

The Challenges of Emissions Trading within the Context of Taiwan's Greenhouse Gases Reduction Policies

Extended Abstract # 42

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INTRODUCTION

Climate change has been a global concern for more than two decades. Under growing pressure, multilateral environmental agreements have been entered into and implemented to reduce the levels of greenhouse gases (GHGs) in the atmosphere. The Republic of China (Taiwan), though not a member of the UNFCCC, nor a party to the Kyoto Protocol, has endeavored to strike a balance between reducing GHG emissions and maintaining economic development. However, the GHG reduction policy tools initiated by the Taiwan government are somewhat uncertain since the bill for the Greenhouse Gases Reduction Act ("GGRA"), proposed in 2008, is still under legislative review. Among the other aspects of the bill, the emissions trading scheme is included as a long term policy tool. This article will not only report on the updated status of the emissions trading system organized so far by the Environmental Protection Administration (EPA) of Taiwan, but will also comment on the challenges confronted by it. Hopefully, this article could provide insights for developing countries that do not share international GHG reduction obligations and plan to adopt emissions trading as a policy tool.

METHODS

This article will utilize a documentary analysis to report on the updated status of Taiwan's GHG emissions trading system and comment on it based on environmental economics. The comments will focus on the implications of Taiwan's emissions trading strategy, the issues of indefinite reduction targets, the embedded uncertainties, linking with other trading systems unilaterally, and the compatibility between emissions trading and energy taxes. Finally, the article will conclude with suggestions for structuring Taiwan's emissions trading.

RESULTS AND DISCUSSION

GHG Emissions of Taiwan

Taiwan's GHGs emissions in 2008, including CO₂, CH₄, N₂O, hydrofluorocarbons, perfluorocarbons, and SF₆, was 289.8 Mt CO₂ equivalents (land-use change and

forestry uptake excluded), 92.0% of which were energy-related CO₂ emissions. The energy industry sector accounted for 9.0% of the total CO₂ emissions, the industrial sector 48.1%, the transportation sector 13.7%, and the commercial/residential sector 28.0%.¹ In accordance with the International Energy Agency (IEA) data, Taiwan's CO₂ emissions from fuel combustion in 2008 were 264.3 MMt, which ranked globally in the top 22 countries' CO₂ emissions from fuel combustion, and represented an increase of 130.5% from 1990 to 2008.² However, the CO₂ emissions from fuel combustion in 2008 decreased from 2007 levels by 4.3%, which is the first decrease since 1990. An economic recession, increased oil and electricity prices, and energy saving and carbon reduction measures contributed to the decrease of CO₂ emissions during this time period.³

Two Main Approaches to GHG Emissions Trading

Emissions trading (if designed well) can offer a potentially cost-effective means to reduce GHGs without the need for the regulator to collect information about abatement costs.⁴ Cap-and-trade (CAT) and baseline-and-credit (BAC) systems are two main options to implement GHGs emissions trading.⁵ A CAT system sets a total cap, which is an absolute quantity of emissions from regulated sources over a specific period of time. The total cap is allocated, free or by auction, to the regulated sources in the form of a right to emit a specific quantity (allowances). Once the allocation is completed, the regulated sources can trade allowances freely according to their planned emissions. At the end of compliance period, if the actual emissions of a regulated source are higher than the allowances it holds, the source needs to buy allowances and fill the gap. If the regulated source holds an excess of allowances, it can sell these.

Instead of setting a fixed cap, a BAC system usually defines a baseline, the emissions efficiency of which is measured in weight per unit of input, output or activity for the regulated sources. At the end of the compliance period, the regulator compares the emissions calculated by baseline with the actual emissions from the source during the period. If the actual emissions are lower than the emissions calculated by baseline, the regulated source receives credits equal to the difference and the credits can be traded freely. Otherwise, the regulated source must purchase credits equal to its excess emissions. Consequently, the regulated source has to earn credits before it can begin trading.⁶

CAT is attractive to policy-makers and environmental groups because of its certainty on the environmental outcome. On the contrary, BAC is more attractive for the regulated sources since it implies free of charge to emit to the level of baselines and imposes no limitation on the production activities. Moreover, in general, CAT is more cost-effective than BAC.⁷

Implications of Taiwan's Emissions Trading Strategy

In accordance with the first reading of the GGRA, Taiwan will implement emissions trading in three stages. Stage one will require specific industries to report their

emissions inventory mandatorily. Stage two will involve the implementation of a BAC system. Then, depending upon the development of the post-Kyoto Protocol, the EPA is authorized to implement a CAT system as stage three.

Presumably, there are two implications for Taiwan's three-stage strategy. The first is that stage one will be utilized to collect the necessary emissions information to facilitate stages two and three. In fact, Taiwan had implemented voluntary agreements back in 2004 for the energy and industry sectors; however, such agreements were characterized as completely voluntary⁸ and participation was weak because there were neither incentives nor pressures exerted by the government.⁹ EPA announced in 2010 that those voluntary agreements that incorporated GHG reduction since 2004 could retroactively apply for emissions credits for future trading. If the announcement were made in 2004 as an incentive to encourage participation in voluntary agreements, stage one may have been unnecessary.

The second implication is that BAC is utilized primarily as a transitional step in order to lower the fiscal and regulatory impacts on the regulated sources since the BAC admits free emissions to the levels of baselines and imposes no production limits. Ultimately, Taiwan will switch to CAT, but, there is room for further discussion regarding treating BAC as a transition.

First, there is a considerable gap between obtaining emissions information in stage one and converting such information into the benchmark emissions efficiencies for BAC. Achieving the original purpose of reducing fiscal and regulatory impacts by setting appropriate benchmarks for different industries is even more difficult. It might involve complicated negotiations with the industrial sectors or the regulated sources and the information withheld by the industries is against the government to negotiate.

Second, EU ETS set up a CAT system in 2005, which is currently the largest GHG emissions trading system in the world.¹⁰ In accordance with the evolution of global carbon markets during 2005 to 2010, the trading volumes of EU allowances became more pronounced than ever.¹¹ If the EU ETS corrects its system defects found in Phase I and II and operates continuously, CAT has a good chance to become dominant as the model of a global GHG emissions trading system. Ultimately, familiarizing Taiwan's industries with BAC operation during stage two would not help Taiwan's emissions trading system link with the international CAT markets.

Finally, instead of treating BAC as a transitional stage, CAT could be approached stepwise to reduce impacts on the industries and gain political support. Initially, CAT could adopt free allowance allocations based on the historical emissions of sources to make sure that the cap is not too tight. The emissions information collected in stage one could meet the needs of such allocation. Then, the government could gradually switch to auction and tighten the cap, depending upon Taiwan's reduction targets and the timeframe of transitioning into a low carbon economic structure.

Indefinite Reduction Targets of Emissions Trading

Taiwan's government announced "Sustainable Energy Policy Framework" in 2008 and

set a CO₂ reduction target of returning to the 2008 level between 2016 and 2020, with further reduction to its 2000 level by 2025. Two years later, the short term target was modified as returning to the 2005 CO₂ emissions level by 2020. Whether the GGRA should include the national targets raised rigorous contention during the negotiation of first reading, but no consensus was reached. In order to maintain the flexibility to cope with the subsequent development of Kyoto Protocol, the government decided not to include them. However, without clear national targets, it is not known to what extent the emissions trading, as the main policy tool of the GGRA, will contribute.

Embedded Uncertainties

The regulatory certainty of an emissions trading system enables Taiwan's industries to manage carbon emissions costs and make long-term investments¹². The first reading of the GGRA remains unclear about which industries will be included, how to set the baselines for BAC, the overall cap and allocation of allowances for CAT, and the timeframes of each stage. It is expected that the industries will cast doubt on the implementation of emissions trading because of these uncertainties. If the EPA does not clarify these uncertainties in advance, it would significantly increase the political resistance to the GGRA.

Linking with Other Trading Systems Unilaterally

In accordance with the first reading of the GGRA, the credits generated by joint implementation (JI) and clean development mechanism (CDM) projects under the Kyoto protocol and the allowances of foreign trading systems can be used by the regulated sources to fulfill their emissions reduction targets up to 35%. To transit into a low carbon economy, Taiwan needs to encourage its industries to cut CO₂ emissions by themselves instead of buying credits or allowances abroad. Especially, Taiwan does not currently bear any international GHG reduction obligations and will not in the foreseeable future because of Taiwan's particular political status¹³. It does not have to buy allowances abroad in order to meet its international targets. Linking with prevailing trading systems could be a long term strategy. But currently, Taiwan should organize its trading system that is compatible with those prevailing systems. It is more important than unilaterally linking with foreign trading systems.

Compatibility between Emissions Trading and Carbon Taxes

In addition to implementing an emissions trading system, Taiwan's government plans to impose energy taxes related to the carbon content of fossil fuels. It is probably too early to comment on this plan, because the structure of the energy taxes and the time table of taxation are still unknown. Several factors need to be considered before energy taxes are implemented. First of all, in most instances, the added costs incurred by the industries due to emissions trading and carbon taxes will be passed on to end consumers, and will tend to impact the poor more than the rich.¹⁴ It could be complicated for the administration to manage the regressive effects of implementing both CAT and an energy tax at the same time. Second, the European Commission proposed a carbon tax at the EU level in 1990s but failed due to industrial lobbying.

The Organization for Economic Co-operation and Development (OECD) began investigating a uniform carbon tax for all OECD countries but failed to craft any proposal.¹⁵ It would be very complicated for Taiwan to manage the world trading disadvantages if Taiwan imposes carbon taxes before these developed and wealthy countries. Finally, double regulation over particular industries should be avoided so as not to distribute reduction burdens unevenly among the industries and impact their international competitiveness.

SUMMARY

Strategically, Taiwan has made up its mind to adopt emissions trading as its main policy tool to reduce GHGs emissions. However, there are too many uncertainties to expect when the emissions trading will launch and what exactly the system will include. It is quite unusual that Taiwan is willing to voluntarily accept obligations on climate change issues, but will not be able to do so under any multilateral agreements. That is probably the reason why Taiwan is uncertain about emissions trading and is waiting for more international signals of post-Kyoto regulations on the GHGs reduction.

It would be an advantage for Taiwan to implement emissions trading without any international reduction obligations. Taiwan can control its own GHG reduction timescale to link emissions trading with the transition to a low carbon society. National reduction targets needs to be set clearly, either by top-down or bottom-up procedures. Then, the timelines and the amount of GHG emissions reductions required to implement lower carbon technologies and emissions trading could be set. Moreover, the EPA could eliminate the uncertainties embedded in the GGRA accordingly and reduce the political resistance significantly.

The article concludes with suggestions for the structuring Taiwan's emissions trading as follows: (1) the CAT system could follow the stage one (collecting emissions information) immediately; (2) CAT should be implemented in stages in accordance with the schedule of implementing lower carbon technologies, as it would be better to build capacity first to ensure the smooth transition to a lower carbon society; (3) mutual recognition to link with foreign trading systems is needed, and linking with other trading systems could be Taiwan's long term strategy, but probably not immediately after the implementation of CAT; and (4) a carbon tax regime should be compatible with the GHG emissions trading system, and the schedule needs to be planned carefully to avoid serious impacts on consumers as well as exports.

REFERENCES

1. Taiwan EPA webpage, http://unfccc.epa.gov.tw/unfccc/english/04_our_efforts/05_ghg.html (accessed July 2011).
2. International Energy Agency, CO₂ Emissions from Fuel Combustion Highlights (2010 Edition).
3. Taiwan EPA webpage, http://unfccc.epa.gov.tw/unfccc/english/05_faq/

01_faq.html#11 (accessed July 2011).

4. Bernd Hansjürgens, *Introduction*, in *Emissions Trading for Climate Change* (Bernd Hansjürgens ed.), Cambridge University Press: Cambridge 2005, pp. 2-3.
5. Jurgen Leffvere, *The EU Greenhouse Gas Emission Allowance Trading Scheme*, in *Climate Change and Carbon Markets: A Handbook of Emission Reduction Mechanisms* (F. Yamin ed.), Earthscan Publications Ltd.: London, 2005, pp. 86-87.
6. UNEP, et al., *An Emerging Market for the Environment: A Guide to Emissions Trading*, United Nations Publication: Denmark. 2002. pp. 8-9.
7. A. M. Gielen, et al., *Comparing Emission Trading with Absolute and Relative Targets*, paper presented at the 2nd CATEP Workshop on the Design and Integration of National Tradable Permit Schemes for Environmental Protection, hosted by University College London, 25-26 March 2002.
8. Based on the incentives and/or disincentives provided, there are three categories of voluntary agreement programs: 1) that are completely voluntary with no incentives involved, 2) that use the threat of future regulations or emissions taxes as a motivation for participation, and 3) that are implemented in conjunction with existing strict regulations or emissions tax policy. See Lynn Price, *Voluntary Agreements for Energy Efficiency or GHG Emissions Reduction in Industry: An Assessment of Programs Around the World*, Proceedings of the 2005 ACEEE Summer Study on Energy Efficiency in Industry, 2005.
9. There were 180 participants involved and reduction of 4.09 Mt CO₂ contributed between 2004 and 2007, approximately 1 Mt CO₂ per year, which is less than 0.5% of Taiwan annual GHGs emissions. See Taiwan Green Productivity Foundation, *Green Productivity Newsletter*, No. 15, pp. 9.
10. Pew Center on Global Climate Change, *THE EUROPEAN UNION EMISSIONS TRADING SCHEME (EU-ETS) INSIGHTS AND OPPORTUNITIES*, Pew Center on Global Climate Change: Alexandria, VA, 2005.
11. Olga Christyakova, et al., *State and Trends of the Carbon Market 2011*, The World Bank: Washington, DC, 2011, pp. 9.
12. Volker H. Hoffmann, et al., *A Taxonomy for Regulatory Uncertainty- Application of the European Emission Trading Scheme*, ENVIRONMENTAL SCIENCE AND POLICY, Vol. 11, pp.712-722 (2008).
13. Mainland China claims that Taiwan is one of its provinces. Taiwan can not join the UNFCCC, Kyoto Protocol, or any other international agreements because mainland China insists upon “one China policy.”
14. For emissions trading, see National Commission on Energy Policy, *Allocating Allowances in A Greenhouse Gas Trading System*, National Commission on Energy Policy: Washington, DC, 2007, pp. 12. For carbon tax, see Stefan Speck,

Energy and Carbon Taxes and Their Distributional Implications, ENERGY POLICY Vol. 27, pp. 659-667 (1999).

15. Christina K. Harper, *Climate Change and Tax Policy*, BOSTON COLLEGE INTERNATIONAL AND COMPARATIVE LAW REVIEW Vol. 30, pp. 411-460 (2007).

KEYWORDS

Baseline-and-Credit (BAC) System, Cap-and-Trade (CAT) System, Carbon Taxes, Emissions Trading, Greenhouse Gases (GHGs), Kyoto Protocol, UNFCCC