

GLOBAL CLIMATE CHANGE AND RENEWABLE ENERGY

Shinsuke HAYASHI

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IPCC third report published in October 2001, mentioned that the CO₂ concentration in the atmosphere has increased up to 371ppm by the human use of fossil fuel after industrial revolution. The anthropogenic CO₂ emission causes the global climate change by disturbing a thermal radiation balance of the earth. The average temperature has increased by 0.6 °C for the last 100 years and drastic climate changes is predicted in this report¹⁾.

Energy supply by fossil fuel consists of a part of anthropogenic CO₂ emissions, therefore realization of energy supply system without fossil fuel is necessary to stop global climate change. The reduction of 6% emission level in 1990 was imposed on Japan in the Kyoto Protocol. From the analysis of the emission trends in the last 10 years, it is clear that a potential of renewable energy to reduce CO₂ emission has not been adequately incorporated in the Japanese environmental policy to achieve the Kyoto Protocol obligation. In view of solving the climate change, use of renewable energy should be more expanded in order to decrease CO₂ emission from energy supply. In this report, the useful policy to expand renewable energy is discussed based on the lessons from the successful cases.

The wind and solar light power generation of electricity should be used more because these generations have extended drastically in the last decade and have no CO₂ emission in power generating process. In the advanced areas, a total capacity of wind generation of Germany reached 12Gw at the end of 2002²⁾ and the wind generation supplies in Denmark about 20% of electricity demand³⁾. In these countries, a tax and financial assistance scheme is applied to decrease an electricity generation cost of renewable energy. The spread of wind and solar light generation is caused by the electricity feed law which assures connection to power lines. The establishment of an ambitious goal and the enforcement of consistent policies via discussion between energy supply and CO₂ emission reduction led also to present situation of renewable energy use in Germany and Denmark.

At the end of financial year 2001 a capacity of wind generation reached 312Mk in Japan⁴⁾. The use of renewable energy is still very much behind than in the advanced areas. In this report, it is concluded that the following factors should be necessary to expand the use of renewable energy in Japan. The renewable energy should be considered more important and the bias to nuclear generation should be eliminated by democratizing the process of formulating a national energy plan. In addition, it is necessary to assure the connection to power lines from renewable energy. In this connection, the quota for renewable energy within the current RPS system should be substantially increased. According to the results achieved in Germany and Denmark, it is concluded that the electricity feed law is better to expand the use of renewable energy.

Citations are described in the abstract in Japanese version.