

Sustainable Structures and Regulations for Electric Utilities

Background and Objective

The Great East Japan Earthquake in 2011 urged a revision of energy policy in Japan. This envisions not only the promotion of energy efficiency and the acceleration of the diffusion of renewable energy, but also the reform of the structure of the electric power industry as well as its rate system. For policy discussion on these issues to be beneficial for customers and to take into account a long-

term point of view, it is highly important to provide results of analyses based on objective research.

In this project, we aim to present a framework for the sustainable structure of the electric power industry and for the rate regulation that will reach a consensus in society, based on our research on the international experience of electric restructuring.

Main results

1 Case Studies of Electric Unbundling in the U.S.: Impacts on the Electric Utility Industry

After categorizing electric unbundling in the U.S., we selected three different states for case studies on the process of unbundling and the impact on the industry (Y11036). The unbundling in the U.S. involves the operational unbundling of transmission activities by establishing the Independent System Operator or Regional

Transmission Organization (ISO/RTO), and in some states it also involves the divestiture of generation assets (Fig. 1). ISO/RTOs without asset ownership have been more responsible for coordinating generation and transmission, but this is becoming a cause of concern, as it might increase inefficiency in the long run.

2 International Comparison of Electricity Prices Based on their Components with Country-specific Backgrounds

We overviewed the recent trend of electricity prices in key countries and investigated the factors behind price changes, such as the energy policy and generation mix in each country (Y11013). In Germany and Denmark, which promote renewable energy, electricity prices for household customers

are higher than those in Japan reflecting higher public charges (Fig. 2). We also showed that the price ratio of household and industrial customers tended to be increased in countries abolishing price regulation after liberalization, such as in the U.K.

3 Issues Regarding Electricity Rate Regulation in the U.K.: Network Tariffs and Social Tariffs

We investigated the network tariffs of the U.K., which previously focused on efficiency but has since changed to evaluate the effect on investment in the long term. We analyzed the effectiveness of this new network tariff system to ensure the long-term view of network companies

(Y11012). We also investigated the experience of social energy tariffs in the U.K. (Y11017) and discussed issues regarding the obligations of energy suppliers to offer discounted tariffs to low-income customers after market liberalizations (Table 1).

4 Residential Customer Attitudes toward Smart Meters and Home Solar Power Generation Systems

A questionnaire survey for residential customers in Japan was conducted to investigate customer acceptance and preference regarding electricity-saving measures by using electricity rate structures and smart meters (Y11016), along with customer preference regarding home solar power

generation systems (Y11029). As a result, it was found that less than a half of all customers, who didn't choose time-of-use (TOU) rates, answered that they would like to consider choosing TOU rates (Fig. 3).

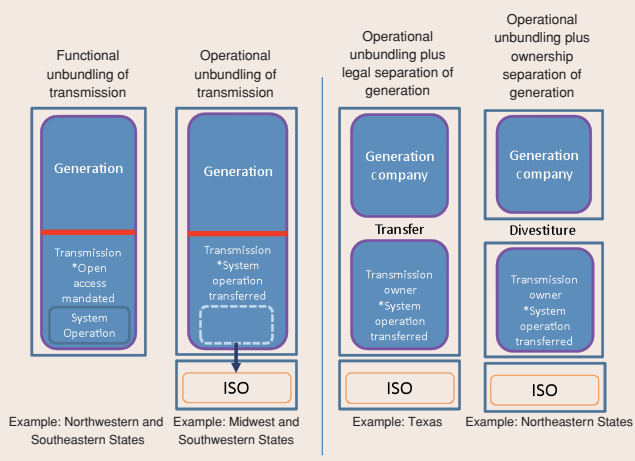


Fig. 1: Categorization of electricity unbundling in the U.S.

In the U.S., electricity unbundling involves the operational unbundling of transmission from generation by establishing the Independent System Operator (ISO) or Regional Transmission Organization (RTO), and in some states it involves legal or ownership separation of generation assets as well. In recent years, the roles and responsibilities of the ISO/RTO without asset ownership have become even more important in ensuring short-term reliability as well as long-term transmission planning, but their inefficiency has been a cause of concern.

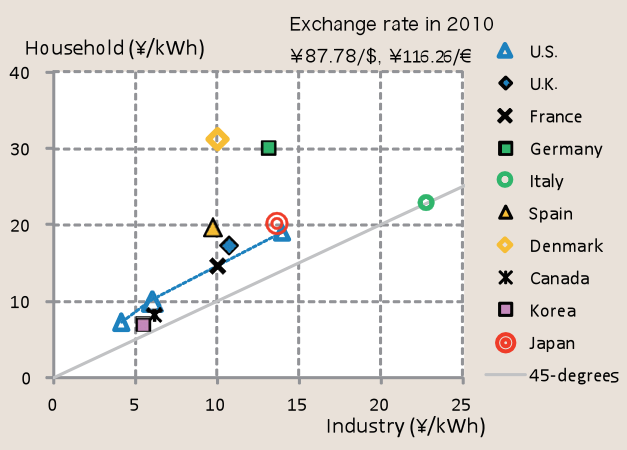


Fig. 2: Electricity prices for household and industrial customers in key countries (2010, including tax)

Electricity prices in Germany and Denmark are higher than those in Japan. This is attributed to higher public charges for household customers in these countries.

Note: The data shown consists of the average unit prices provided by the IEA. For Germany, Spain, and Korea, the prices from 2009 are shown. For France, the data obtained from Eurostat is shown. For the U.S., the data in states with higher and lower prices are depicted and connected by a dotted line.

Issues	Details
Suppliers cannot determine the eligible customers.	- Customers eligible for social tariffs are not necessarily fuel-poor households. - Suppliers cannot utilize public data such as that regarding pensions.
Social tariffs do not eradicate the root cause of fuel poverty.	- Social tariffs do not contribute to the energy efficiency of home buildings and appliances, which is the root cause of fuel poverty. - Unlike energy efficiency assistance, the effect of social tariffs does not last for long. - Social tariffs may discourage household energy conservation incentives.
Cost allocations are difficult.	- Cost was recovered through utility bills, which, in turn, expanded customer burden. - In financial deficits, it is unrealistic to compensate the cost from the Treasury.

Table 1: Issues regarding social tariffs in the U.K., 2008-2011

In the U.K., after household electricity and gas bills rapidly increased since 2004, energy suppliers offered social tariffs, in response to political pressure from the government. Judging from the current situation where energy tariffs are discounted to protect household customers, some commentators now consider the liberalization of household energy markets as unsuccessful.

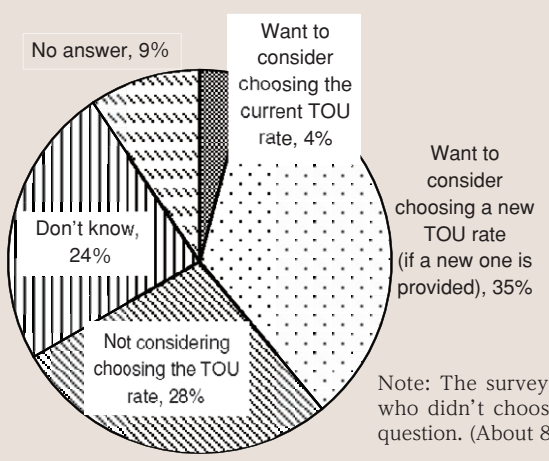


Fig. 3: Residential customer preference regarding TOU rates

Only 4% of all customers, who didn't choose current time-of-use (TOU) rates, answered that they would like to consider choosing current TOU rates within one year. About 40% of customers answered that they would like to consider choosing TOU rates if new TOU rates, in which time slots could be suitable to customer life styles, would be provided, in addition to current TOU rates. It was found that customers who preferred choosing TOU rates would be willing to save peak electricity demand because of their high awareness of electricity conservation.

Note: The survey was conducted in October and November 2011. Respondents who didn't choose current TOU rates during the survey dates were asked this question. (About 80% of respondents, n=2,126)