International Workshop on Global Energy Interconnections

Future Energy Balance and the Role of International Interconnections

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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.



Energy Business Drivers (The 4 "Ds")

Deregulation

Decentralization

Decarbonization

Digitalization

Depopulation



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Transformation of the Energy Value Chain



Expanding "flexibility" to adjust fluctuations of supply and demand

Digitalization of the Energy Business





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(X: Transportation, Heating) (X: Hydrogen) Electrification of Transportation & Heating

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Trial Calculation Example of Japan's Energy Balance in 2050



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 CO₂ Net Zero Emissions

CO₂-free Energy

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

- Biomass Fuel (Tankers)
- <u>CO₂-free Electricity (International Grid Connection)</u>
- CO₂-free Hydrogen (Tankers/Pipelines)

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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