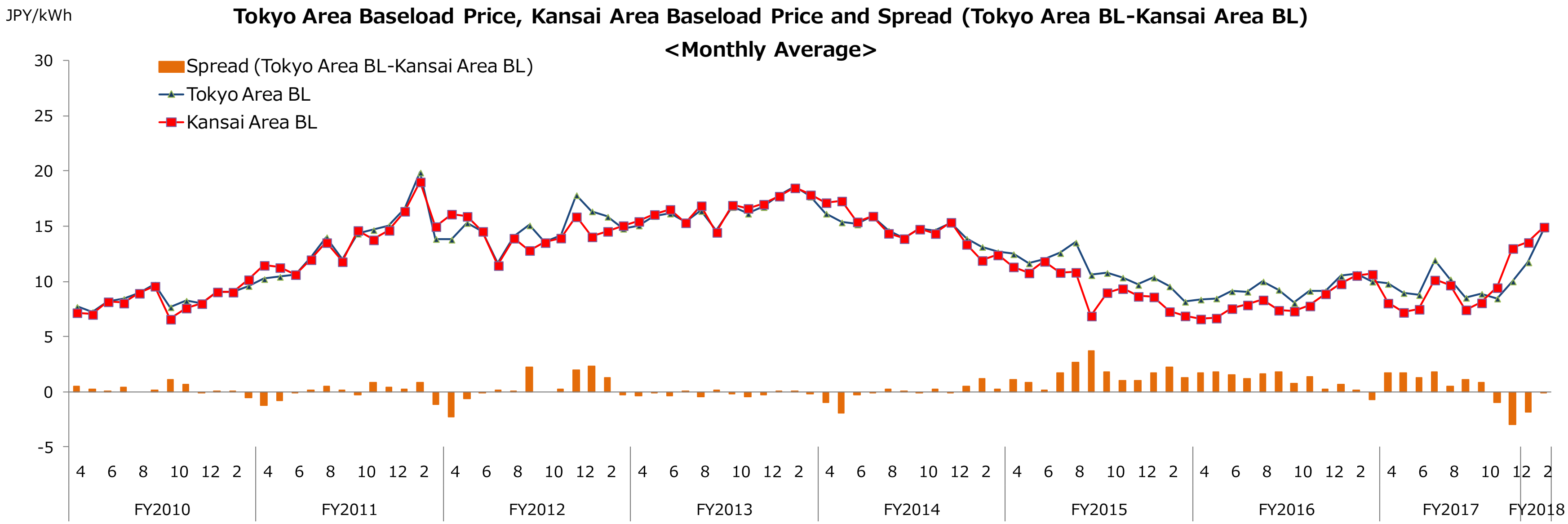
Peak demand and Transmission capacity

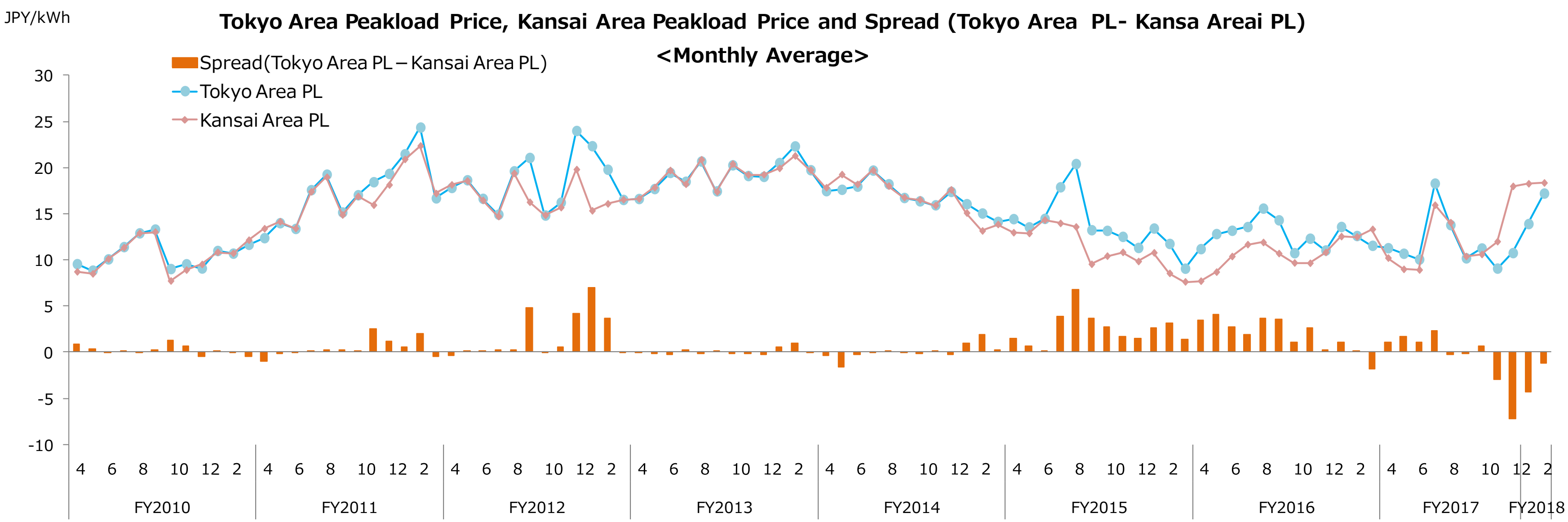
○ Peak electricity demand
○ Transmission capacity



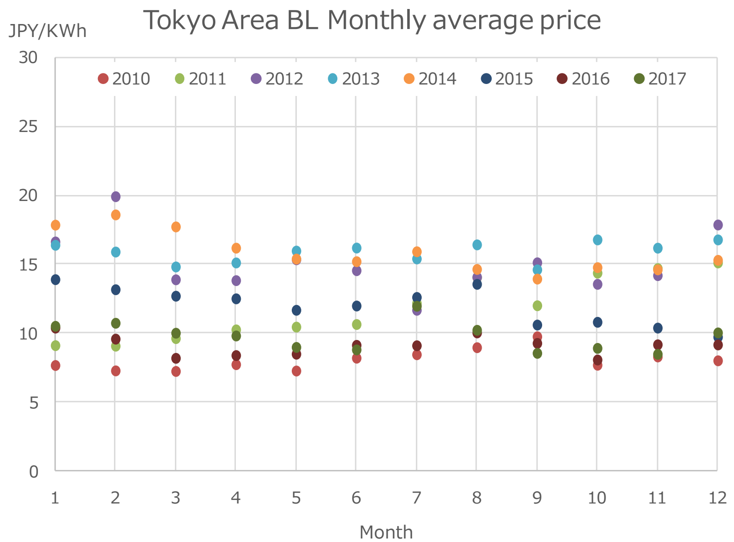
Source: METI

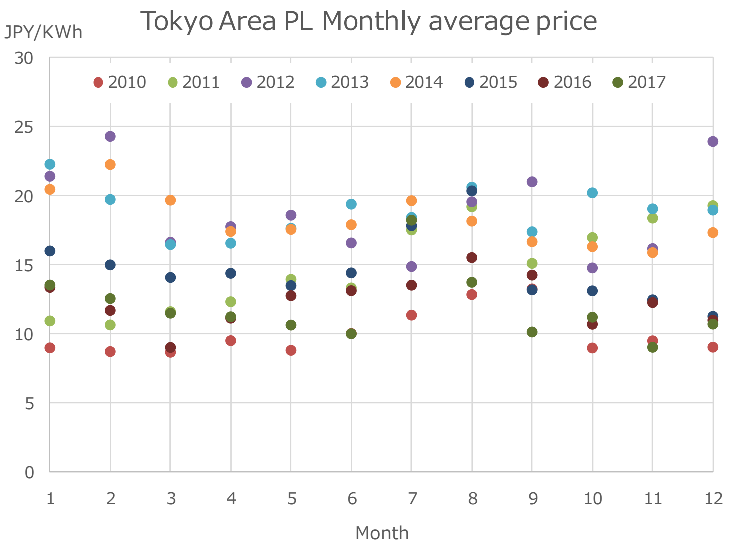
Monthly average Baseload /Peakload price by area

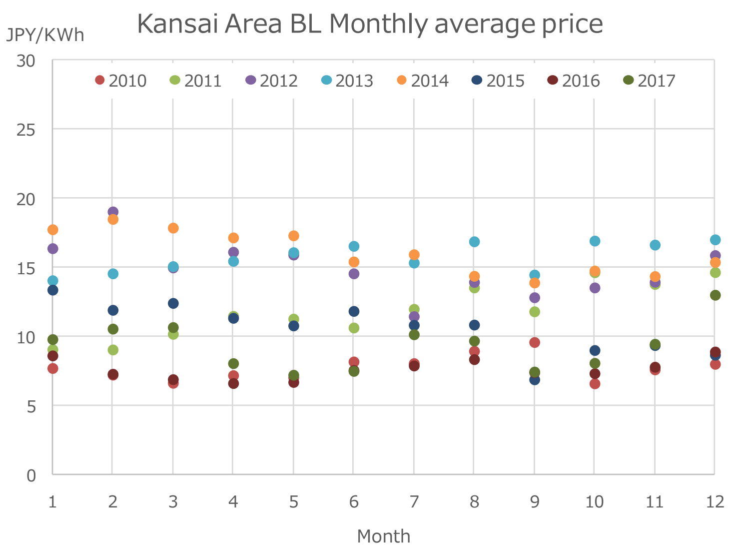


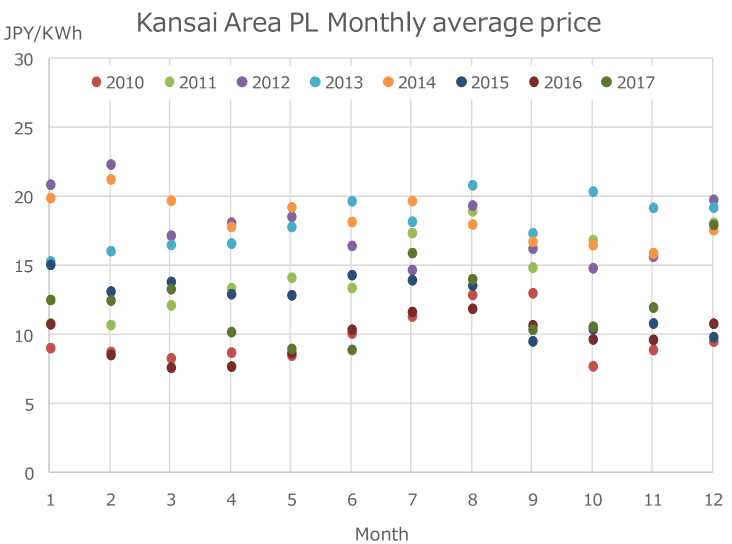


Monthly average Baseload / Peakload price by area ③









Listed Contracts and Contract Specifications

- The contract specifications and other details for electricity futures will be finalized based on industry feedback and the consultation with the regulators.

- Futures contracts that may be listed are as follows;

① West Area Baseload
② West Area Peakload
③ East Area Baseload
④ East Area Peakload

Potential market participants

1. Domestic power companies

    ① Incumbent power companies

    ② Power Producer and Suppliers（PPS）

    ③ Trading Firms

2. Overseas Participants

    ① European power trading companies

    ② U.S power trading companies and retail companies

    ③ Australian and New Zealand power trading companies