Climate Change
Industry Approach
- Technology Base Solution -

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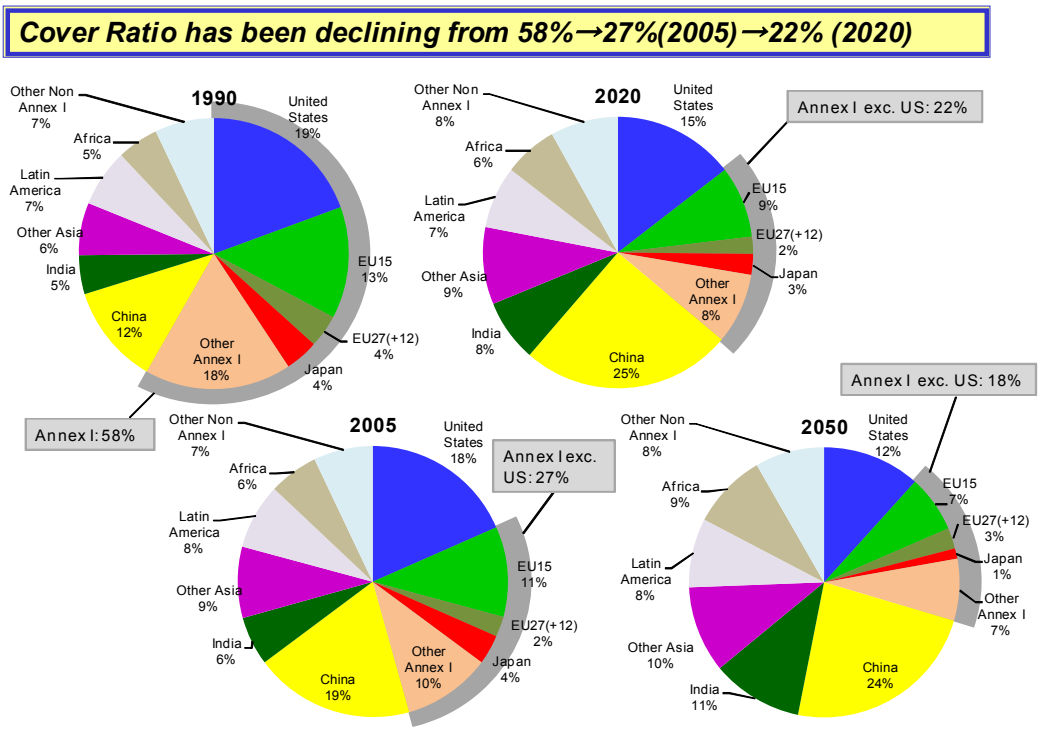
Abstract

Under Kyoto Protocol, CDM(Clean Dvelopment Mechanism), which promote the transfer of green technologies from developed countries to developing countries, was developed and has been implemented. However, the development of CDM projects are not proliferated among developing countries and strongly segregated to HFC and N2O projects. A Major mitigation potential exists in energy saving areas in developing countries where strong economic growth is expected, but energy saving projects have not been mostly accepted under CDM. Also, there are various barriers for the diffusion and adoption of energy saving technologies among developing world. The Bilateral Mechanism promoted by Japan is the framework to overcome those issues and pragmatically accelerate the diffusion of best available energy saving technologies. But halving world CO2 emission by 2050 cannot be achieved by only such energy efficiency improvement with existing technologies. The development of Breakthrough technology is necessary for the long-term solution.

1. Limit of Kyoto Protocol Scheme

Kyoto Protocol uses 1990 as the base year, when developed (Annex 1) countries had 58% share of global GHG emission. However, the share of Annex 1 countries has declined to as little as 27% by 2005, partly because BRICS countries have grown rapidly and partly because US has been dropped out from Annex 1. This trend will continue and the share of Annex 1 will further decline to 22% by 2020. Under Kyoto Protocol, only Annex 1 countries are subject to legally binding mitigation targets, thus the scheme does not effectively pin down the global scale emission reduction.

On the other hands, Copenhagen Accord and its reflection to UNFCCC process; Cancun Agreement, has gathered as much as 140 countries' voluntary commitments, which covers 85 % of global emission. Unlike Kyoto Protocol, those voluntary commitments are not legally binding and no penalty associated with them, but those can become the base for, and will be the only pragmatic solution for the global base solution, which is necessary to solve the global warming problem.



Historical and future potential greenhouse gas emissions by region (Source: RITE, 2011)

Fig.1 Share of GHG emission among major countries

Under Kyoto Protocol, Clean Development Mechanism (CDM) was introduced as a tool to promote mitigation projects in non-Annex 1 countries. This is also the mechanism, which was expected to function as an incentive for green technology transfer from Annex 1 countries to various Non-Annex 1 countries.

However, in the real world, most of CDM projects were developed in China and more than half of the projects were HFC projects. Thus, contrary to the expectation, CDM has not yet been applied globally and only 5% of CDM projects are for energy efficiency improvement projects.

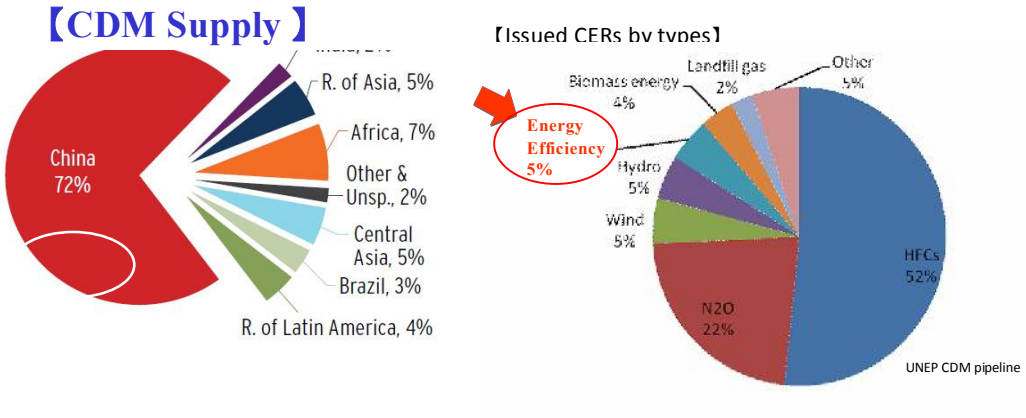


Fig.2 CDM Supply: Host Countries and Project Types

As a result, transfer of energy-saving technologies has not been actually promoted by CDM. In case of steel industry, many energy saving projects were applied for CDM, but the application process took more than two years, and many projects were rejected. Only 1 project actually generate CDM Credit among 60 proposed projects, as shown in Table 1.

Table 1 CDM Application Record of major Steel Energy Saving Technologies; TRT and CDQ

Process	Applid	Registered	Rejected	Credit Issued
TRT	19	1 Took 2 yrs	6	0
CDQ	41	13 Took 2 yrs	2	1

As of January 2010, UN Data

This is because UN process requires too strict "additionality" tests. A CDM project must be feasible only when CDM Credits support it. In other words, economically feasible energy saving projects are not eligible for CDM.

However, energy saving technologies are one of the major potential contributors to the global GHG mitigation. If compared among major countries, Japan has achieved the top level energy efficiency in various industrial sectors. If other nations follow the same efficiency level by technology transfer and best practice transfer, the amount of energy savings and associated CO2 savings would be tremendous.

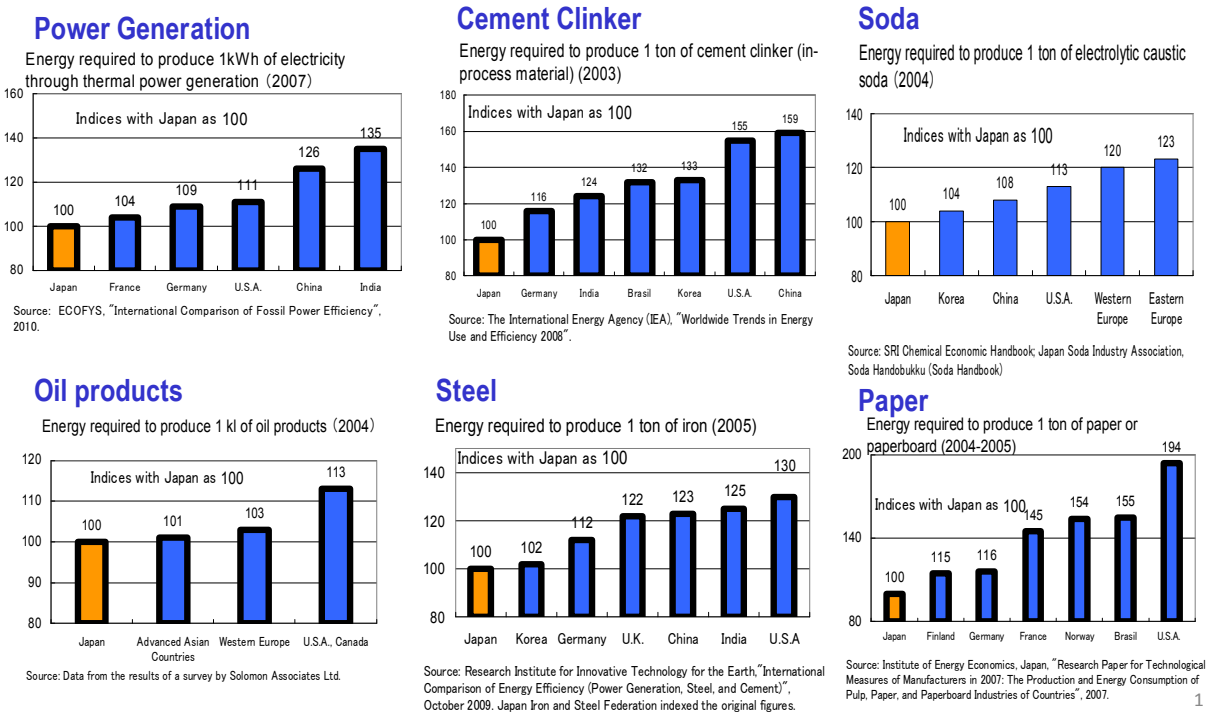


Fig.3 Energy Efficiency Comparison in various Industry Sectors

2. Diffusion of Energy Saving Technology

Energy saving technologies have big potential for global CO2 mitigation. If such technologies are economically feasible as those have been rejected under CDM, the diffusion of such technologies must be automatic and no additional incentive should be necessary. However, this is not the case in reality. This is evidenced in Fig.3 shows big gaps in energy efficiency among countries.

The Steel Taskforce at Asia Pacific Policy Partnership for Clean Energy and Environment (APP) conducted an analysis on the barrier for diffusion of energy saving technologies for steel industry among member countries. The finding is that, even though the major energy saving technologies are positive return investments, the ratio of return (ROI) is not as much as other investment opportunities such as production expansions, so the resources are not necessarily allocated to energy saving investments. Inadequate information about the technologies and perception for them as uneconomic also block the penetration of energy saving technologies.

Therefore, a new accelerating mechanism is necessary to be developed to materialize the CO2 mitigation by the diffusion of energy saving technologies. The new mechanism should not be replacing CDM, but complementary to it, because it covers the areas where CDM has not been effective and actually achieved so little. Bilateral Mechanism promoted by Japan is one example of such mechanism. Under this mechanism, Japan will enter into a bilateral agreement with a host country (mainly Non-Annex 1 country) and provide incentives for the transfer of Japan's energy saving technologies as well as support NAMAs of the country. Japan will, in return, use the CO2 reduction achieved by the mechanism for Japan's national reduction target.

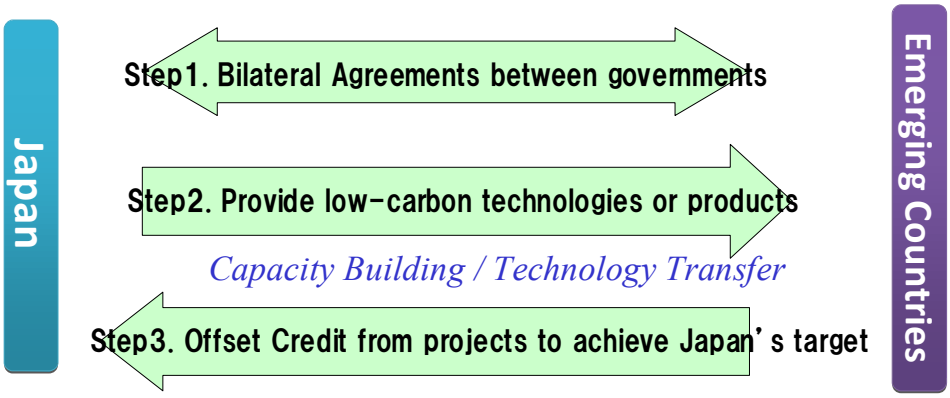
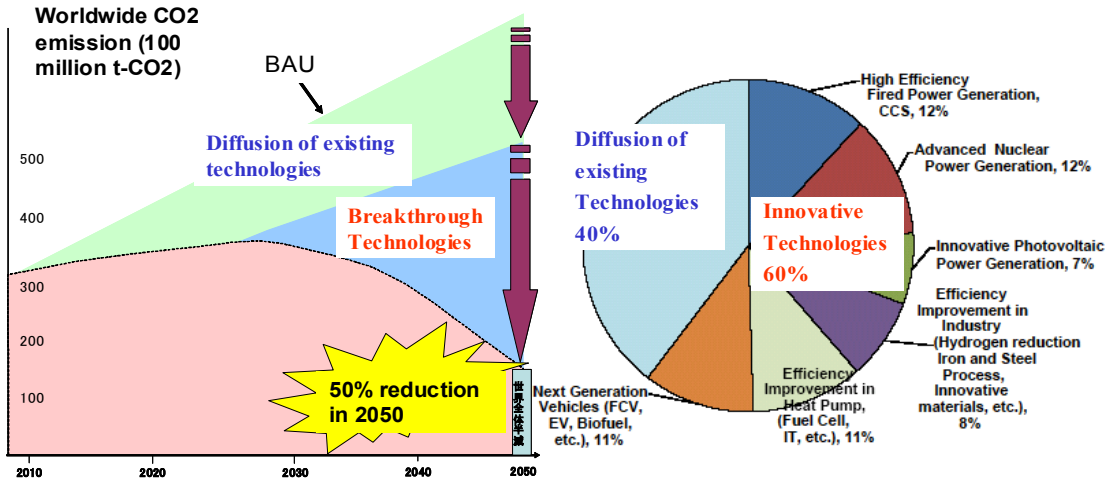


Fig.4 Bilateral Mechanism Scheme

3. Breakthrough Technology Development

According to the calculation by Ministry of Economy Trade and Industry of Japan, the diffusion of currently available energy saving technologies can achieve as much as 40% of total GHG mitigation, which is necessary to achieve 50% emission reduction of GHG by 2050. But the rest 60% must be realized by introducing innovative technologies, which are not yet exist. Therefore, Radically New Breakthrough Technologies must be developed to achieve the long-term goal of halving GHG emission by 2050.



Ministry of Economy Trade and Industry,
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This is very much in line with the assertion of the Hartwell Paper, which was published from LSE and Oxford Univ. in May 2010. Since most of the expected breakthrough technologies are related to power and other major industrial sectors, industries will be the key players for Research, Development, Diffusion and Deployment of technologies. The role of industry is, therefore, very important for both technology transfer and technology development.

References

"The Hartwell Paper, A new Direction for climate policy after crash of 2009", (May 2010), London School of Economics / Oxford University