An empirical analysis of electricity retail price changes in Europe – The effects of rising fuel costs and pass-through rates to customers –

Background

In 2007, escalating fuel prices dealt a heavy blow to the world economy. As well as petroleum products, commodity prices increased through their material transport and package costs. Electric power companies with fossil power plants also received a blow. In Japan, power companies can pass through fuel costs to customers based on a regulation. On the other hand, European power companies can subjectively decide it in the liberalized electricity market. Thus, only company managements know the shift rate to customers.

Objectives

After examining the development of electricity prices and main causes of their change, this study attempts to estimate the influence of increasing fuel cost on electricity retail prices and also to clarify the trend of fuel cost pass-through rates to customers from 1991 to 2007 for 14 EU countries.

Principal Results

(1) General trend of electricity prices:

In nominal terms, domestic prices in Europe increased moderately, while sharp rise was observed from 2000 for industrial prices.

(2) Composition of electricity charge:

Electricity charge consists of energy, network and service charges in addition to taxes and other public charges. In several countries such as Denmark, Germany, Netherland and Italy, the share of taxes and other public charges is comparatively high, i.e. more than 40%. However, in terms of growth, its impact is very limited. Energy charges (including fuel cost) should be the most important driving factor of recent electricity price rise (Fig. 1).

(3) Influence of fuel cost on electricity price:

When fuel cost rose by 1%, retail electricity prices increased by 0.24-0.52% as a common trend among 14 countries during the study period. In addition, prices increase was moderated by the increasing share of nuclear and hydraulic power and fuel stock, and accelerated by that of renewable energy (Tab. 1)

(4) Relative pass through rate:

In the years of rapid rise of fuel prices, i.e. 2000 and 2005, estimated pass-through rate of increasing fuel cost on electricity price fell broadly, and then it gradually increased (Fig. 2). This implies that power companies pass through their fuel costs with a few years delay. This would be determined by the customer strategy of power companies, in which they cannot change the retail prices drastically in a short period of time even in a liberalized market.

Future Developments

In the discussion on the institution of electric power industry, it will continue to be important to investigate the situation of foreign countries and to analyze them objectively.

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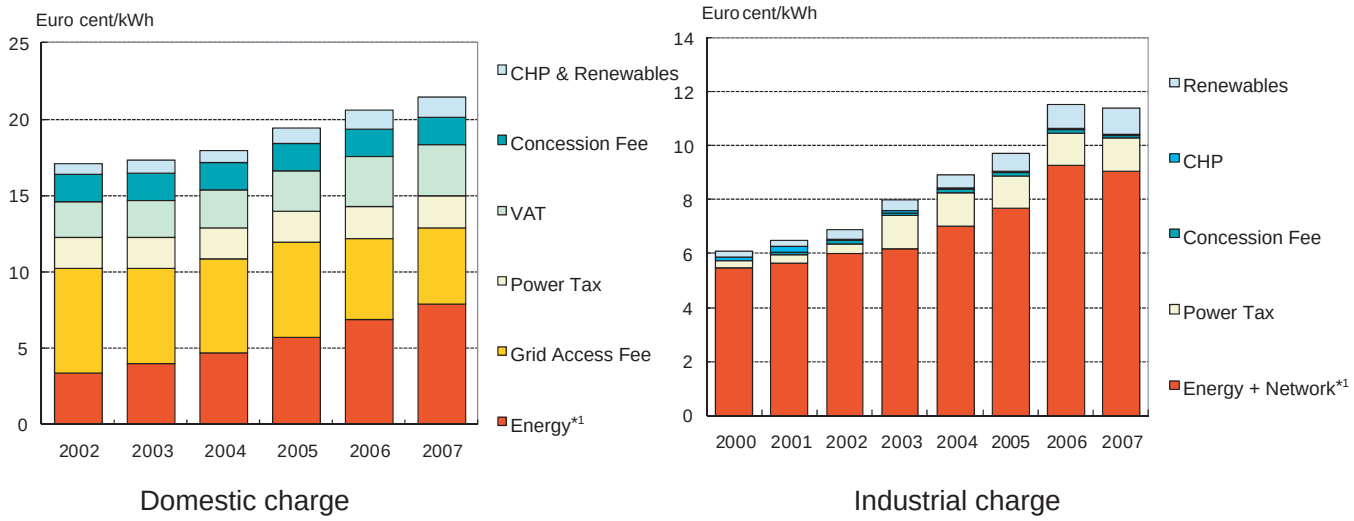
Reference

Tsutsui M. and Hattori T., 2009, “An empirical analysis of electricity retail price changes in Europe – The effects of rising fuel costs and pass-through rates to customers – ” CRIEPI Report Y08041 (in Japanese)



*1: Including other cost

Source: CRIEPI creates figures based on "E.ON Strategy & Key Figures"

Fig.1 Electricity price components in E.ON, Germany

Tab.1 Marginal influence of fuel cost increase (%)

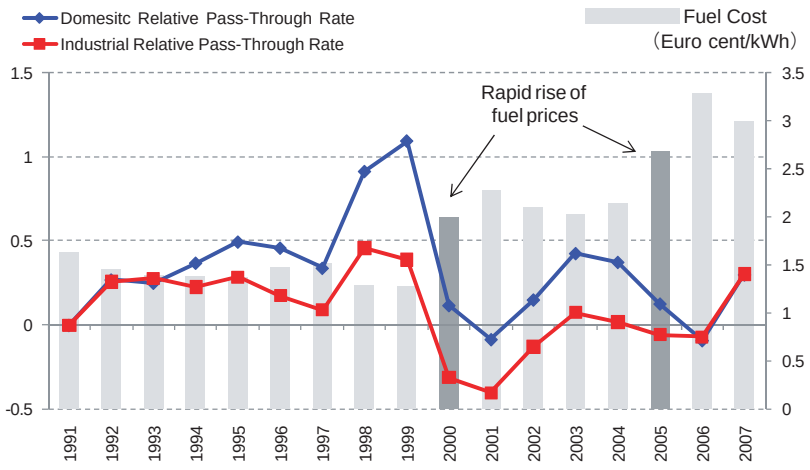
Domestic

Common Factor		0.235 *
Marginal Effect	Share of Nuclear Power	-0.002
	Share of Hydraulic Power	-0.011 *
	Share of Renewable Power	0.030 *
	Fuel Stock	-0.0001 *
	Energy Self-Sufficiency	-0.0002
	Liberalization	0.034 *

Industrial

Common Factor		0.517 *
Marginal Effect	Share of Nuclear Power	-0.006 *
	Share of Hydraulic Power	-0.006 *
	Share of Renewable Power	0.012
	Fuel Stock	-0.0002 *
	Energy Self-Sufficiency	-0.001
	Liberalization	-0.014

* "Common factor" indicates the base effect of 14 countries for 17 years. "Marginal Effect" indicates the effect of marginal increase of fuel cost when each factor increases by 1%, which is added to the common factor depending on the volume of each factor.
* Parts shaded by orange and light blue indicate positive and negative effects in 10% significant level, respectively.



* Pass-through rate (left axis) is relative value estimated base on 1991=0.

Fig.2 Trend of average relative pass-through rate