

# Power Grids in Japan

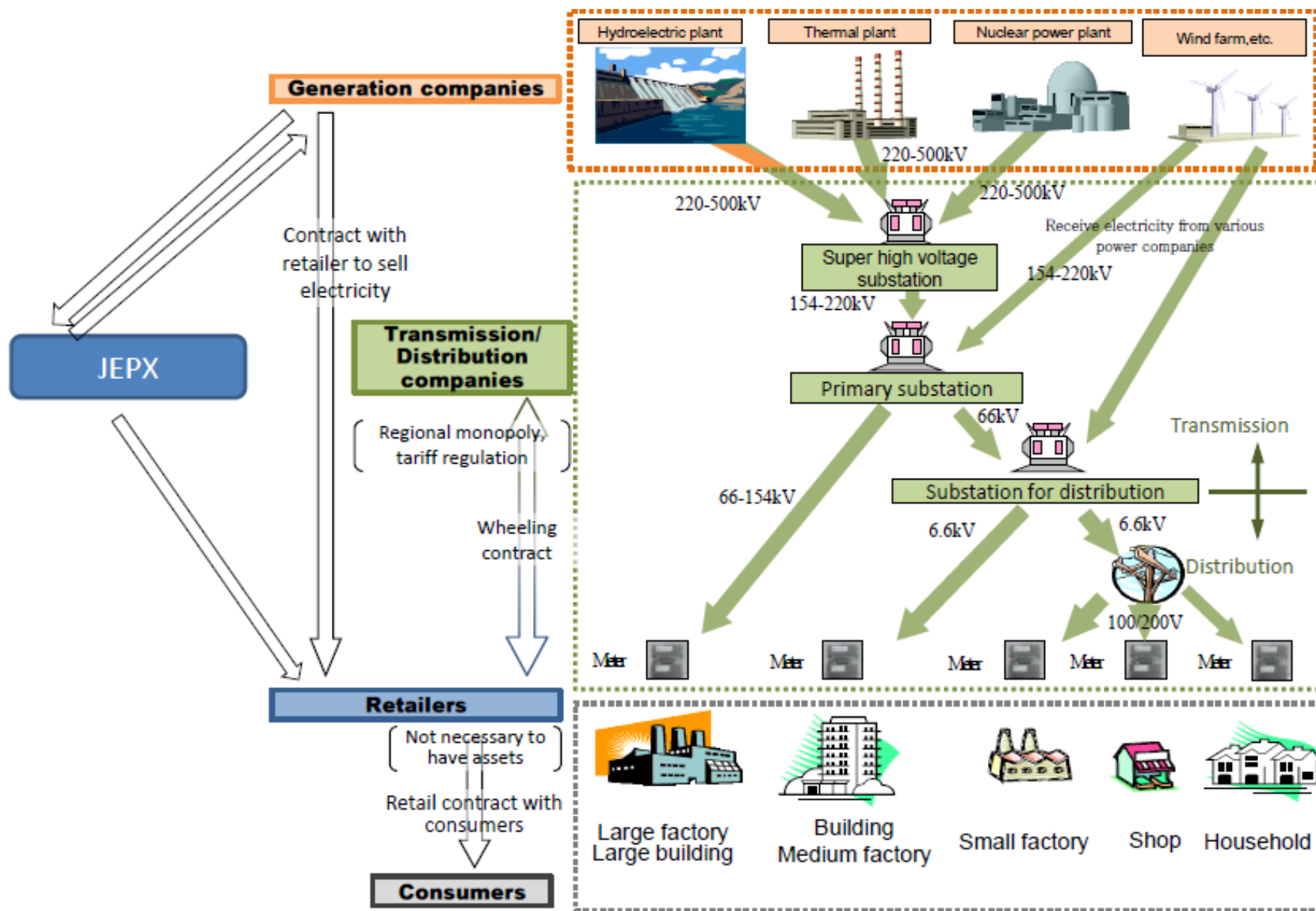


Visiting Professor, The University of Tokyo, Waseda University  
Central Research Institute of Electric Power Industry  
Deputy Associate Vice President Prof.Dr.Hiroshi Asano

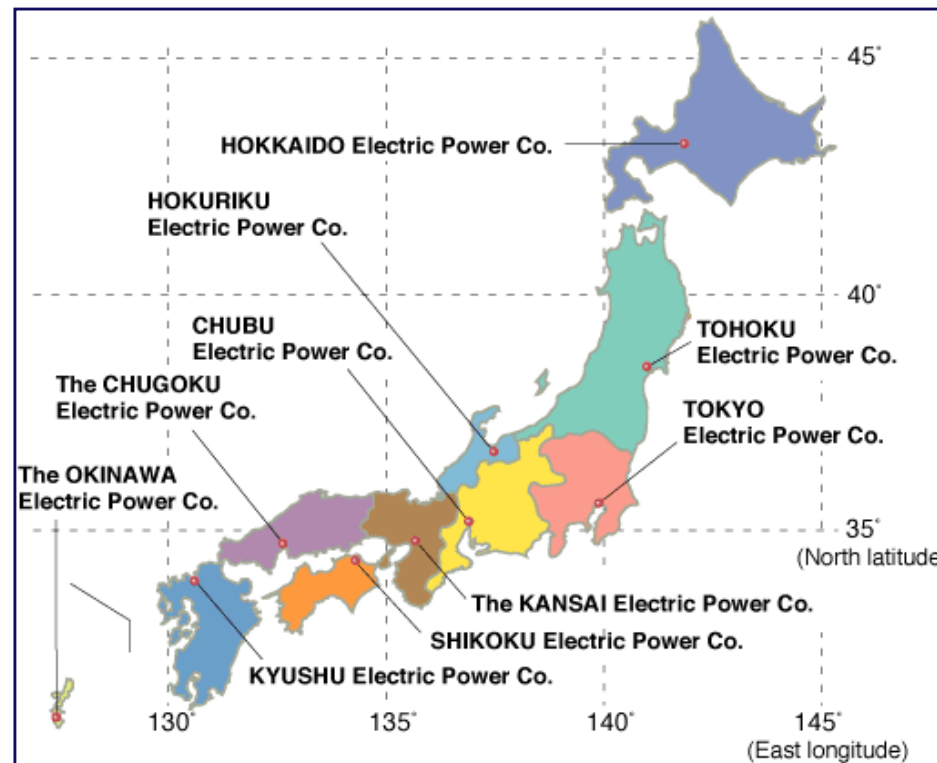
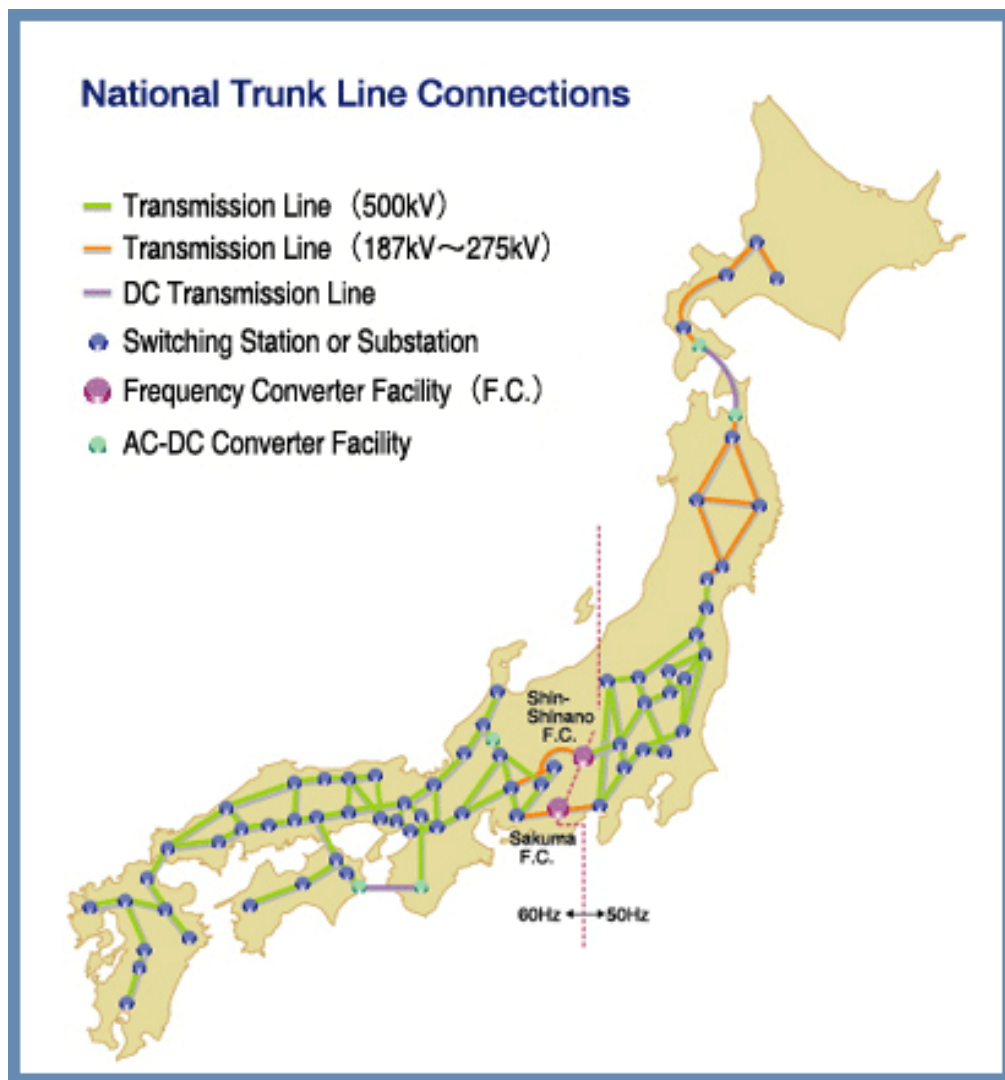
Energy Bridges between Russia and Japan

November 2015

# Power grids & electricity market in Japan



# Electric power system in Japan



Loosely coupled power systems and operations → Nation-wide operation by Organization for Cross-regional Coordination of Transmission Operators (OCCTO) since 2015

# Interconnection among general power utilities

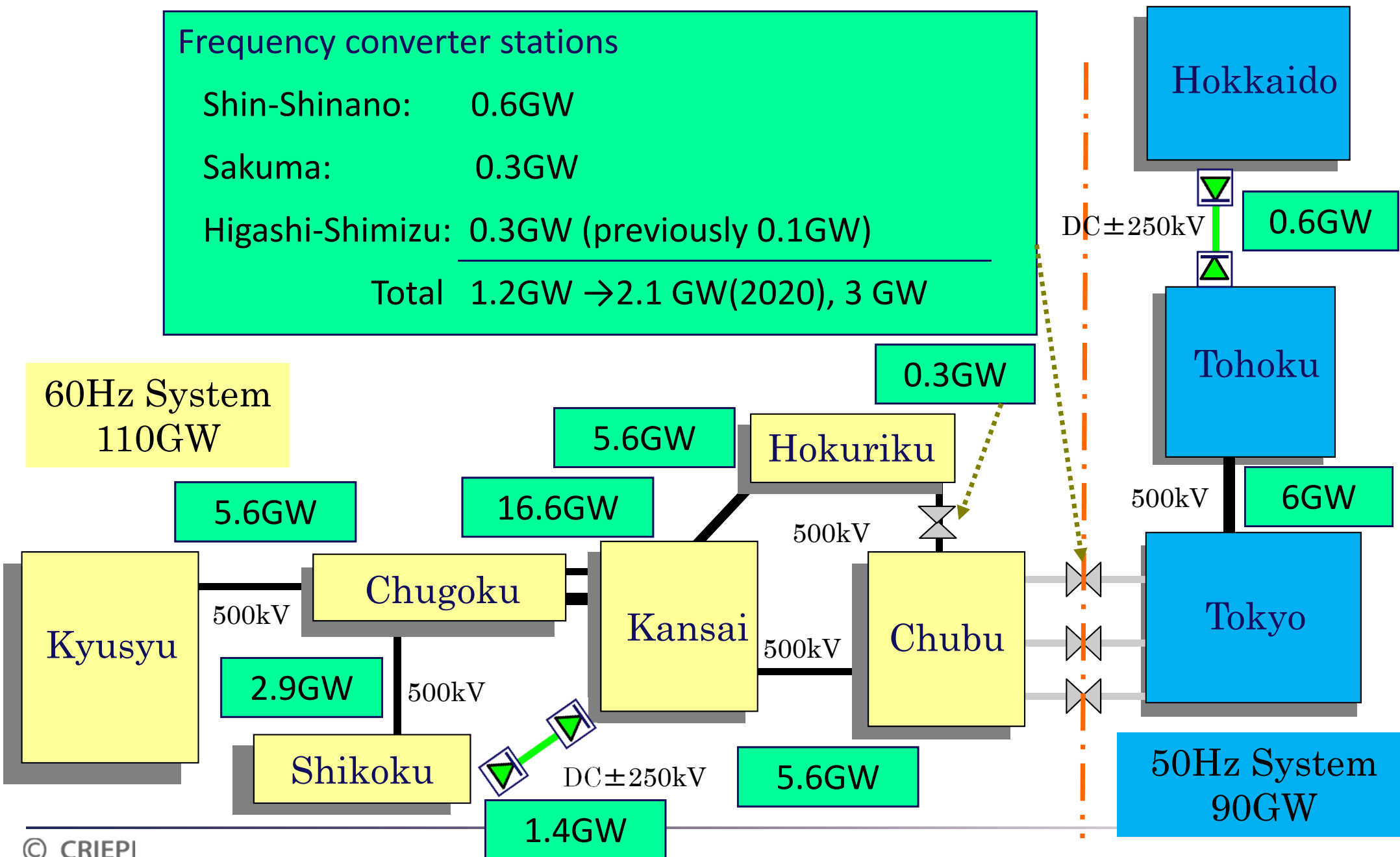
## Frequency converter stations

Shin-Shinano: 0.6GW

Sakuma: 0.3GW

Higashi-Shimizu: 0.3GW (previously 0.1GW)

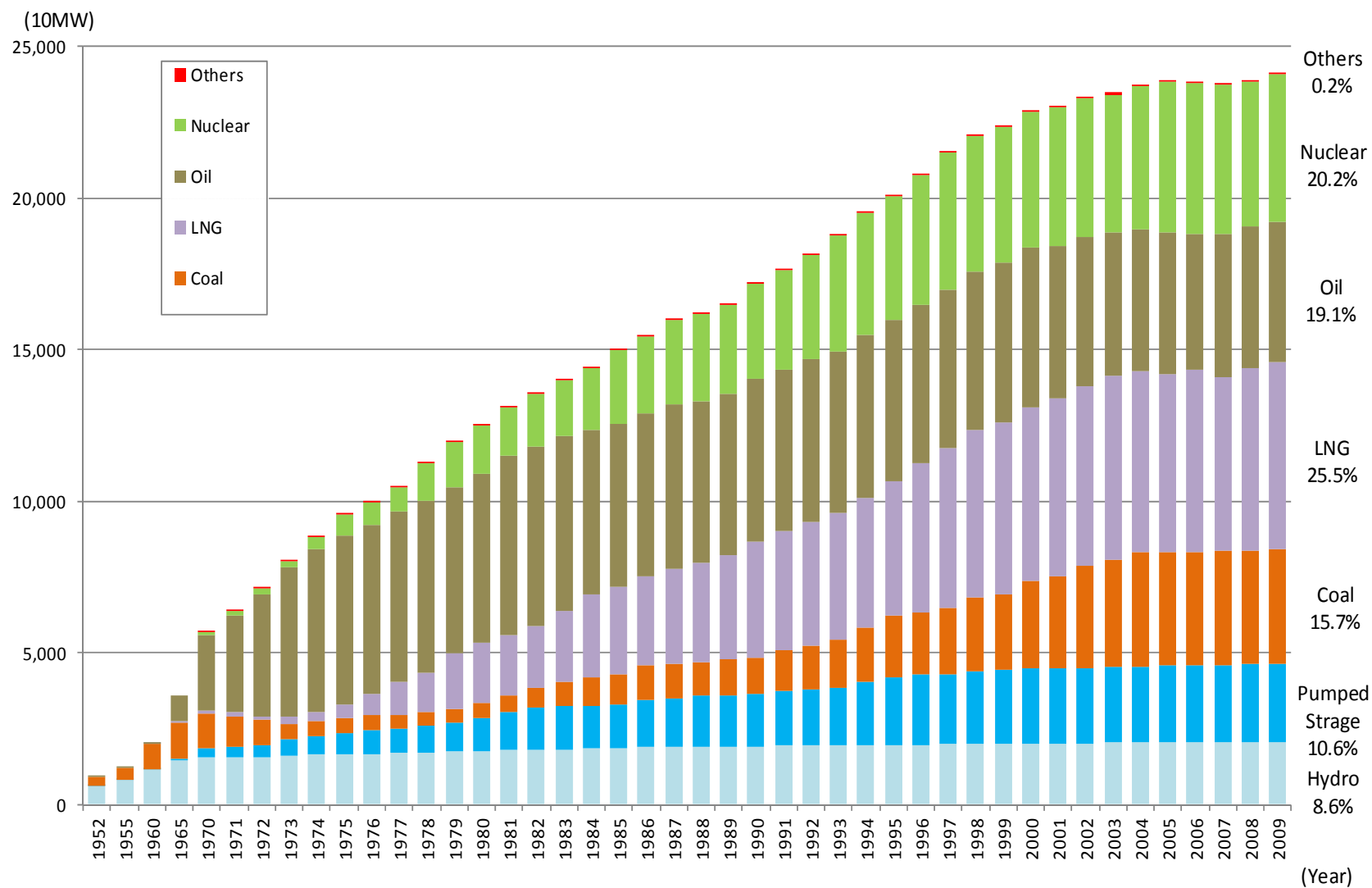
Total 1.2GW → 2.1 GW(2020), 3 GW



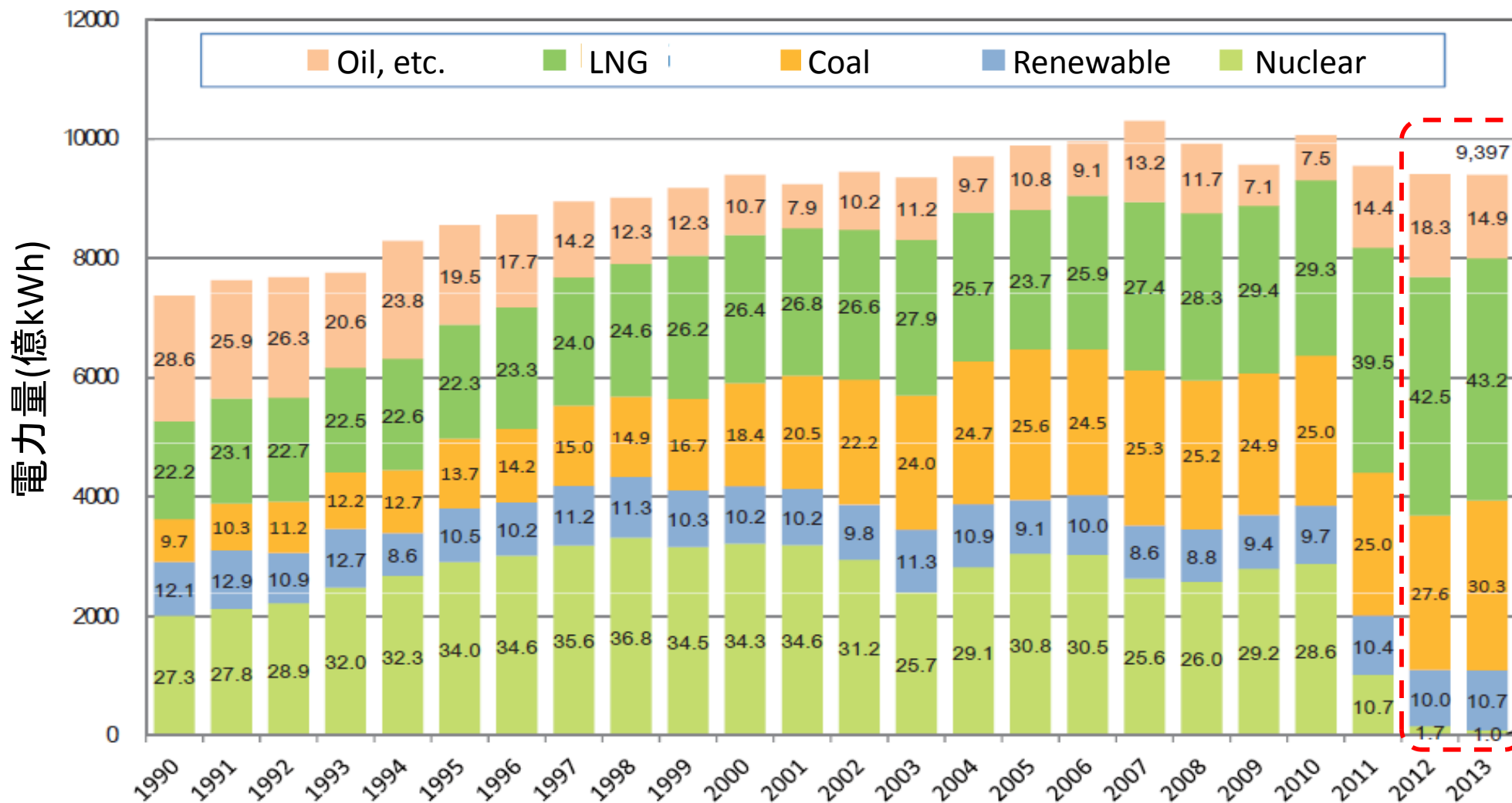
# Policies of the electricity regulatory reform

- ◆ Enhancing nationwide system operation in 2015
  - Establishing the Organization for Cross-regional Coordination of Transmission Operators (OCCTO)
  - Framework for development of interconnection
- ◆ Full retail choice and full liberalization of power generation
  - All customers, including household consumers, will be able to choose an electricity supplier in 2016
- ◆ Further securing neutrality of the transmission/distribution sector through the legal unbundling: 2020
  - Transmission/distribution company will be separated.

# Installed Capacity of 10 Japanese EPCOs



## Generation mix: 10EPCOs, in 100 M kWh LNG is dominant after Fukushima



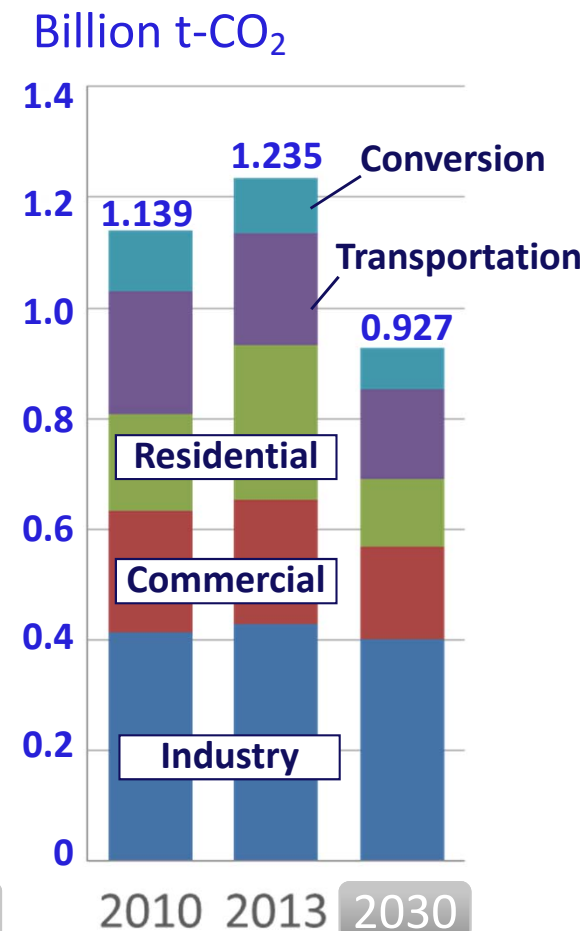
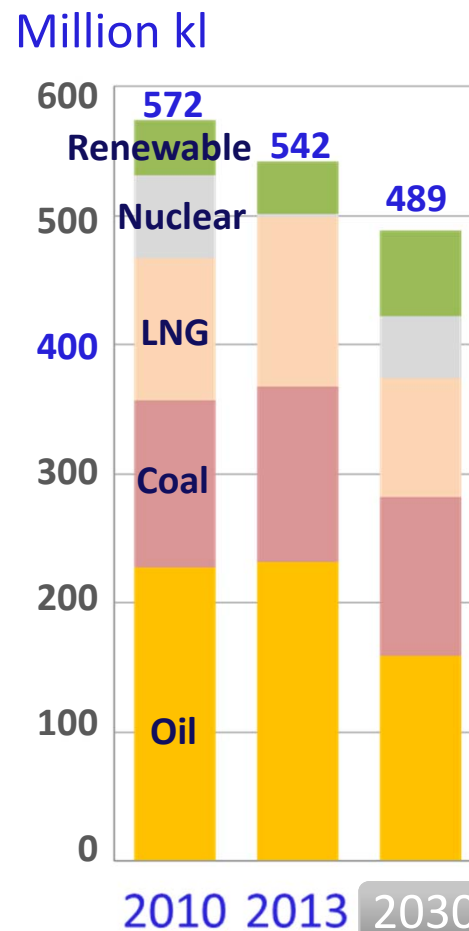
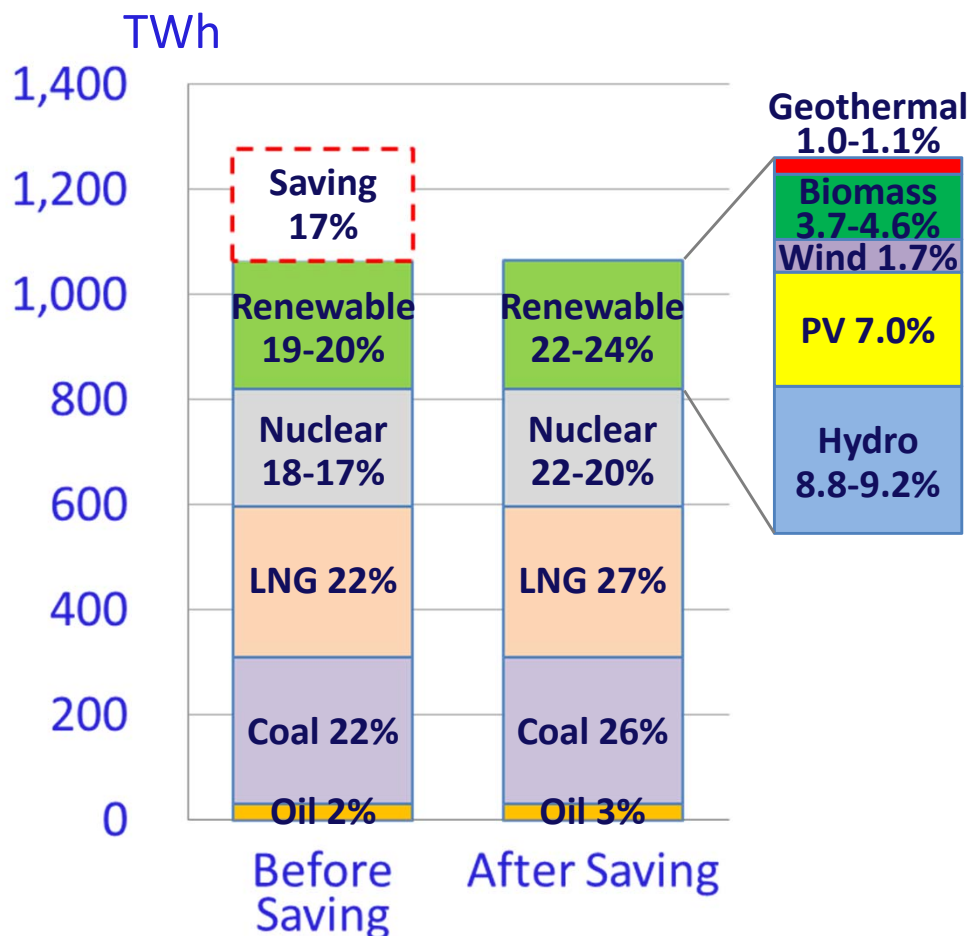
FEPC(2014)

# New Target of Power Generation Mix, Primary Energy and CO<sub>2</sub> emission in 2030

**Power Generation Mix**  
Diversification to  
four energy kinds

**Primary Energy**  
9.8% reduction  
from 2013 level

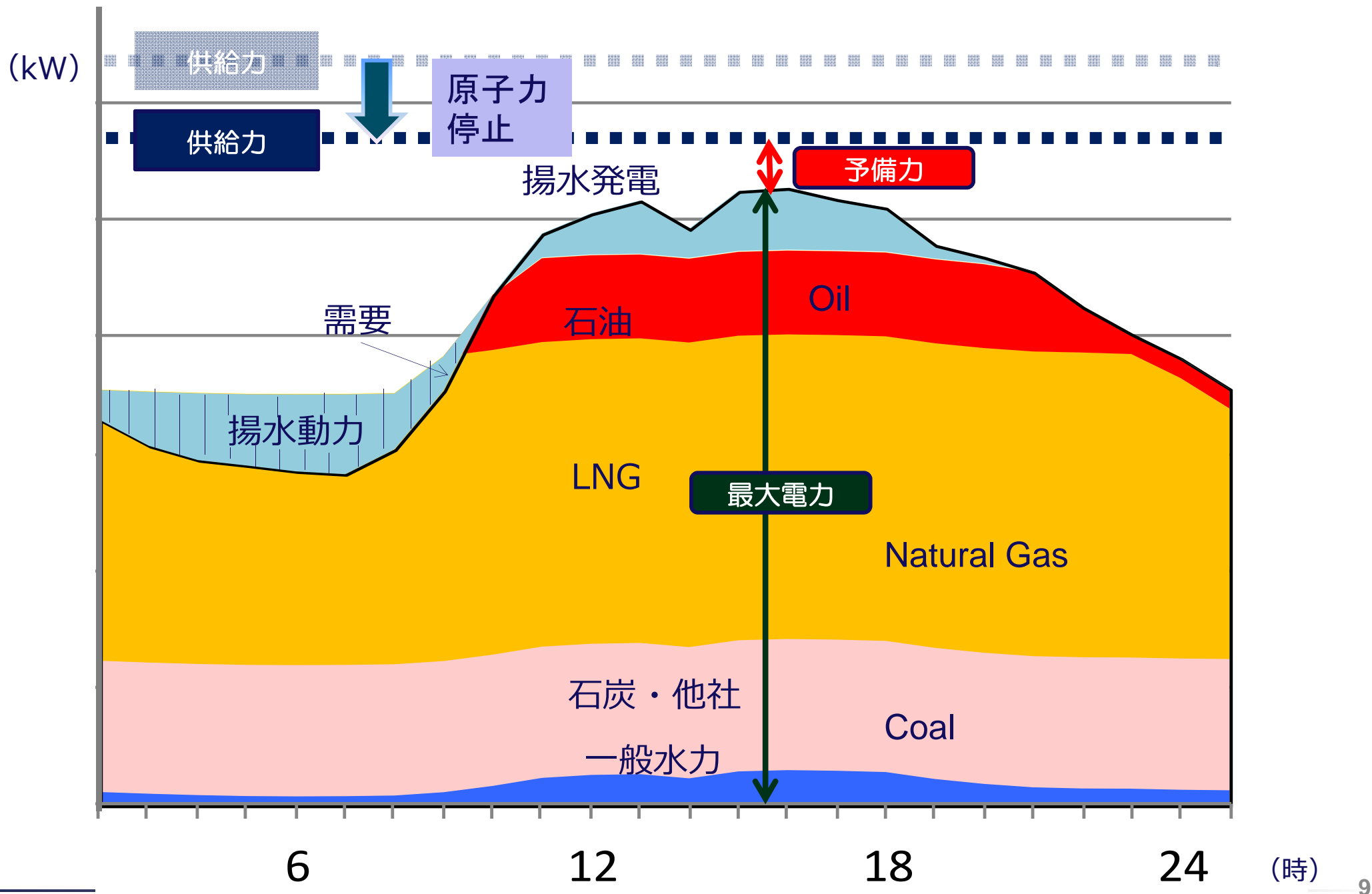
**Energy-origin CO<sub>2</sub>**  
24.9% reduction  
from 2013 level



(Source: Advisory Committee for Natural Resources and Energy)



# Economic Dispatch: case of Chubu EPCo



## Concluding comments

- ◆ For generators: imports from Russia as competitive LNG sources
- ◆ For T&D: international interconnections and inter-utility connections will be handled at OCCTO
- ◆ For retailers: stable supply and competitive price
- ◆ For RES integration: more flexible gas-fired generator preferred