Energy Technology Strategy

Background and Objective

A long term strategy of energy technology development and diffusion based on appropriate policy administration is needed for energy security and the response to global warming. The project aims to propose the effective energy policy that is apt to fall into an ideological argument, for CO_2 mitigation in the long-term and on a large scale.

Main results

1. CO_2 reduction potential in hot water supply of house hold sector

As a result of having analyzed CO_2 reduction potential by substitution to the energy saving type hot water supply device that has economic reduction potential to hold 22% of the CO_2 discharge of the household sector, the reduction potential in both CO_2 discharge and expense rises to 16-20% compared to the present discharge ratio. For more reduction, substitution to electric energy saving type hot water supply device is important (Fig. 1) [Y10011].

2. Energy saving potential in the business sector by "Climate change strategy plan" of Tokyo metropolitan government

We analyzed the cost-effectiveness of energy saving measures carried out in the business sector. The result shows that CO_2 reduction unit price was less than 0 regarding the direct expense (Fig. 2) [Y10025].

3. Information and advice are effective for energy saving / the CO_2 reduction of the business sector

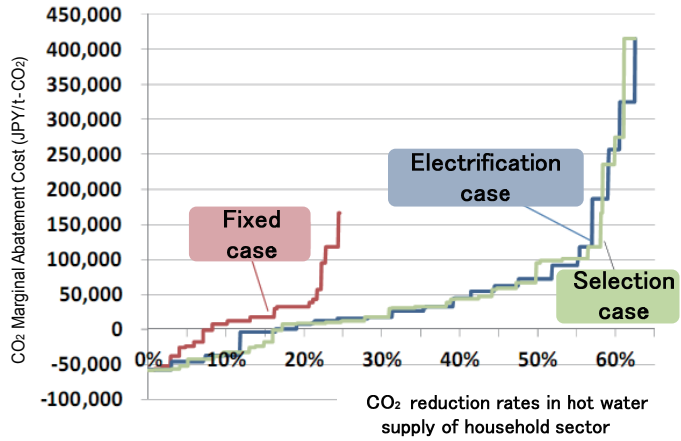
We clarified that close reporting/advice by administration improves the ineffective energy saving of business sector [Y10027]. The measures are effective for energy saving of the pachinko sector which was an example of the service industry [Y10036].

4. Many problems in Tokyo metropolitan emission trading system

Our ex-ante analyses shows that Tokyo metropolitan's ETS started in 2010, and so-called transaction costs will be huge, thus reducing cost-effectiveness of the whole reduction measures [Y10023].

5. Efficient electrification and low carbonization power supply are critical for the large CO_2 reduction on the global scale

We improved world energy model "ES model" to be able to choose electric appliances and calculate minimized costs and effectiveness. We concluded that improvement of the electrification rate and promotion of the low carbon of the power supply are economic measures with large CO_2 reduction (Fig. 3) [Y10009] .On the other hand, Reducing Emissions from Deforestation and Forest Degradation (REDD), in which prevention of discharge by forests decreases deterioration as carbon credit rises, has gathered strength in climate change debate. However, forest owners who should take REDD credit tend not to be settled, and it is difficult to expect them to be a source of supply of credit under the present conditions [Y10039].



Note) Each water heater's efficiency and pricing are based on brochures and reference materials. The analysis assumes three cases: (1)"Fixed case", substitute energy-efficient water heater of the same energy source, (2)"Electrification case", substitute electric energy-saving devices, and (3)"Selective case", can select any of the alternative options in both cases.

Fig. 1 CO_2 marginal abatement cost curve of water heater supply devices in three cases

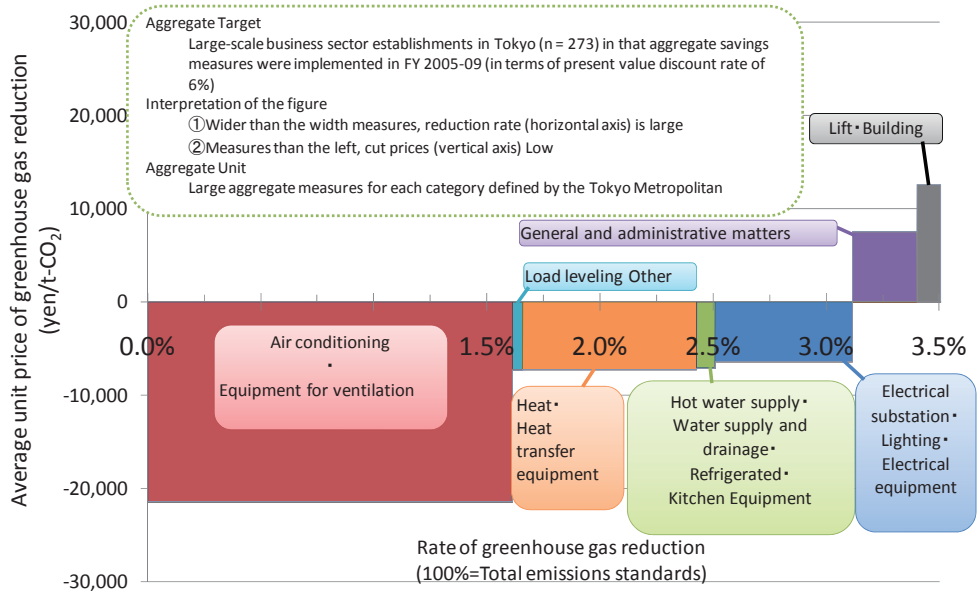
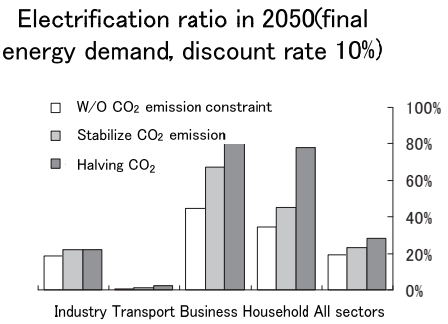


Fig. 2 CO_2 marginal abatement cost curve for energy-saving measures were implemented in large-scale business institutions over the past five years in Tokyo Metropolitan Area

Note) The aggregate of 2,000 energy-saving measures, economic efficiency (vertical axis) against the order of superior effectiveness (horizontal axis) pile of.
Negative more than half the unit price reduction measures. In large measure the effect of heat transfer equipment and heat ventilation air conditioning equipment.

(a)



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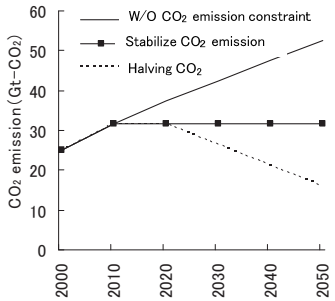

Fig. 3 (a) Emission pathways were examined in this paper
(b) Electrification ratio in each sector final energy demand in 2050 and the route of elimination

(Percentage of final energy demand of electricity accounted for).
Setting the standard for the cost of the electrification rate in the residential sector to improve the business sector, electrification of the transportation sector is much progress. This suggests the importance of reducing the cost of electric vehicles.