International Workshop on Global Energy Interconnections

Future Energy Balance and the Role of International Interconnections

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Company Profile

Customers (Number of Contracts)

29 Million

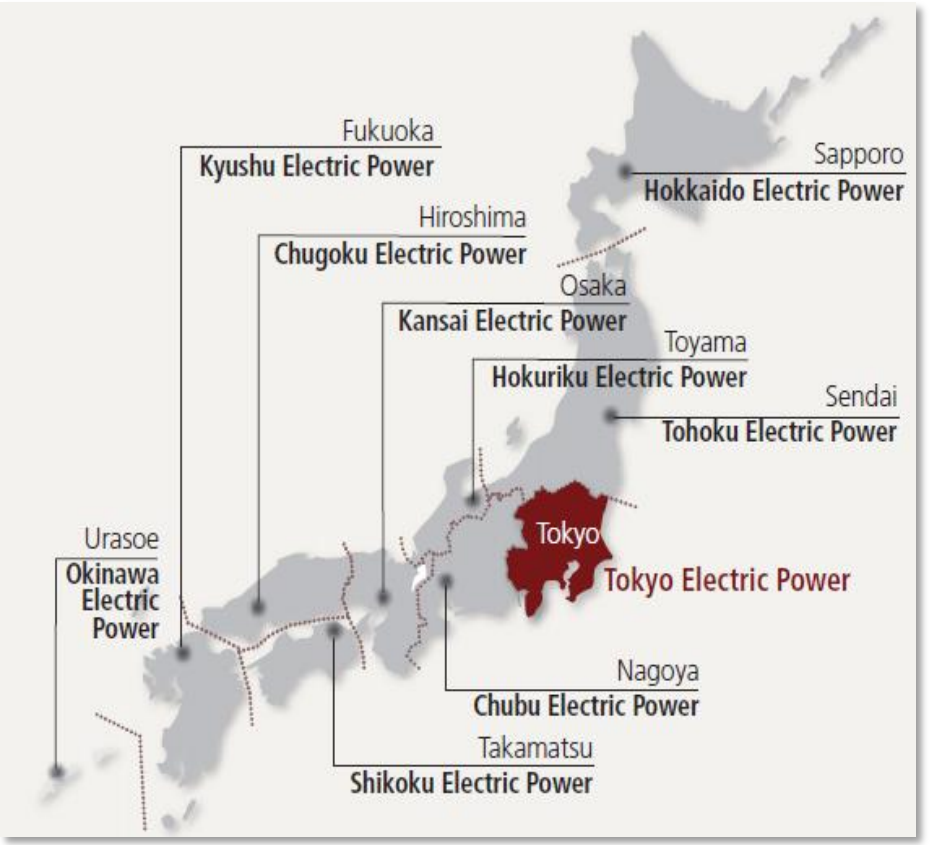
Annual Electricity Sales

247 TWh

Power Plant Capacity

66 GW

(as of FY2015 End)



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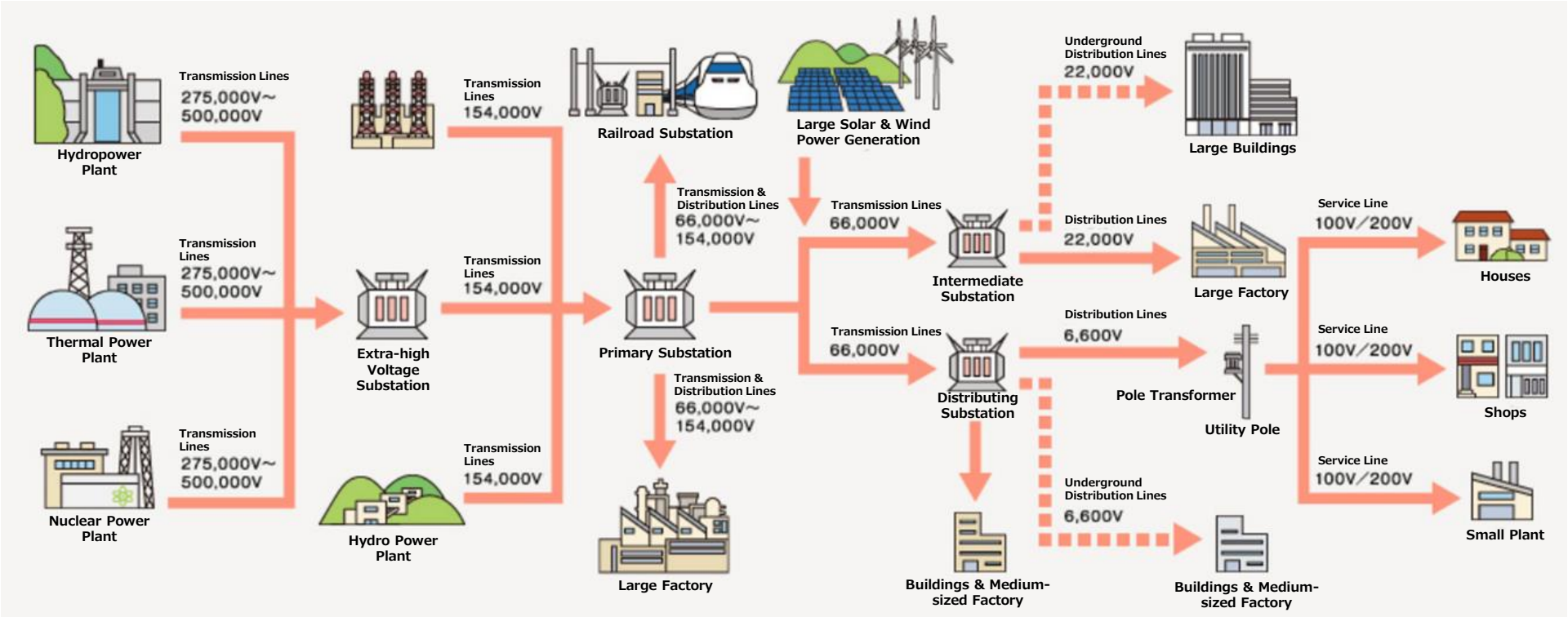
Supplying Electricity to Customers (Electricity System)

The electricity system is the platform that matches the “power demand” of customers in remote areas with “power generation” via transmission and distribution networks.

Create (Generation) | Send (Transmission and Distribution of Electricity) | Use (Demand)



Generation Facilities | Transmission Facilities | Distribution Facilities | Customer Facilities

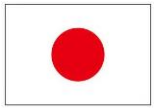
Energy Business Drivers (The 4 “Ds”)

Deregulation

Decentralization

Decarbonization

Digitalization



Depopulation

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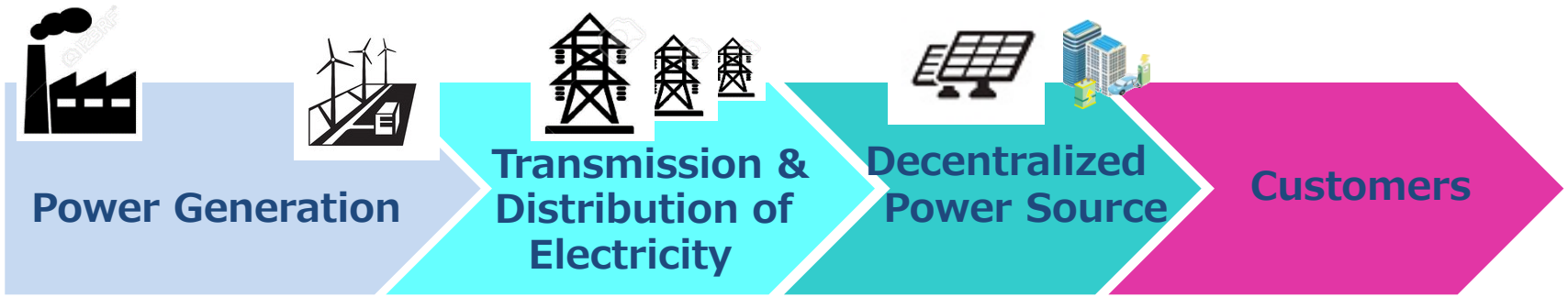
Transformation of the Energy Value Chain



Optimizing operation & maintenance
Downsizing assets

Energy management
Optimal facility operation & maintenance service

Decommissioning & nuclear safety

Platform "connecting" various power sources, such as decentralized power sources and EV, with customer facilities

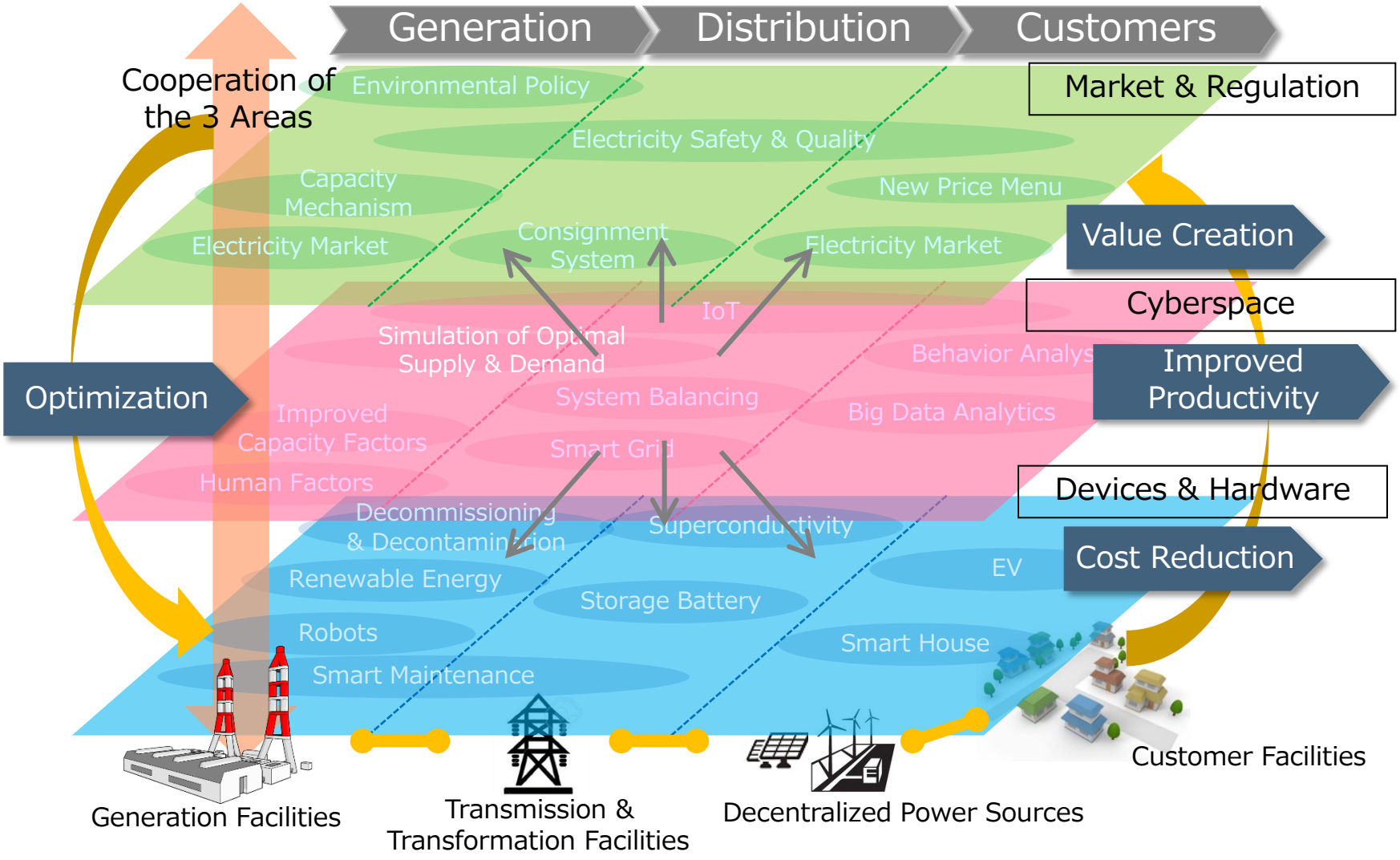
Expansion of low-carbon power source

Integration of upstream and others & overseas development

Increasing productivity of customers & creation of new services

Expanding "flexibility" to adjust fluctuations of supply and demand

Digitalization of the Energy Business



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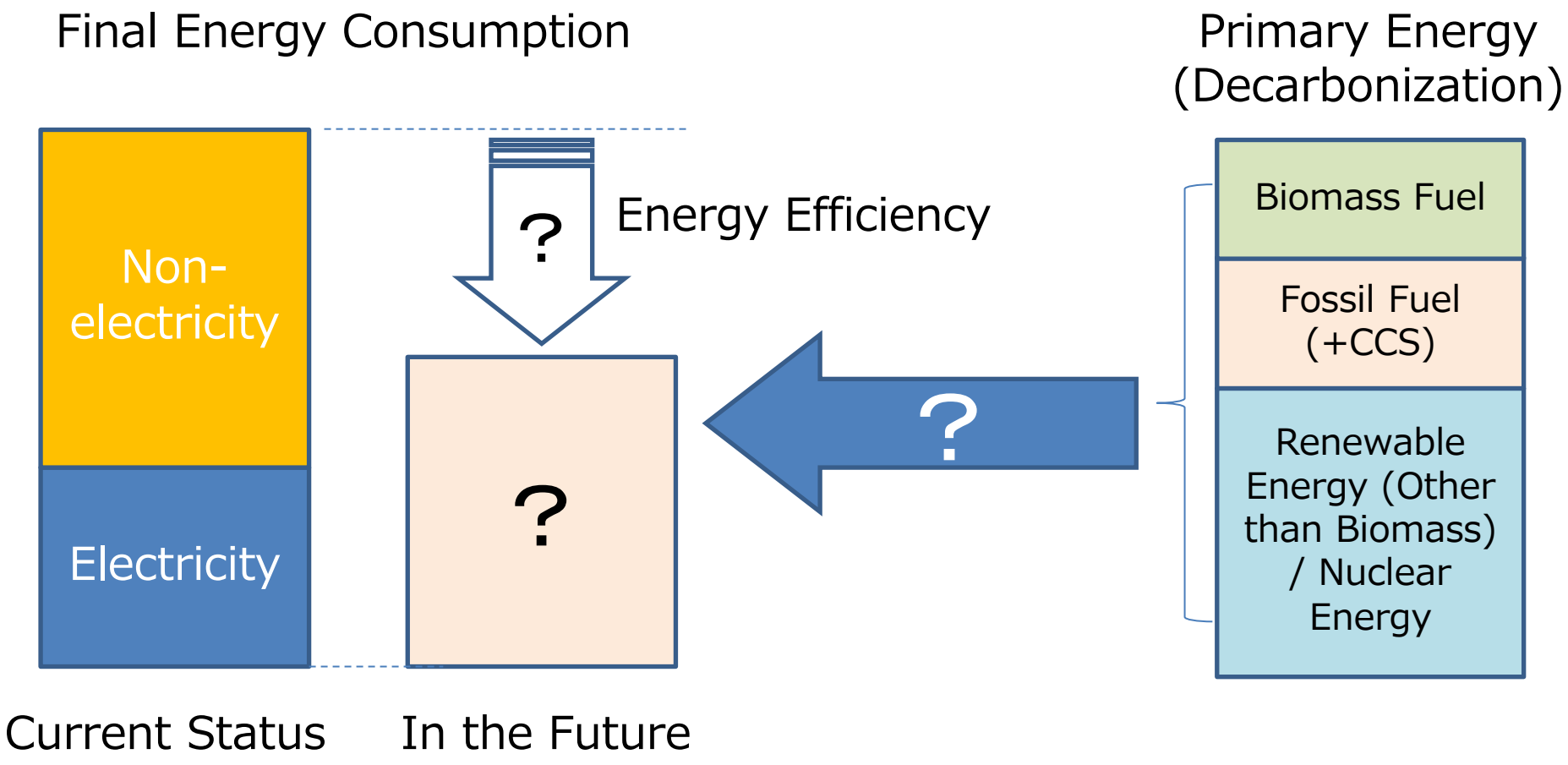
Road to CO_2 Net Zero Emissions



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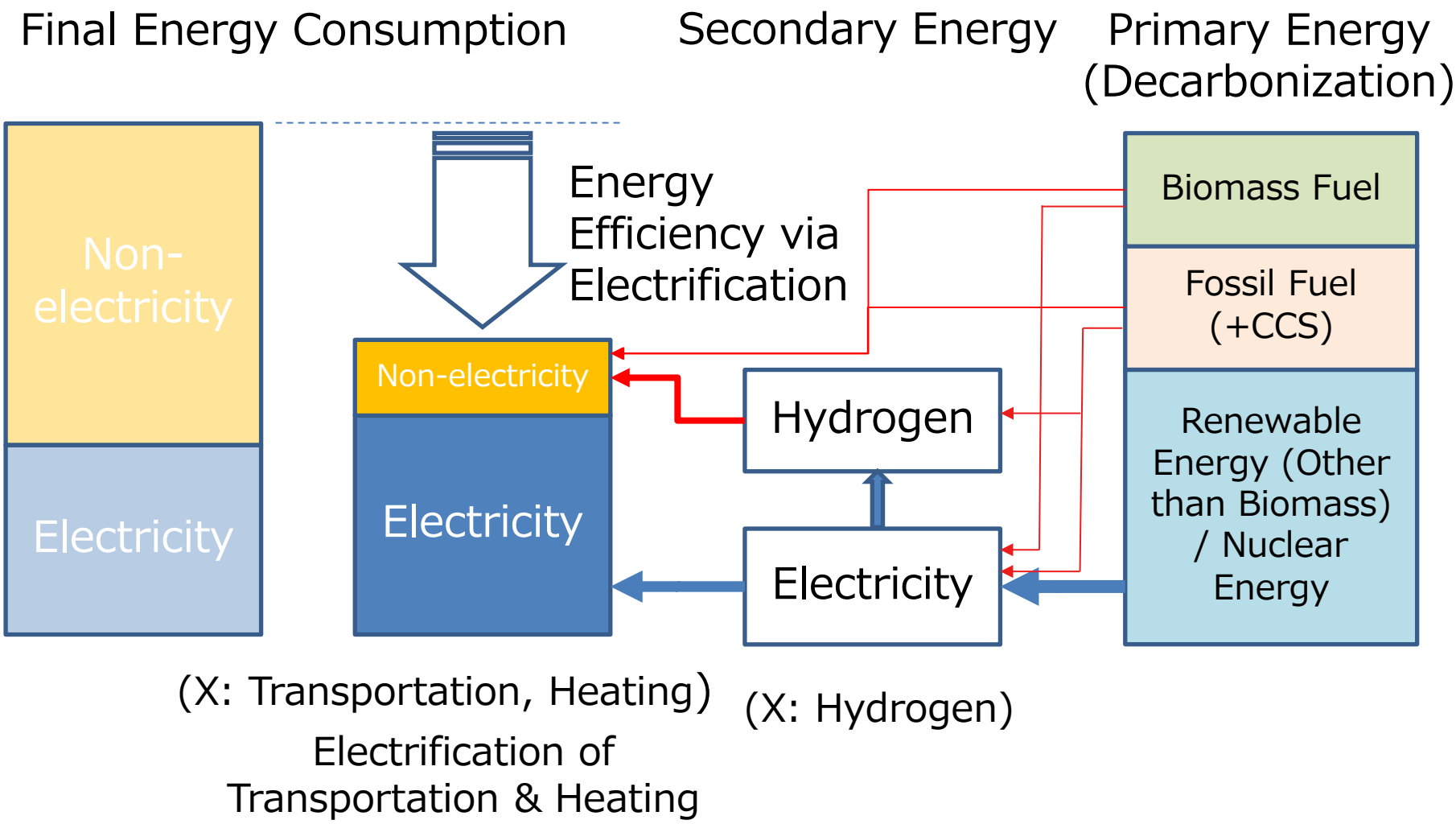
Road to CO_2 Net Zero Emissions: Power-to-X Scenario



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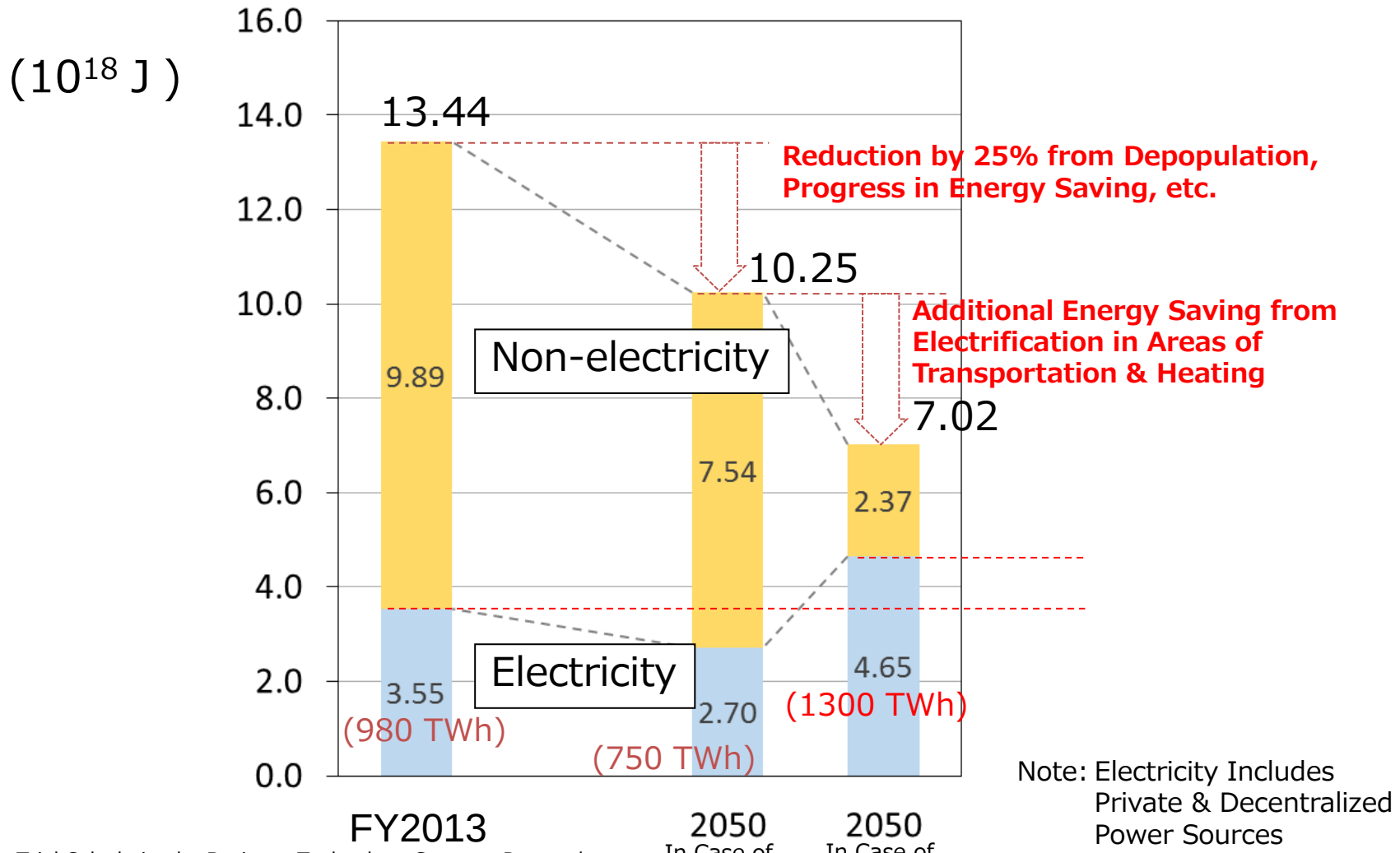
Trial Calculation Example of Japan's Energy Balance in 2050

Final Energy Consumption in 2050



Note: Electricity Includes Private & Decentralized Power Sources

(Source) Trial Calculation by Business Technology Strategy Research Institute, Tokyo Electric Power Company Holdings, Inc.

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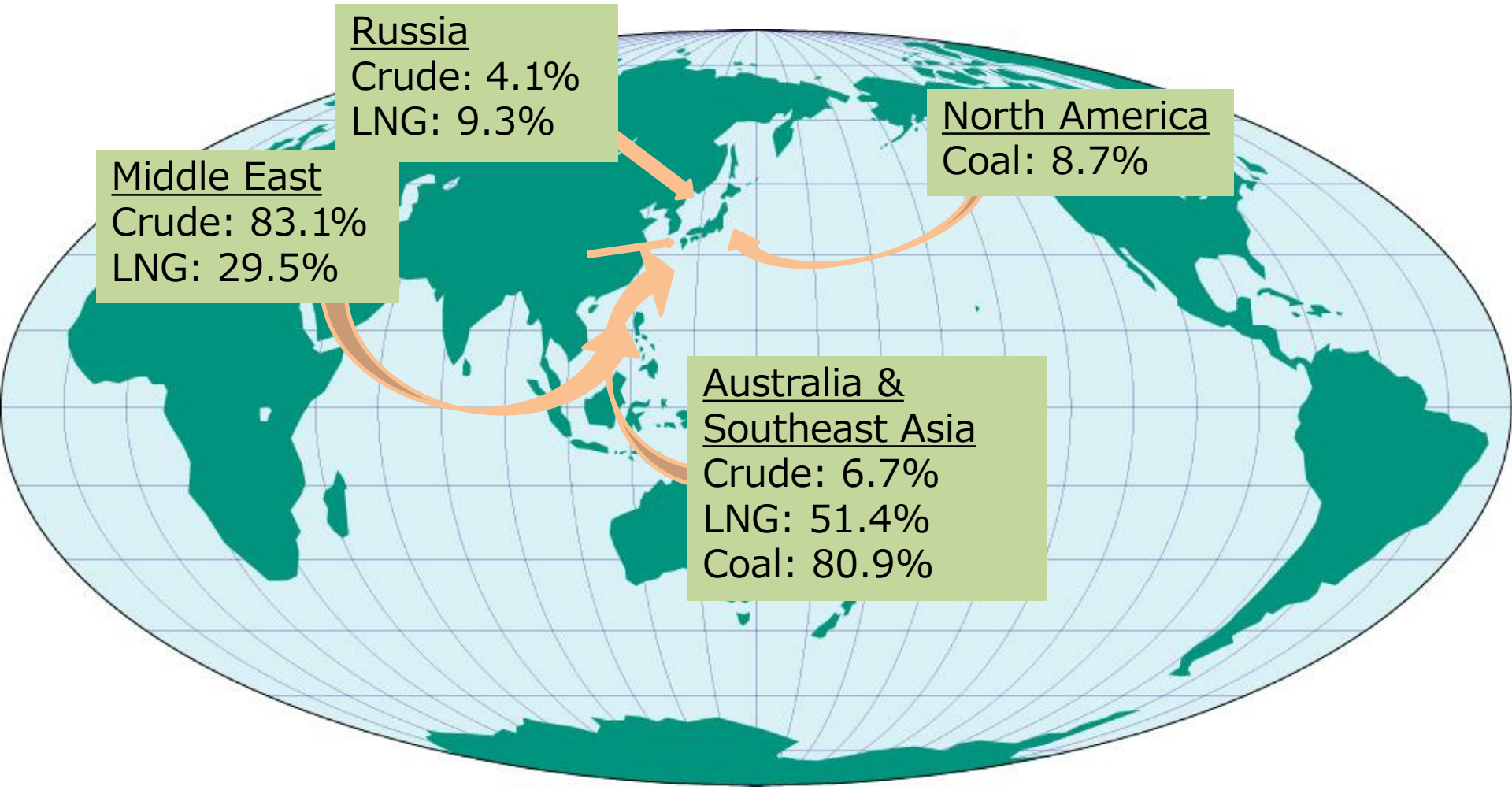
Japan's Incoming Trade Flow of Primary Energy (FY2011)



(Source) Agency for Natural Resources and Energy: Based on the Energy White Paper 2013

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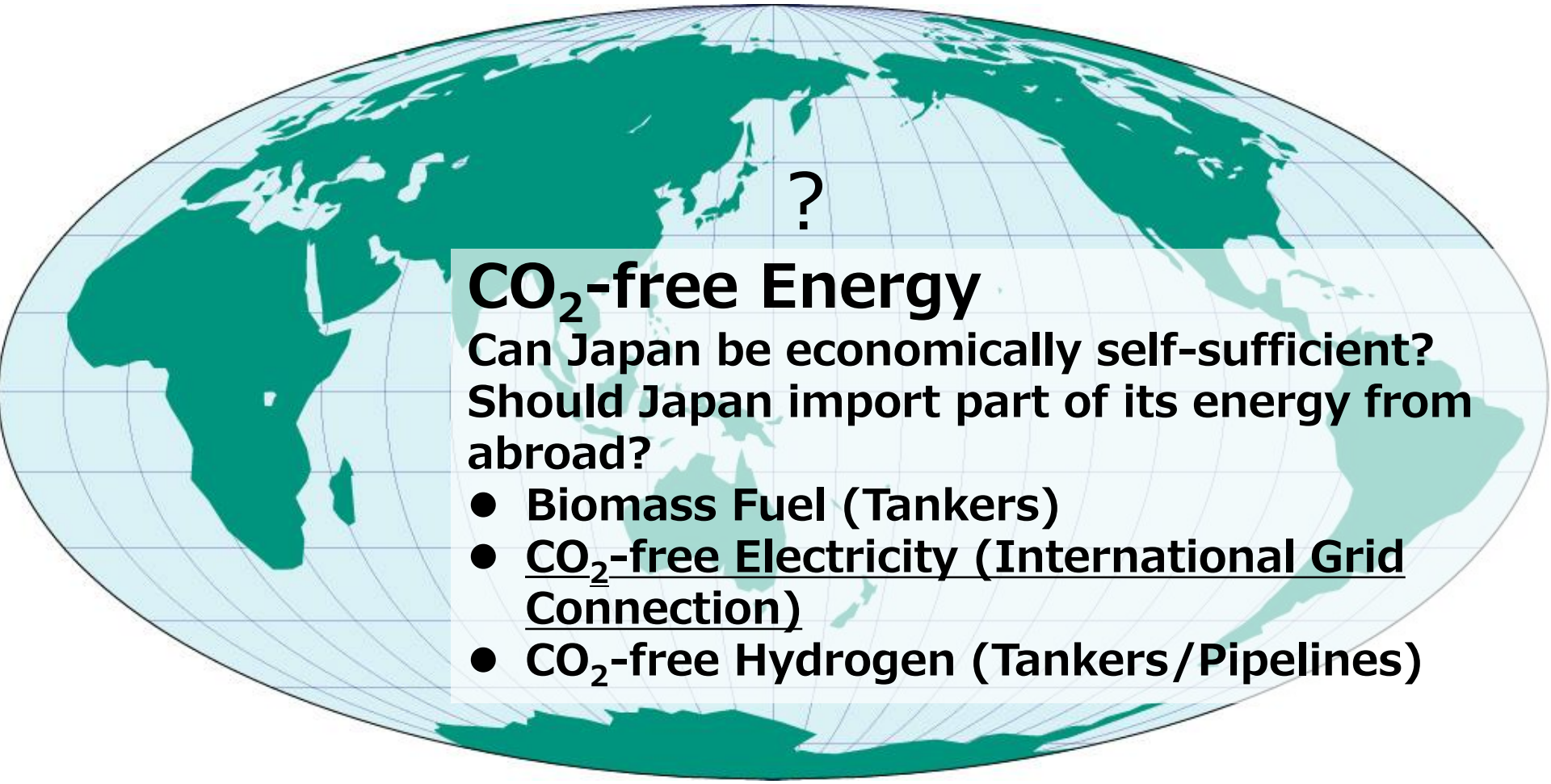
Energy Imports under CO_2 Net Zero Emissions



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CO_2-free Energy

Can Japan be economically self-sufficient? Should Japan import part of its energy from abroad?

- **Biomass Fuel (Tankers)**
- **CO_2-free Electricity (International Grid Connection)**
- **CO_2-free Hydrogen (Tankers/Pipelines)**

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Expected Roles of International Grid Connection

1. Imports of Non-carbon Electricity

- Required capacity will be reduced as progress is made in decentralization of energy supply.
- Competition with hydrogen transportation, etc.

2. Expansion of Flexibility in Energy Supply & Demand

- Overall reduction of the need for flexibility resources as fluctuations in supply and demand are averaged out through wider-area networking
- Competition with energy storage devices (including EV and heat-pump hot-water supply)

✓ Important to compare economic efficiency with other alternative means and to secure redundancy by connecting with multiple countries.

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Open Innovation Platform

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