Basic Technology Subjects

Socio-Economic Research Center

Brief Overview

Integrating academic expertise in economics, risk management, legal studies, energy system analyses, and environmental sciences, the Socio-Economic Research Center develops viable options for sound management of electric utilities and energy/environmental policies in an effort to tackle the challenges of the industry.

Achievements by Research Theme

Utility Management and Policy

Aiming at revealing desirable institutional designs for electric utility industry beyond the ongoing utility reforms, the team attempts to develop analytic methodologies and presents implications in terms of management strategies, future growth opportunities as well as resources required for those changes.

- After the liberalization of electricity industry in Europe, considerable number of energy companies have established a trading division or subsidiary (referred to as "TRD"). Since such organizational structures do not exist until now in traditional electric utilities in Japan, we figured out actual roles and aims of existing TRDs through the interview survey to TRDs, and thereby examined conditions for effectively functioning of TRD if Japanese energy companies apply it (Fig. 1). (Y13004).
- Through a review of continuous social surveys on energy and environmental issues conducted in Japan from 1988 to 2013, we revealed trends of public opinion, such as awareness of the safety and necessity of nuclear power had increased, due to the growing interest in global warming over 10 years from around 2000, which then reversed suddenly as the Fukushima Daiichi nuclear disaster occur.

Economic and Social Systems

The team focuses on obtaining a clear understanding of how government actions affect Japan's economy, especially energy and electricity demand, by collecting and analyzing information on changes in policies, economic trends and energy markets.

- We analyzed the impact of North American energy demand and supply changes in 2020, immediately after commencing LNG export from North America. Contrary to the widely prevalent expectation that the export will lower Japan's average import price of LNG by at least 10%, the result showed that the impact on price is less than half of that expected, in the case that the energy conservation in the US does not advance significantly or their natural gas production stagnates. (Y13023)
- We forecasted Japan's economy and electricity demand using CRIEPI's short-run macro-econometric model (CRIEPI-SMMQ). According to the latest forecast, real GDP growth in fiscal 2014 will slow to +0.6% mainly due to sluggish demand after the consumption tax hike. Based on the above economic condition, the growth of electricity demand is forecasted to be +0.3% in 2014. (Y13001) In addition, using our input-output models, we analyzed the impact of a 10% increase in oil prices on production activities by industry (Fig. 2). The result shows that relatively large negative impact occurs in energy-intensive industries such as petroleum products (producer price: +5.5%, production: -2.4%), and non-ferrous metal refineries (producer price: +4.0%, production: -1.9%). (Y13027)

Energy Technology Assessment

While rebuilding a new set of methodology of energy technology assessment in the new era after the Great East-Japan Earthquake, the team strives to support reliable electricity supply in a sustainable manner, with a special emphasis on nuclear power at this time.

- In order to clarify practical actions to be taken by nuclear operators as well as regulatory authority based on the guidance by International Atomic Energy Agency (IAEA) relating to 'Nuclear Security Culture', we showed concrete images of nuclear security measures which should be taken in Japan through a thorough review of the implementing guide of Nuclear Security Culture published by IAEA, supplemented with an analysis of security threats that actually revealed recently. (Y13002).

Achievements by Research Theme

Surveying the case of investigation framework by Nuclear Regulation Authority (NRA) on the shatter zones at the Tsuruga Power Station, we pointed out the procedural inadequacy such as deficiency to effectively reflect associated scientific knowledge to evolve (Fig. 3). Through analyzing such regulatory problems, we proposed regulatory reformations including; a) converting internal consultative experts committees appointed by the NRA into a statutory council or a special purpose committee under the act, and b) substantializing institutional separation of risk assessment from risk management in NRA. (Y13024).

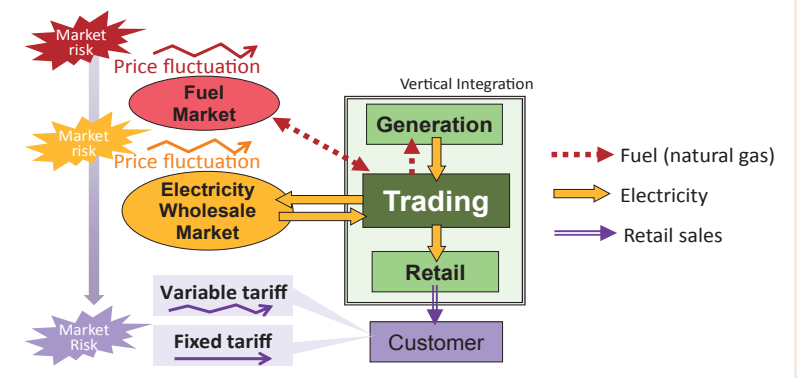

Fig. 1: A TRD model of notable energy Companies in Europe

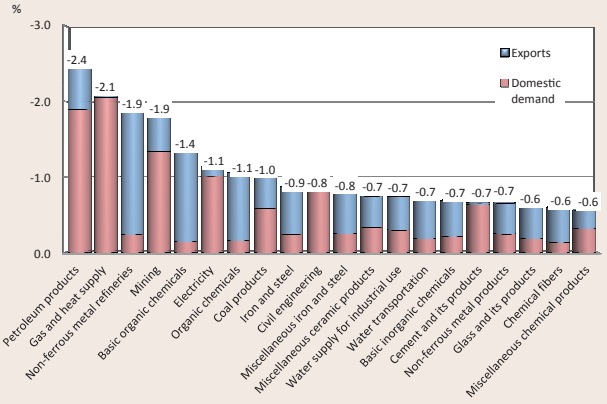

Fig. 2: Influence of soaring fuel prices on production activities by industry -- Top 20 industries

Using our input-output models, we estimated an influence on production in the case of a 10% increase in crude oil price and 7% increase in LNG price. The vertical axis shows the rate at which production would decrease, and the details of the bar chart indicate the contribution. Relatively large negative impact is observed in energy-intensive industries, e.g. petroleum products (-2.4%), gas and heat supply (-2.1%) and non-ferrous metal refineries (-1.9%).

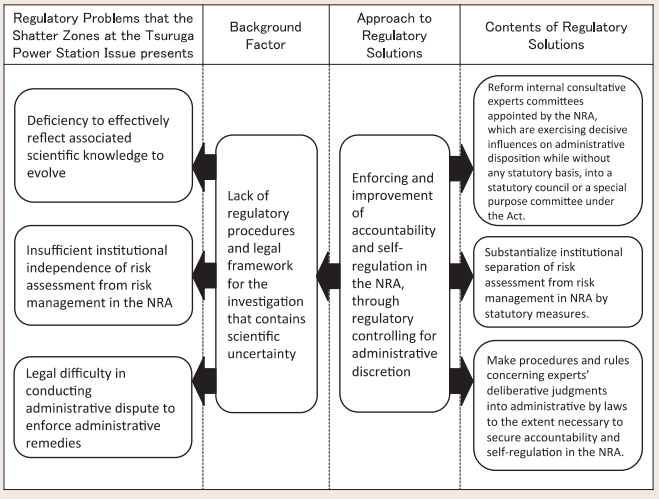

Fig. 3: Regulatory Problems that the Shatter Zones at the Tsuruga Power Station Issue presents and Regulatory Solutions