

Current Status on Promotion of Greenhouse Gas Reductions in Chinese Taipei

I. Background

Most economies in the world previously holding a more conservative attitude toward greenhouse gases reduction have gradually recognized that they have to face the influences and impacts brought by Kyoto Protocol. Chinese Taipei is not a party to the United Nations Framework Convention on Climate Change. However, as a member of the international community, Chinese Taipei has to observe the principles elaborated in the Convention and share the related responsibilities so as to achieve goals of greenhouse gases reduction and maintain its economic growth and industrial competitiveness. Based on the above described, National Energy Conference has been convened three times in Chinese Taipei since 1998. In the Conference, the representatives from different fields worked for solving the problems arising from domestic and international changes in political and economical environment. The results derived from the above conferences have been used as reference for the government's implementation of carbon reduction policies and the standards and regulations in connection with greenhouse gases reduction have been established. Based on such standards and regulations, the Industrial Development Bureau (IDB) started drafting measures and promoting works regarding greenhouse gases control and guidance in order to make the industrial sector adapt to greenhouse gases reduction and energy saving.

For becoming a society featuring energy saving and carbon reduction, Chinese Taipei adopted "Framework of Sustainable Energy Policy" in June 2008. In September 2008, the "Action Plan on Energy Saving and Carbon Reduction" was proposed. This plan covers several aspects such as energy, industry, transportation, environment and life in accordance with the "Framework of Sustainable Energy Policy". The Industrial Development Bureau has positively proposed concrete measures for energy saving and carbon reduction for the industrial sector to take. The "Energy Saving and Carbon Reduction Service Team for the Manufacturing Industry" was also established in order to promote industrial greenhouse gases reduction. It is hoped that the impacts brought by greenhouse gases reduction on the industrial supply chain may be mitigated while maintaining competitiveness.

II. Industrial Greenhouse Gases Reduction Policy

So far, the most controversial issue regarding greenhouse gases is to appropriately establish the objectives and schedule for greenhouse gases reduction at a national level. Greenhouse effect is a long term problem which involves both economy and environmental protection. Therefore, it's not proper to solve a long-term problem by only focusing on short-term ones. Meanwhile, the balance between short-term and long-term needs should be taken into consideration while establishing an energy strategy. Particularly, several key factors including potential, technology and speed exhibited in the industrial structure and energy structure should be adjusted. Currently, the objectives for GHG emission reduction established by the authorities are based on the following documents:

1. The "White Paper on Environmental Policy": "plan and promote for CO₂ emission reduction at a national level before any consensus reached via international negotiations".
2. "Framework of Sustainable Energy Policy" promulgated by Chinese Taipei on June 10, 2008: by implementing "clean energy" at the supply side and "energy saving" at the

demand side, the industrial structure will be adjusted for achieving high added values and low energy consumption. Additionally, it is hoped that the carbon emission density per unit output value will decrease by at least 30% by 2025.

3. “Framework of Sustainable Energy Policy – Action Plan for Energy Saving and Carbon Reduction” approved on September 11, 2008: encourage the manufacturing industry to achieve energy saving and carbon reduction.

III. Current Guidance for Industrial Greenhouse Gases Reduction

The Industrial Development Bureau of MOEA has started guiding the manufacturing industry for establishing its ability in GHG emission control and reduction since 2005. The Bureau tries to fulfill the requirements for GHG reduction and enable the industry to gradually confront the challenges brought by the GHG issues. Therefore, by following the principles of Non-Regret Policy, the Bureau has been assisting the industry in improving energy efficiency, voluntary reduction and the abilities in inventory and verification mechanism for GHG emission control. In the meantime, the Bureau has been speeding up facility replacements and developing the green industry featuring energy saving and resource-recycling via guiding with clean production and low carbon technology. The major guidance works are described as follows:

1. Guidance for GHG inventory, verification and registration

The developed economies have respectively been making and implementing GHG reduction policies in order to fulfill their commitments to GHG reduction objectives. Among those policies, the plans for GHG inventory and reduction are more acceptable at a project level than at a national level such as general emission control, imposition of carbon tax, etc. The economies such as Japan, Korea, UK, USA, etc. have established their national inventory and registration mechanisms. Therefore, GHG inventory and registration have already become the primary policy and technical tools for implementing early greenhouse gases reduction.

In 2005, the Bureau started guiding those big energy subscribers in the manufacturing sector by introducing GHG inventory, verification and registration. By following the international standards, including the calculation guidelines specified in IPCC (Intergovernmental Panel on Climate Change) and ISO/CNS 14064-1, the establishment of inventory methods, technologies and software were completed. By 2008, the Bureau had completed its guidance with GHG inventory for 121 out of the top 350 energy subscribers and emission verification and registration for 115. By working with reduction project via low carbon technology, the Bureau will have completed guidance with GHG inventory for 260 big energy subscribers by the end of 2009. The GHG inventory guidance aims at helping manufacturers establish their own abilities in GHG control and recognize their potential in emission reduction so as to fulfill the follow-up reduction works.

As to GHG registration, domestic manufacturing sector is required to register its greenhouse gas emissions on the “Industrial Greenhouse Gases Information Center” established by the Bureau. An average of more than 200 manufacturers registered their emissions from 2005 to 2007. The total emissions each year reached more than 81,000,000 metric tons of CO₂e. Based on the registered data from the information center, the Bureau is able to calculate and control the conditions concerning industrial GHG emissions. Such data will also be used as reference for the planning of emission quotas.

2. Voluntary agreement on greenhouse gases reduction

The Bureau has long been engaged in assisting the industrial sector in energy saving

and measures facilitating production efficiency. Therefore, MOEA and industrial associations (including steel & iron, petrochemical, cement, paper, man-made fiber, and textile printing and dyeing) signed a voluntary agreement of CO₂ emission reduction in 2005. The 6 industrial associations committed themselves in the voluntary agreement to saving energy by 1,390,000 KLOE, or 4,020,000 metric tons of CO₂e, from 2004 to 2008. As to the GHG containing fluorine (PFCs, HFCs and SF₆) at high potential emitted by the electronic industry, MOEA, TSIA (Chinese Taipei Semiconductor Industry Association) and TTLA (Chinese Taipei TFT LCD Association) signed a voluntary agreement in March 2007, in which TSIA and TTLA committed that the reduction of GHG containing fluorine would amount to 24,000,000 metric tons of CO₂e in 2006~2010. The manufacturers which are parties to the above agreement are large-scale enterprises. Consequently, their commitment to emission reduction will be a great contribution to domestic GHG reduction if the related objectives can be achieved.

In 2006, the Bureau provided technical consultation and methods for calculating carbon reduction to the manufacturers signing the voluntary agreement in order to promote voluntary reduction. The 6 industrial associations promoted a total of 1,298 emission reduction measures from 2004 to 2007. The total reduction amounted to 3,806,000 metric tons of CO₂e during the above period. Manufacturing process (accounted for 47%) was the most popular measure taken for carbon reduction. The reduction measures are shown in Figure 1. One of the most popular methods for reduction applied was improvement of facilities (accounted for 34%). The statistics regarding reduction methods is shown in Figure 2. In addition, TSIA and TTLA carried out GHG reduction containing fluorine by 1,671,000 metric tons of CO₂e in 2006~2007. The reduction results of TSIA and TTLA were obtained from the third-party's external verification conducted by an international organization. Therefore, the results can be used as reference while the industrial sector takes part in related international emission reduction mechanisms in the future.

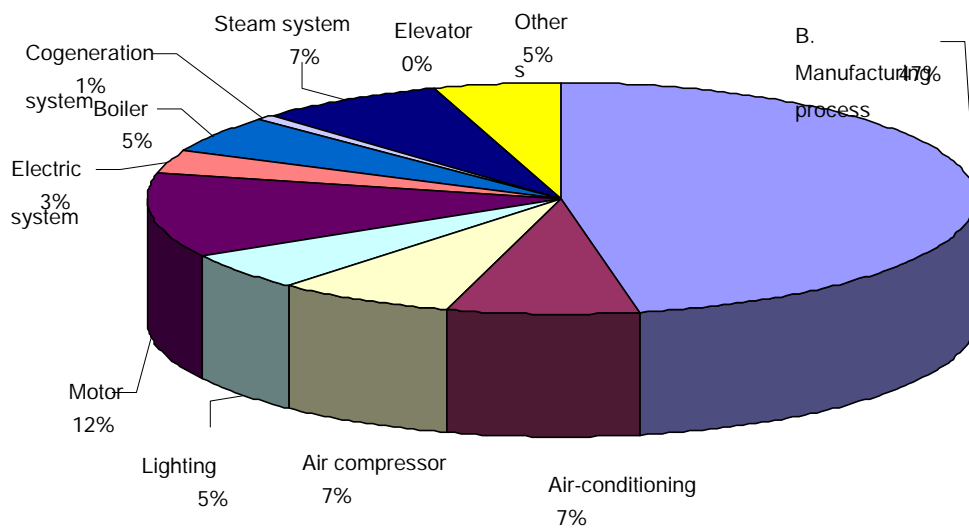


Figure 1. Voluntary reduction measures taken by the six major industries

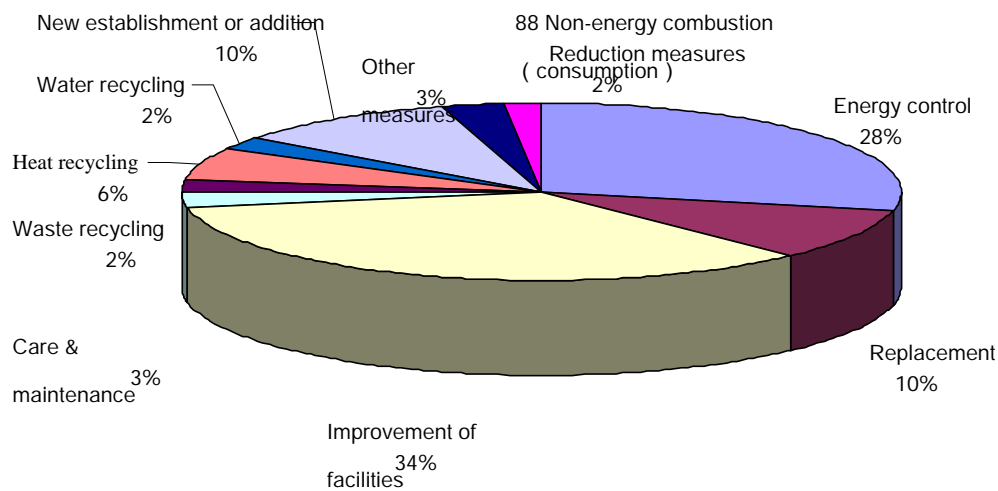


Figure 2. Voluntary reduction methods applied by the six major industries

3. Promotion of Carbon Disclosure Project in the Manufacturing Industry

The negotiations over GHG control have come from a higher national and regional level to lower levels via industrial supply chain. Such trend directly influences operational models and orders the enterprises have. 385 investment legal persons worldwide conducted surveys on globally famous large-scale enterprises via Carbon Disclosure Project (CDP) for evaluating the climate-change related risks and opportunities encountered by enterprises. In this Project, enterprises were required to disclose current conditions and strategies in connection with GHG emission. In 2008, a total of 1,550 enterprises replied questions listed in Carbon Disclosure Project, which showed that the enterprises were paying more attention to disclosing the information of carbon emission.

In 2005, the Bureau started its guidance with GHG inventory for domestic manufacturers. By 2008, 121 manufacturers had received inventory guidance and 115 manufacturers had received verification and registration guidance. The Bureau also established the “Industrial Greenhouse Gases Information Center” to guide and encourage the industry to register GHG emissions. The annual volume registered has reached more than 81,000,000 metric tons of CO₂e. With the guidance mechanism established by the Bureau and the efforts made by the enterprises, Chinese Taipei was invited to take part in CDP survey in 2008. 14 Chinese Taipei’s enterprises replied the survey, ranking the 2nd place after Japan in Asia. Such result showed the efforts made by enterprises in disclosing carbon emissions and gained attention from international organizations.

Additionally, the CDP organization will investigate the contents disclosed. As a result, the survey aimed at large-scale enterprises is now expanding to the supply chain system possessed by them. In 2007, the Supply Chain Leadership Collaboration (SCLC) was established. It requires the enterprises to positively trace and control the information of carbon emissions from their suppliers. In the future, various types of suppliers or manufacturers will not be able to avoid from disclosing carbon emissions.

The Bureau realized that the international requirements of disclosing carbon information might cause stress to our enterprises and create impacts on our industrial development. Therefore, the Bureau has set out promoting a carbon disclosure project. For the electronic industry which may be influenced by international trade to a wider extent, “Electronic Industry Carbon Supply Chain Collaboration” was established first. By

combining the efforts made by the industrial associations and operators, a carbon footprint disclosure project was jointly promoted. In addition to guiding with GHG inventory and registration, the Bureau has also introduced the existing models for calculating product carbon footprint. The domestic manufacturers have to learn how to calculate GHG emissions during a product lifecycle and to fulfill the strict international requirements for disclosing carbon emissions.

4. IDB Guidance for Greenhouse Gases Reduction Project

The experience derived from the international community shows that the industrial sector may encounter some difficulties after promoting voluntary gas reduction for a period of time. The reduction effects will gradually mitigate instead of continuous expansion. It requires the government's participation at this moment. Since 2008, the Bureau has been facilitating the industrial sector to implement greenhouse gases reduction project which meets ISO 14046 standards via integrating and applying low carbon technologies. Meanwhile, the industrial sector is financially subsidized and further encouraged to establish clean production and accelerate facility replacement. Thus, the industrial sector may continue promoting gas reduction and further move forward to industrial upgrading and transformation. The Bureau helps the industrial sector implement third-party's verification on GHG emissions at an organizational level and validation on GHG reduction at a project level in accordance with the international standards and criteria (ISO14064-1 and ISO14064-2). After the reduction effect (capacity) is approved via external verification conducted by a competent organization, the quality and accuracy of reduction results can be accredited and kept up with the international community.

The guidance and subsidies offered by the Bureau are covered in two types of GHG reduction Project Design Documents: "Validation of Greenhouse Gases Reduction Project (project level)" and "Organizational Emission Verification (organizational level)". 11 project design documents (PDD) at a project level with the estimated reduction reaching 607,000 metric tons of CO₂e have been approved so far. As to organizational reduction, 97 manufacturers making an application for subsidy project have been approved. With appropriate guidance and subsidies, the manufacturers are able to obtain third-party's external verification statement on organizational GHG emissions, which shall meet the international criteria.

IV. Technologies and Services of Energy Saving and Carbon Reduction for the Manufacturing Industry

For effectively reducing the manufacturing industry's GHG emissions, enhancing industrial production efficiency and competitiveness, and achieving the objective that "carbon emission density per unit output value from the industrial sector will decrease by 30% by 2025" specified in the "Framework of Sustainable Energy Policy", the Bureau established the "Energy Saving and Carbon Reduction Service Team for the Manufacturing Industry" in October 2008. The service team aims at guiding the manufacturing industry with energy saving, carbon reduction and clean production in addition to promoting voluntary GHG reduction. With the above efforts, the manufacturing industry will achieve a decrease of 8% in GHG emission density by 2012 so as to mitigate the impacts possibly caused to the industrial supply chain.

The service team may assign specialists or experts to station at a factory. They will assist such factory with the systems or items such as manufacturing process, heat energy, electricity, cooling, air-conditioning, lighting, waste recycling and energy regeneration and reuse by offering consultation, interview, diagnosis, demonstration of engineering

improvement as well as extensive guidance. Based on the above, this service team is established for offering comprehensive technologies and services for energy saving and carbon reduction. The service team will be able to provide in-factory guidance for more than 2,000 manufacturers and consultation services for more than 5,000 manufacturers starting from April 2009. The above guidance and services will help the manufacturing industry achieve energy saving by 320,000 KLOE and GHG reduction by more than 1.2 million metric tons of CO₂e. The cost saving contributed by energy saving from the manufacturing industry is estimated to reach NTD 4 billion. The cost-saving fact will indirectly facilitate the development of energy-saving facility industry and energy service companies (ESCO).

V. Establishment of the Industrial Sector's Abilities in Greenhouse Gases Reduction and Related Measures

In addition to the above-mentioned guidance measures on greenhouse gases reduction, the Bureau also supports establishing the industrial sector's abilities in implementing greenhouse gases reduction. The works in relating to the above include: industrial structure adjustment and emission reduction planning for the manufacturing industry; information establishment and updating on greenhouse gas emissions; establishment of optimal technology and benchmark data; planning and simulation of carbon emission allowance mechanism; establishment and updating of information supporting system for greenhouse gases decision-making; establishment of regulations, policies and measures in connection with energy saving and carbon reduction; related promotional works; and international exchange. The Bureau will continue promoting and implementing the above described works.

VI. Conclusions

According to the AR4 (the fourth assessment report) published by IPCC in 2007, the following six suggestions were proposed after considering the feasible tools and policies applied to greenhouse gases reduction for the industrial sector: (1) Benchmark Data; (2) Standards; (3) Subsidies; (4) Tax Credits; (5) Tradable Permits; and (6) Voluntary Agreements. Generally speaking, the works in connection with industrial greenhouse gases reduction promoted and implemented by the Industrial Development Bureau in recent years have met the above mentioned suggestions. The fact shows that the Bureau is heading toward the correct directions. The Bureau will continue guiding the industrial sector to establish its abilities in greenhouse gases reduction and to substantially implement carbon reduction. In addition, the Bureau will also help the industrial sector to take the advantage of the opportunities brought by the emerging low carbon economy. Meanwhile, the market mechanism will gradually enable the development of domestic industrial structure heading toward low energy consumption and high added values. Thus, the domestic manufacturing industry will be well equipped to face the trend of global carbon reduction and deal with related economic impacts.

Reference

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