

Japan's market reform

Developing new market mechanisms

June 15, 2018

Manabu NABESHIMA

Director for Electricity Supply Policy
Agency for Natural Resources and Energy

Tight Supply and Demand Balance in The Last Winter

- From the late January to early February, the reserve margin of the TEPCO area declined due to the occurrence of factors such as high demand.
- TEPCO activated Demand Response (DR), and OCCTO instructed emergency allocation of electricity. As a result of this response, a reserve margin of 3%, which is the minimum level required for stable supply in Japan, was secured.

Main factors (January 22 - February 2)

High Demand

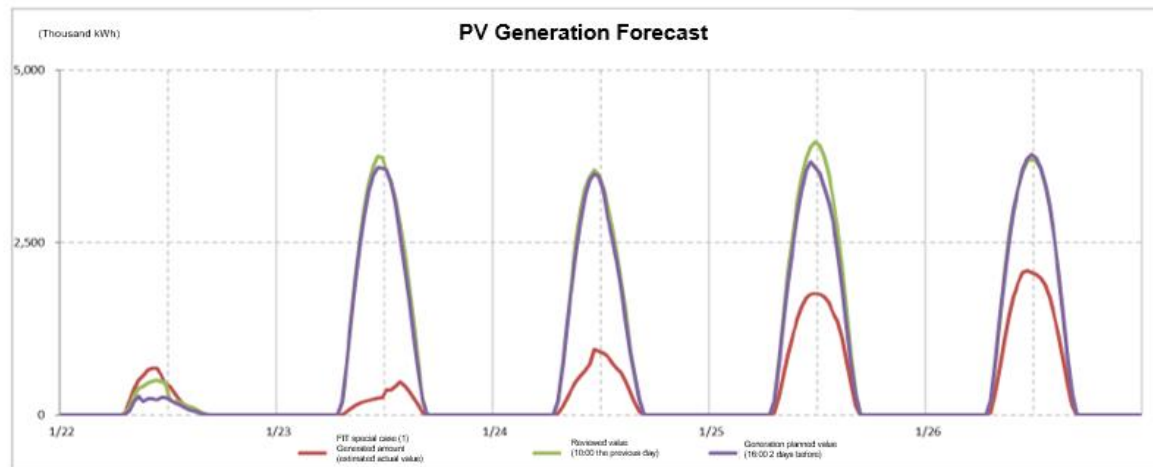
107% of the H1 (once-in-a-decade) demand forecast (Tokyo area: 52.7 GW)

Unplanned Shut down of Thermal Power Plants

2.7GW reduction due to shut down of thermal power plants

Forecast error in PV Power Generation

Error in the forecast of PV power generation due to snow accumulated on PV panels (Max. approx. 37 GWh / day)



Emergency Allocation of Electricity instructed by OCCTO

Total 6 days (Jan 23-26, Feb 1-2)
1.0 GW to 2.6GW
7 areas → Tokyo area

Activation of Demand Response

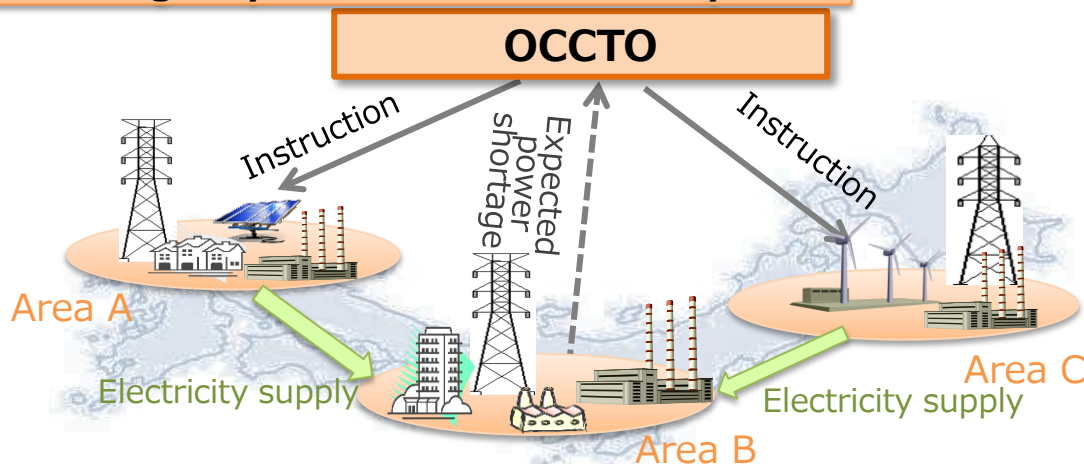
Total 7 days (Jan 22-26, Feb 1-2)
Approx. 500 MW

3% reserve margin was secured

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

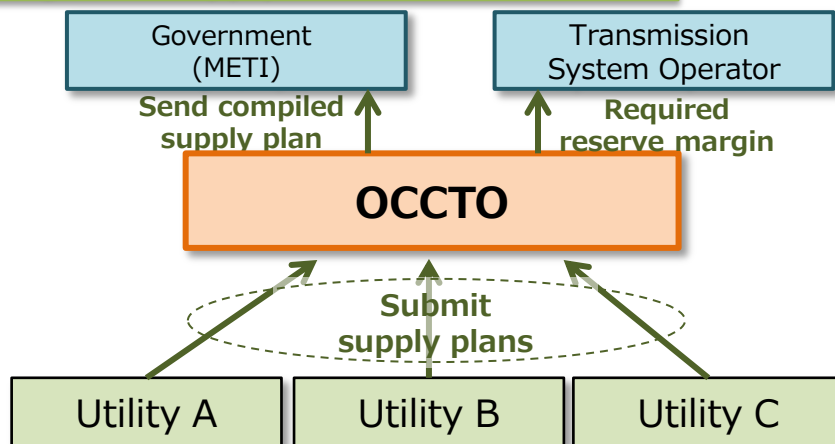
- The Organization for Cross-regional Coordination of Transmission Operators, Japan (OCCTO) was established in April 2015 to coordinate cross regional operation of the transmission and distribution network.

Emergency allocation of electricity



- ◆ OCCTO organizes utilities to deliver and receive electricity at times of low reserve margin. (Emergency Allocation of Electricity)

Medium and Long-term supply and demand forecast

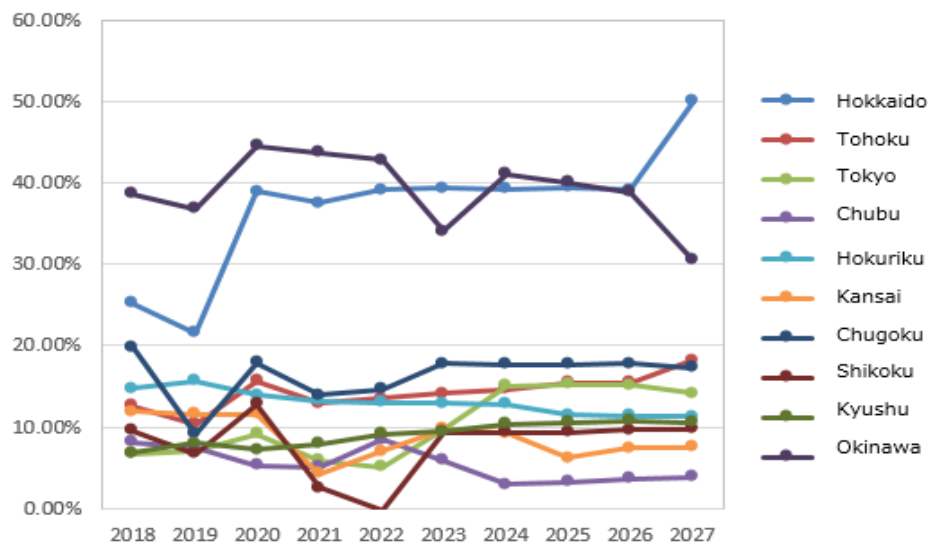


- ◆ OCCTO compiles utility's supply plans and provides forecast of long-term supply and demand.
- ◆ OCCTO establishes guideline of required reserve margin for Transmission System Operator (TSO).

Medium and Long-term Reserve Margin

- In the early 2020s, the reserve margin in several control areas are predicted to fall below 8% which is required for medium- and long-term supply.

**Medium- to long-term reserve margin
forecast by area (17:00 daily in August, net transmitted electricity)**



**Possibility of electricity trade between control areas
is not reflected in the above estimation.**

Source: Created from the "Summary of Supply Plans for FY 2018" by OCCTO

Supply Plans for 2021

	Incumbent Utility (Retail Division)	New Entrants	Total value
Demand	123.5 GW	34.4 GW	157.9 GW
Supply capability	143.2 GW	15.1 GW	158.3 GW
Supply capability versus demand	115.9 %	43.9 %	100.2 %

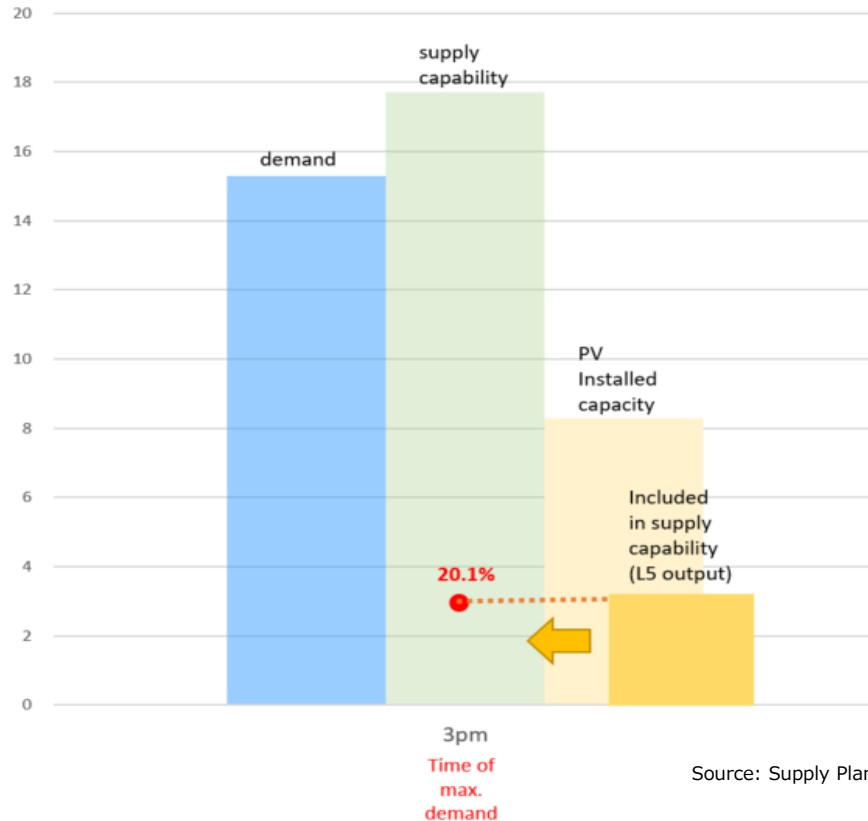
Source: Created from the "Summary of Supply Plans for Fiscal 2018" by OCCTO

Effect of Introduction of Renewables

- The output from PV generation is estimated to reach more than 20% of supply capability during the peak demand time in August.
- PV generation has reached approx. 80% of supply in some control areas (in particular situation.)
- Utilization of balancing capacity (pumped-hydro, thermal generation, demand response) as well as interconnection lines is necessary to balance the supply and demand.

Supply and demand forecast for August 2018 (Kyushu Area)

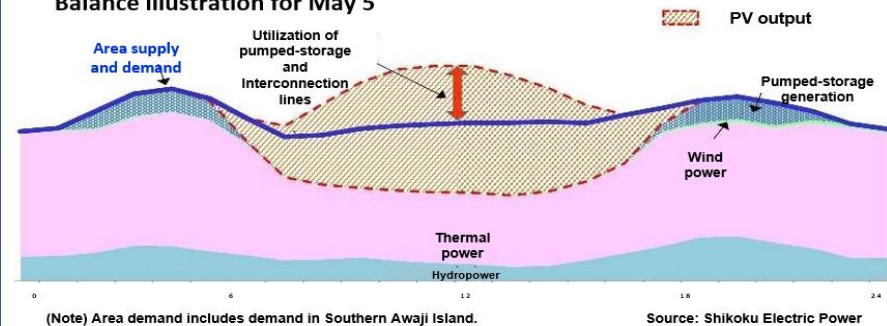
Supply and demand
[Units: GW]



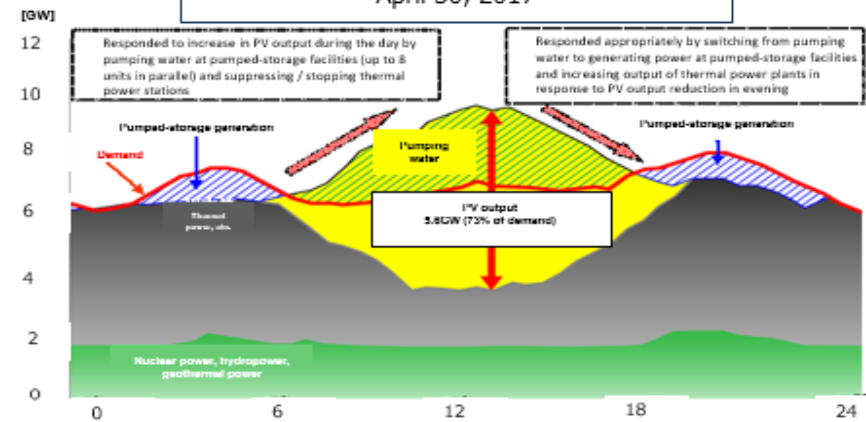
Source: Supply Plan (2018FY)

Supply and demand balance illustration for Shikoku Electric Power on May 5, 2018

Balance illustration for May 5

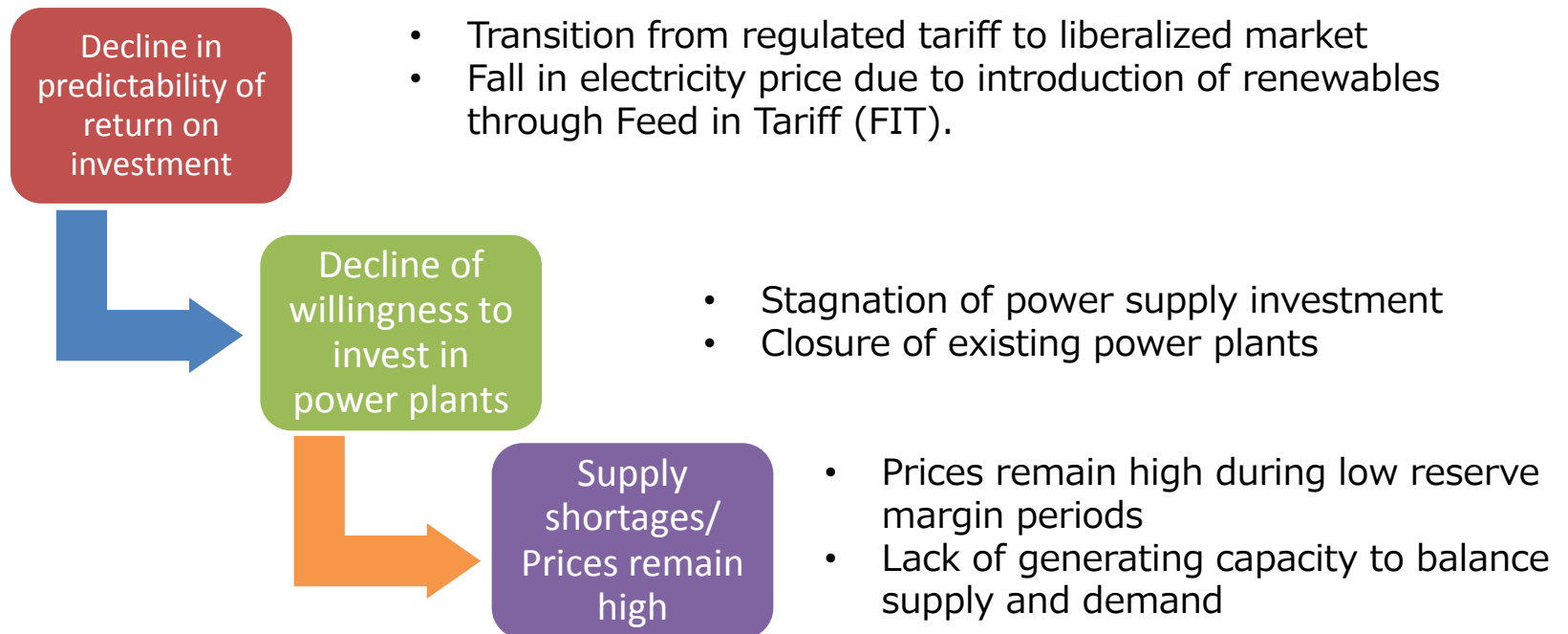


Supply and demand record for Kyushu on April 30, 2017



Background of “Kantetsu” (carry out) Package

	January 2011 (Pre-earthquake)	January 2016 (Pre-total liberalization)	January 2018
New entrants share	3.73%	8.87%	12.4%
JEPX share	0.6%	1.77%	7.7%
Renewables share (Excluding hydro)	2.1% (FY 2010)	7.0% (FY 2016)	



New Wholesale Electricity Market (“Kantetsu” (carry out) Package)

1. Promoting Competition

(1) Baseload Market

(2) Implicit Auctions/Financial Transmission Rights

2. Addressing Public Interest Issues

(1) Capacity Market

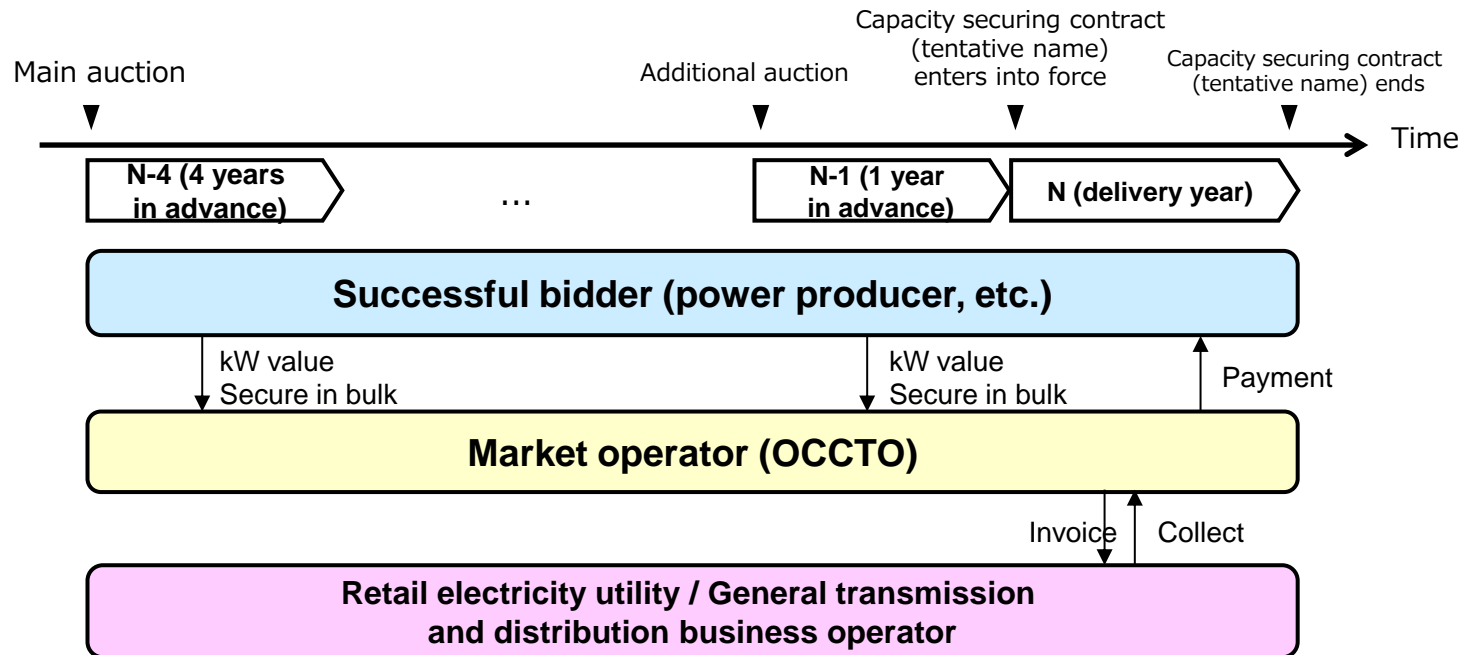
(2) Balancing Market

(3) Non-fossil Value Trading Market

Capacity Market

- A capacity market is going to be introduced in 2020 with the aim of ensuring sufficient capacity in the medium term
- In the capacity market, the main auction is held four years in advance. In addition, an additional auction is held one year in advance to adjust for any excess or deficiency.

Capacity market transaction (illustration)

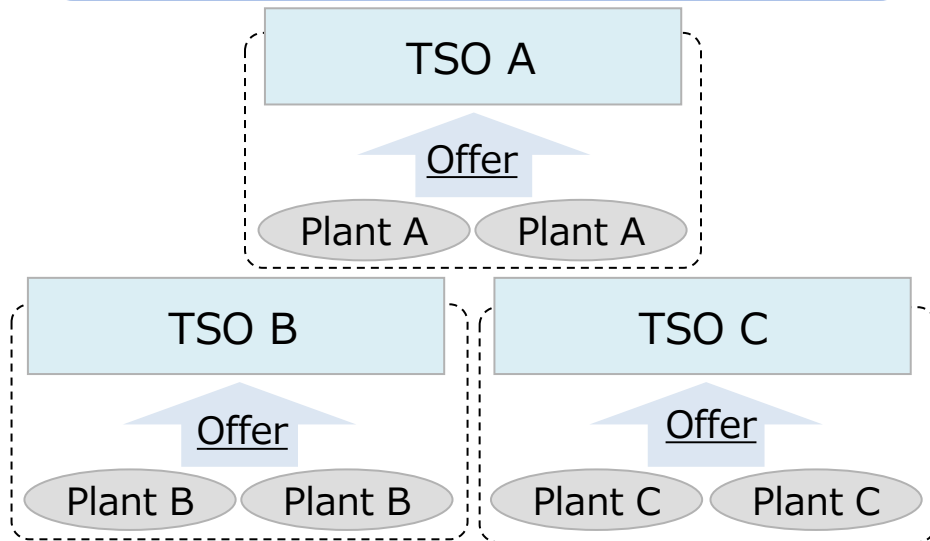


Balancing Market

- A balancing market enables TSOs to procure and operate balancing capacity from the cross-regional market.
- A balancing market will be established around 2020.

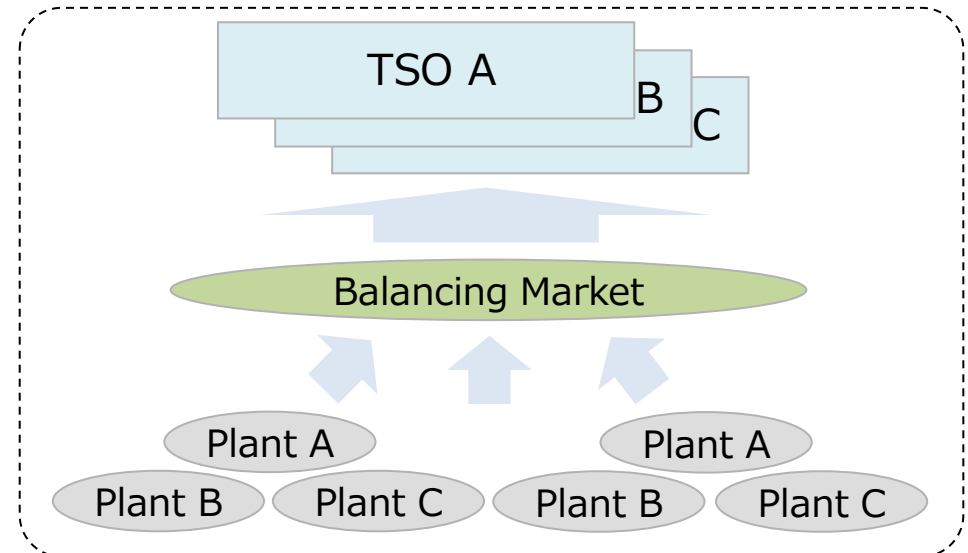
Current

TSOs procure balancing capacity located in their control area



After 2020

TSOs will procure balancing capacity from the cross-regional market



Market Introduction Schedule

