

# Approaches for Introducing Competition in the Energy Markets: The Experience of Japan

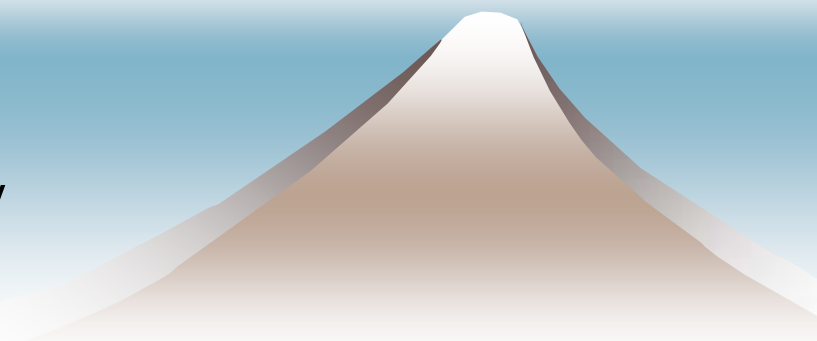
October 6, 2003

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# 1. Overview (1): conditions and needs

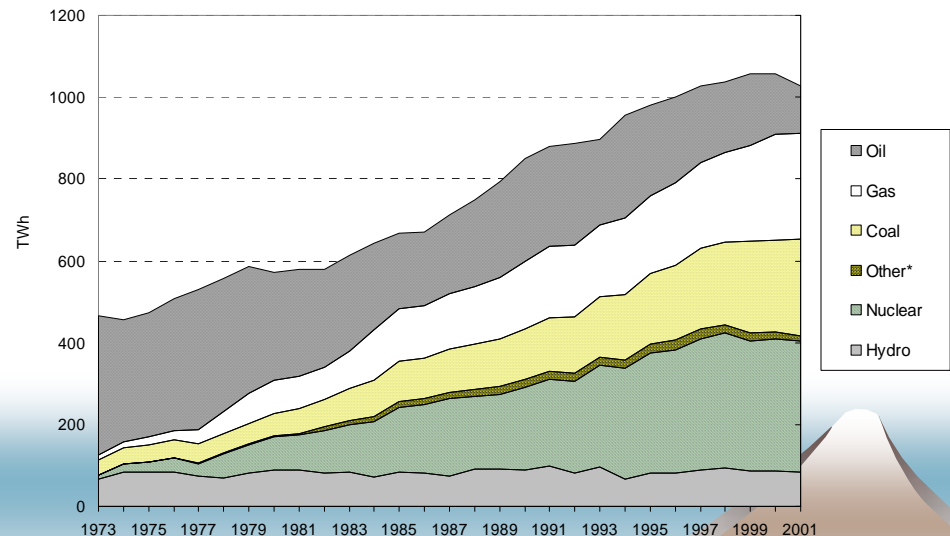
Inherent conditions: isolated and mountainous archipelago with scarce indigenous energy sources

4% energy self-sufficiency rate excl. nuclear

20% energy self-sufficiency rate incl. nuclear

Policy needs: diversification of fuel mix

- Generation Capacity 262GW
- Power Generation 1,140TWh
- Fuel Mix: Nuclear 31% Gas 27% Coal 22% Oil 10% Hydro 9%

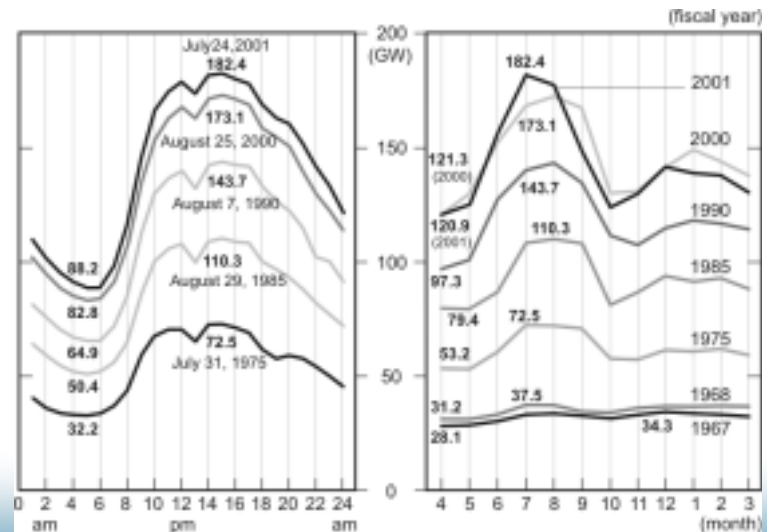
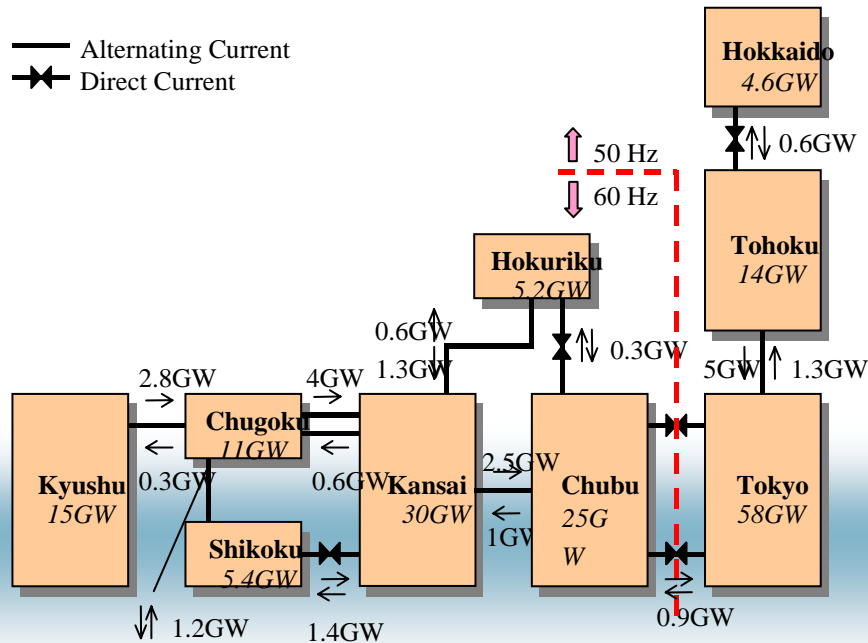


# 1. Overview (2): market situation

10 General Power Utilities (GPUs), vertical-integrated with generation, transmission and distribution segments, with their franchised areas under public service obligation.

Eastern GPUs in 50Hz region and Western 60Hz. Interconnection capacities between them and even among most GPUs' areas are weak.

Low load factor with sharper summer peak demand.



## 2. Development of Market Reform so far (1)

Japan started the electricity market reform in 1995.

Wholesale bidding system (introduced in 1995)

- Independent Power Producers can tender bids for wholesale electricity purchased by incumbent GPUs.

Retail market opening (introduced in 2000)

- 26% of the total retail market is liberalized. Large customers ( ≥ 2,000kW, 20kV) can choose their suppliers.

Wheeling tariffs (introduced in 2000)

- The Electricity Utility Industry Law prescribes that GPUs calculate wheeling tariff according to the wheeling tariff calculation rule and notify it to the METI. The wheeling tariff calculation rule is issued by METI as ministerial ordinance, and METI issues a change order to GPUs, if notified tariff violates this rule. Thus, Japan adopts r-TPA system.

Regulatory institution (introduced in 2001 - 2002)

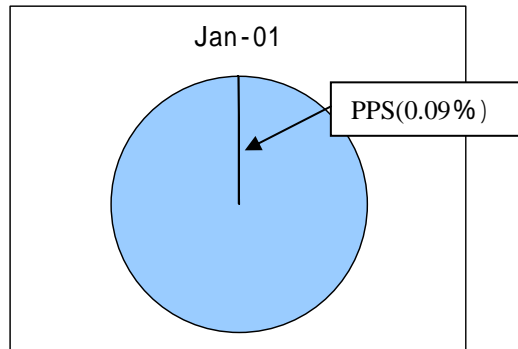
- Govt (METI) separates its policy making and regulatory activities into two divisions within METI. METI also formulates competition guidelines and settle disputes jointly with Fair Trade Commission.

## 2. Development of Market Reform so far (2)

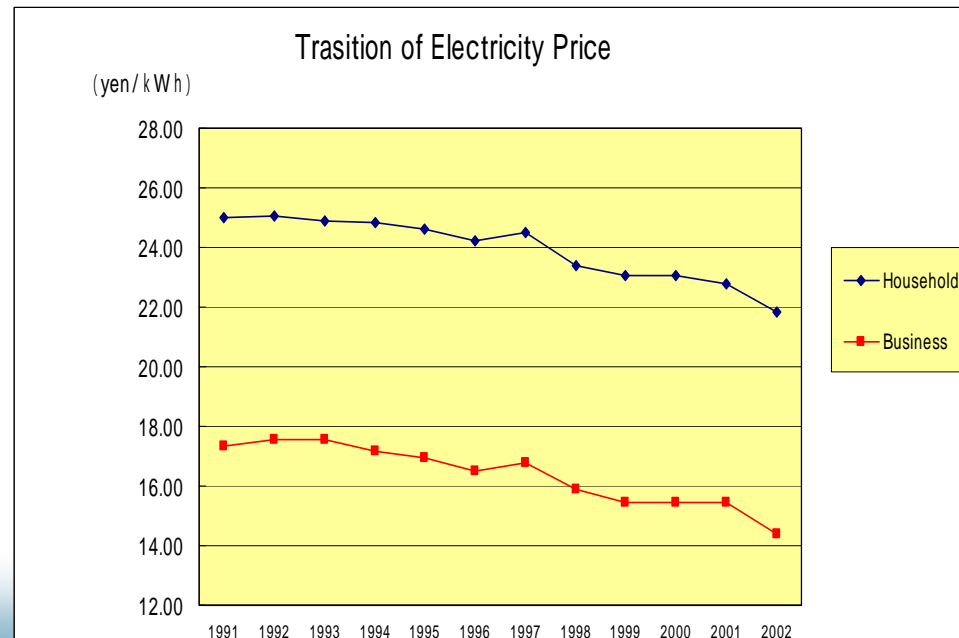
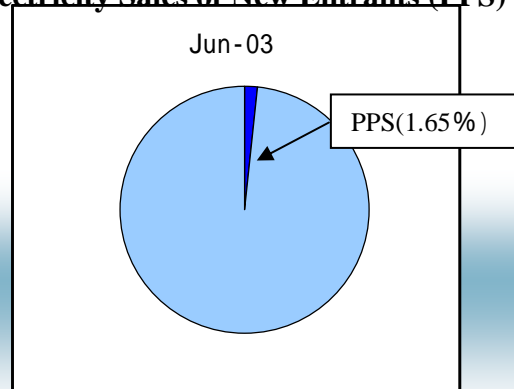
IPPs generation capacity now amounts to 7GW.

New entrants (PPS) have caused competition between PPS and incumbent GPUs, and even among incumbent GPUs.

Electricity prices are steadily declining because incumbent GPUs address more efficient operation.

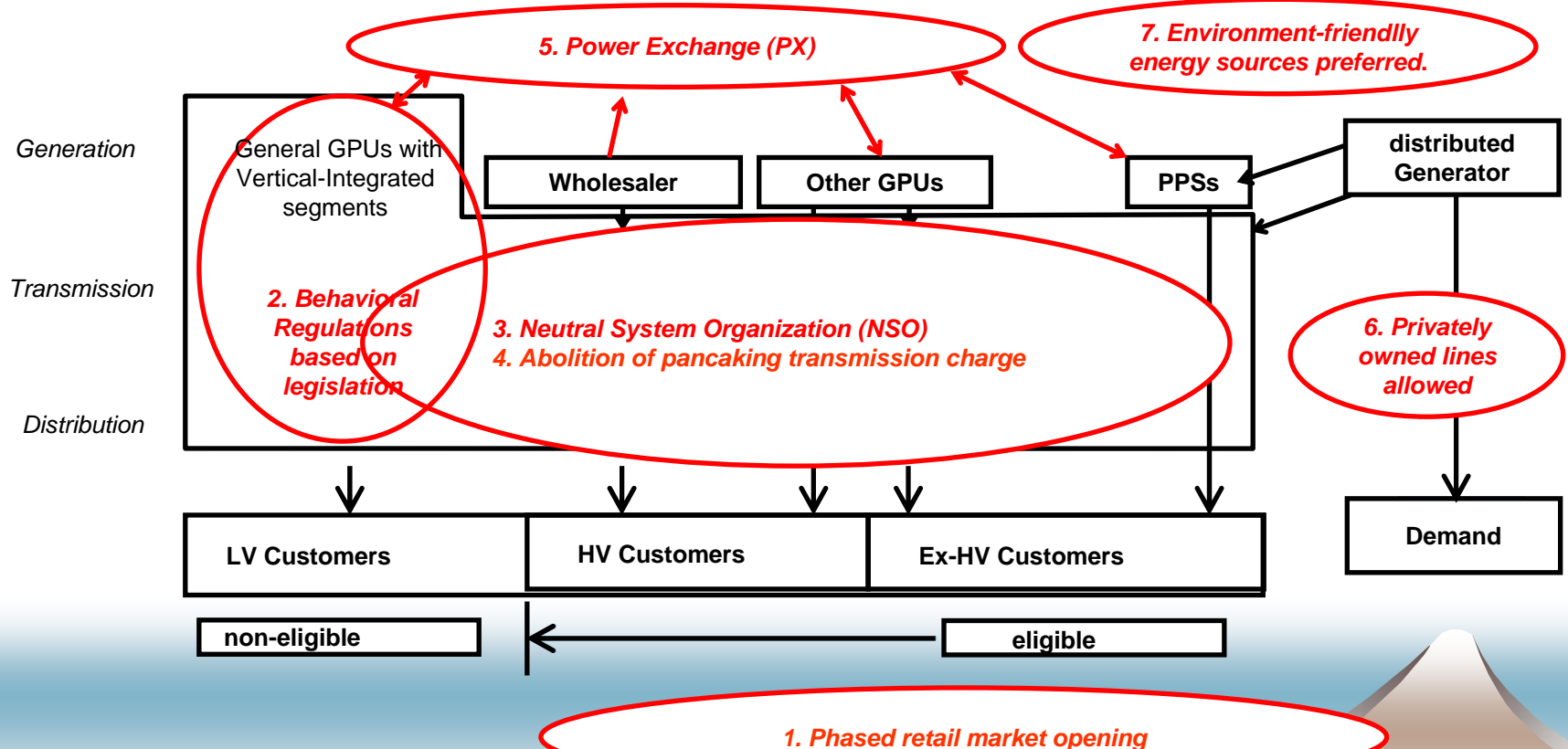


**Electricity Sales of New Entrants (PPS)**



### 3. Planned Market Reform (1)

Japan stipulated the market reform plan in the revised law in June 2003, taking steps for further liberalization over the next five years. The latest reform plan features the following seven points:



### 3. Planned Market Reform (2)

#### 1. Phased retail market opening (timetable clarified)


- 40% of the retail market will be liberalized ( 500kW) in 2004.
- 63% of that will be liberalized ( 50kW) in 2005.
- Discussion for full market opening will start in 2007.

#### 2. Behavioral Regulations based on legislation

- The latest reform plan decides not to impose 'Structural Regulations', such as legal or ownership separation of generation and transmission, on GPUs.
- Instead, 'Behavioral Regulations' is to be introduced and relevant legislative measures, such as account unbundling obligation, will be put in place.
  - (a) prohibition of using information for the purposes other than the prescribed purpose (information firewalls)
  - (b) prohibition of cross subsidization between transmission and other functions
  - (c) prohibition of discriminatory treatment

## 3. Planned Market Reform (3)

### 3. Establishment of Neutral System Organization (NSO)

- NSO, with participation of incumbent utilities, new entrants and persons from academic fields, will be established to manage transmission and distribution matters at the beginning of Apr 2004. It will be designated and supervised by the Govt (METI).
  - The main functions are expected as follows:
    - (a) preparing operational rules that govern, e.g., transmission and distribution facility development, network access, system operation and information disclosure
    - (b) arbitration and dispute settlements between network users and the transmission and distribution divisions of GPUs
    - (c) operating network information systems that record, e.g., available transmission capabilities
    - (d) providing a central dispatching liaison office
    - (e) providing a forum for the industry to discuss inter-regional interconnection line improvements
    - (f) evaluating system reliability
    - (g) preparing and disseminating statistical data
    - (h) carrying out research on power systems
- 



### 3. Planned Market Reform (4)

#### 4. Abolition of pancaking transmission charges

- At present, power suppliers are obliged to pay to all the network owners for wheeling tariffs on the way from its power plants to the final consumer. This increases transmission charges (pancaking problem).
- The transmission charges will be abolished. Instead, they will be integrated into the connection charges and a so-called postage stamp system will be introduced in each demand region.
- The measures for settlement between suppliers will be introduced to ensure covering cost.

#### 5. Establishment of Power Exchange (PX)

- PX will be established on a national scale made up of day-ahead market and forward market in 2005.
- GPUs will not be compulsorily required to participate in PX but they are determined to voluntarily provide their initial slot into it.

### 3. Planned Market Reform (5)

#### 6. Promotion of Distributed Power Generation

- The construction of privately-owned lines from DPG is to be allowed, subject to notification of Govt (METI), to promote distributed power generation.

#### 7. Treatment of environment-friendly energy sources such as nuclear

- Nuclear, hydropower and geothermal power will be given priority access to the grid network to promote investments in these technologies and facilities.
- Evaluation on cost structure in all aspects of back-end operations and overall profitability of nuclear power generation, and suitable economic measures will be examined by the end of 2004.

## 4. Findings (1)

### Pursuit of the best model on a step-by-step basis

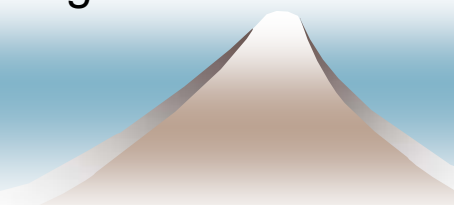
Importance of balancing energy policy goals: energy security  
environmental protection and economic efficiency

- Recent incidents remind us of the importance of energy security (especially investment for transmission).
- Climate change must inevitably be addressed.

### Inherent conditions

- Isolated location with no international connection
- Scarce indigenous resources and heavy dependence on imported energy resources

### Step by step approach

- Japan adopts phased market opening while establishing Neutral System Organization and Power Exchange.
  - Constant review of the effectiveness of liberalization and regulation.
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## 4. Findings (2)

### Regulation and Self-regulation

#### Necessary regulations in the liberalized market

- Given incentives for investment, GPUs won't be imposed on 'Structural Regulations' such as legal or ownership separation.
- Instead, Regulator will introduce 'Behavioral Regulations' for transparency and non-discriminatory.
- In addition, Regulator will set more clearly-defined guidelines for transmission tariffs to enhance nation-wide electricity transactions.

#### Roles of regulatory institutions in the liberalized market

- Roles of regulatory institutions in 'Transmission' are designed as follows:
  - Govt (METI's regulatory sector) as 'Regulator' for transmission tariffs based on Electricity Utility Law
  - FTC as 'Regulator' for fair trade based on Anti-Monopoly Law
  - NSO as 'Self-regulator' for management of transmission matters

*Policy model with mixtures of regulation and self-regulation ("regulated self-regulation")?*

