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OUTLOOK OF THE JAPANESE ECONOMY AND ENERGY SUPPLY-DEMAND STRUCTURE TOWARD 2030

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Overview

Japan's Strategic Energy Plan, released in April 2014, summarizes the country's comprehensive and systematic energy policies, but does not present a quantitative outlook for the future energy supply mix. An outlook for energy demand is essential for informed debate about the future energy supply structure. In this paper, we seek to present an outlook of Japan's economic, industrial, and energy supply-demand structure toward 2030. We further simulate economic impacts on changes in the economic situation and energy supply structure.

Methods

In this paper, we use three models. First, a macro-econometric model is used to forecast the Japanese economy. Second, an input-output model is applied to calculate the industrial output. Finally, an energy supply and demand model is used to estimate energy demand consistent with the resulting economic and industrial structure. These models share key variables, like real GDP, to obtain the consistent results.

Results

In the reference case, the average annual growth rate of real GDP toward 2030 is 1.1%. The resulting annual growth in total electricity demand is 0.4% from 2010 to 2030, and CO2 emissions in 2030 increase by 4% compared with 1990. In the two alternative cases of (i) a weak overseas economy and a strong yen, and (ii) a strong overseas economy and a weak yen, the average annual growth rate of real GDP is 0.5% in the former and 1.6% in the latter. Such changes in the rate of economic growth cause the annual growth rate of industrial electricity demand to -0.9% in the former case and to 0.3% in the latter case.

Conclusions

Different possible paths for the domestic and international economic situation will result in significant variations in energy demand. We are now revising the model and database to obtain updated results of simulation analyses, which will inform debate about the policies needed to ensure Japan has a robust and flexible energy system to meet its different possible economic futures.