Climate Policy Framework to Reduce Greenhouse Gas Emission in Energy and Transportation in Vietnam

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Abstract

Since renovation in 1986, Vietnam has achieved remarkable economic development but from sustainable approach it has also been facing climate change impacts such as increasing disaster hazards, sea-level and temperature rise, etc. One of the main causes for these negative effects is the large number of transportation vehicles resulting in rapidly increasing Greenhouse Gas Emission (GHG) especially in big cities. To reduce GHG in energy and transportation in particular and in all sectors in general, the Vietnamese government is making a climate policy framework. Under Kyoto Protocol, Vietnam has no responsibility to reduce GHG emission, therefore, only few provisions in Law on Environmental Protection 2005 regulates GHG emissions. In addition, there are also other legal measures which indirectly support GHG emission reduction such as legal provisions in environmental protection sectors, on environmental impact assessment and other regulations for specific related sectors. This paper appraises the climate policy framework applied in Vietnam in the aim to reduce GHG emission in energy and transportation sector. Moreover, it analyzes effects of this legal framework and addresses challenges as well as recommendations for Vietnam to sustain it and achieve the objective of GHG emission mitigation.

Keywords: GHG emission, energy and transportation, climate policy framework in Vietnam, sustainable approach, environmental protection.

1. Introduction

Climate change has become one of the critical issues in many developing countries such as Vietnam. From sustainable point of view, a number of related issues have currently been addressed, for instance, global warming, sea level rise, increasing natural disasters, frequent changes in ecosystem, etc. During the last 50 years, specific climatic trends are listed as follow: the temperature rise by 0.05-0.20 degree from the south to the north; tropical cyclone frequency increase by 0.43; the sea level rise at a rate of 2-4 cm; the cold front frequency decrease from 0.49 events per decade. (ISPONRE 2009).[1]According to Vietnam Assessment Report on Climate Change, climate change would result in different impacts in most main sectors. In energy and transportation sector, some impacts are named as increase in power consumption and transportation vehicles, effects on offshore drill platforms, coalmine ventilation and cooling, etc.

On the other hand, one of the main causes for these negative effects is the large number of transportation vehicles resulting in rapidly increasing Greenhouse Gas Emission (GHG) especially in big cities. In Ha Noi, together with population growth, motorization has been making rapid progress with the increasing number of vehicle, in particular that of motorcycle. During the period of 2000-2010, the number of motorcycle increased from 1.82 to 4.04 million (See **Figure 1**)

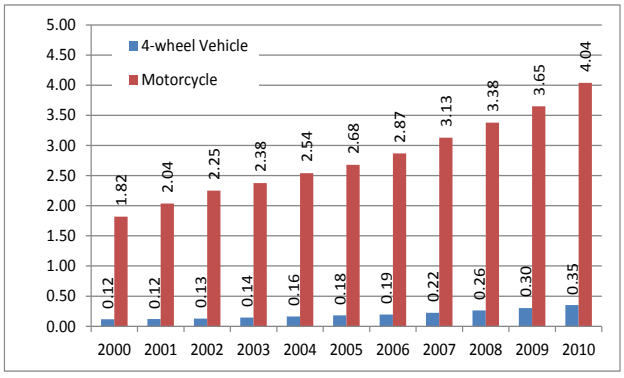

Fig. 1 Registered Vehicles in Ha Noi City (2000-2010) (million)

Source: Traffic Department, Ha Noi Police.

Regarding to GHG emissions, under the UN Framework Convention on Climate Change in the Initial National Communication and the Second National Communication (SNC), Vietnam reported the GHG emissions conducted and projected for the main sectors as can be seen in **Table 1 and 2**.It also implies the dramatic increase of CO2 emissions in energy sector from time to time.

Table 1 Emissions in CO2 equivalent (million tons) by main sectors in 1994, 1998 and 2000.

Sector/Year	1994	1998	2000
Energy	25.6	43.5	52.8
Industrial Processes	3.8	5.6	10
Land use, land use change and forestry	19.4	12.1	15.1
Agriculture	52.5	57.4	65.1
Waste	2.6	2.6	7.9
Total	103.9	121.2	150.9

Source: SR Vietnam. *Vietnam's Second National Communication under the United Nations Framework Convention on Climate Change.* Hanoi: Socialist Republic of Vietnam, Ministry of Natural Resources and Environment. 2010.

Table 2 Projected GHG Emissions in Vietnam by energy sector in 2010, 2020 and 2030 (Unit: million tons of CO2 equivalents)

Year	2010	2020	2030
Energy	113.1	251.0	470.8

Source: SR Vietnam. 2010.

2. Climate policy framework of Vietnam

Vietnam ratified United Nations Framework Convention on Climate Change (UNFCCC) on 16November 1994 and Kyoto Protocol on 25 September 2002. Since 17 August 2004, Vietnam has adopted the Strategic Orientation for Sustainable Development (Vietnam Agenda 21). Based on this direction, National Target Program to Respond to Climate Change, National Strategy on Climate Change, National Action Plan on Climate Change was approved in 2008, 2011 and 2012 respectively. Currently Vietnam is developing scenarios of climate change in Vietnam for the period 2010-2070.

Regarding to GHG emission, legally speaking, Vietnam is implementing direct and indirect mechanism. Under Kyoto Protocol, Vietnam has no responsibility to reduce GHG emission, therefore, only few provisions in Law on Environmental Protection 2005 regulates GHG emissions. In addition, there are also other legal measures which indirectly support GHG emission reduction such as legal provisions in environmental protection sectors, on environmental impact assessment and other regulations for specific related sectors (transport, energy, agriculture and forestry, etc). To identify specific strategic tasks related to GHG emission reduction, National Green Growth Strategy was approved in which the intensity of GHG emissions would be reduced by 8-10% in the period 2011-2020 and annually at least 1.5-2% towards 2030. More particularly, it also pointed out that GHG emissions from energy activities would decline by 10% to 20% and 20-30% during the period 2011-2020 and towards 2030 respectively. To achieve these objectives, it is necessary to both reduce any activities causing GHG emissions and promote sustainable activities such as green infrastructure, production greening, greening lifestyle and boosting sustainable consumption such as energy saving, etc. Fuel structure in industry and transportation is to be changed by reducing fossil fuel and encouraging renewable energy resources. In transportation field, bus and taxi are encouraged to use compressed natural gas fuel, liquefied gas.

3. Effects and challenges of climate policy framework in energy and transportation sector

From economic perspective, climate policy and environmental regulations affect business and production activities of any countries. Energy savings and programs on energy efficiency make enterprises change their working schedule. In Vietnam, especially in dry season, production factories and several offices, agencies are regulated to use electricity for a specific time in a day or a week. Moreover, as the objective of GHG reduction, companies are encouraged to invest in renewable energies, eco labeled products, green technologies, etc. In practice, companies using existing technologies and products might deal with difficulties such as lack of financial investment budget because green technology and products are relatively costly. Also, at the beginning step, the government is expected to give subsidies to any companies which are interested in this field so it can cause a financial burden for the government to achieve the goal of implementing climate policy and sustainable regulations. Obviously, to encourage people to use public transportation, the city government has to the big amount of money for bus operation, which becomes more serious when fuel costs are instable.

From social perspective, even though this legal framework brings about the increase in awareness of people about sustainable development, it might make a negative impact on social activities. Cutting down electricity in some residential areas and office buildings seems to be such annoyance for people in daily and working activities especially during hot weather. The so-called “modal shift” means making people change their habits from using private vehicle to public transportation. However, in the context of Vietnam, bus services have not met demand of passengers and the traffic characteristic in Ha Noi which has limited road network capacity with small narrow streets creates the habit of using motorbikes as transportation users consider them convenient and flexible to travel. In addition, the increase in economic development and population is a big challenge for Ha Noi city in terms of public transportation provision. In particular, the improvement of public transportation services is getting more and more necessary to attract a number of transportation users and mitigate traffic congestion.

4. Recommendations

To deal with the above mentioned challenges, to make this climate policy framework applicable and sustainable in general and in energy and transportation in particular, it is suggested that Vietnamese government should complete and clarify implementation process through specific strategic projects or programs. Whatever regulations are applied, legal, economic and social impacts should be taken into consideration to maximize benefits and minimize costs for the whole society.

For example, one of the recommended measures is to use GHG emission trading mechanism between Vietnam as developing countries with developed countries. On the one hand, enterprises have incentives to reduce emissions for making profits by selling credits. In addition, investments in clean and renewable energy resources such as wind, solar, geothermal, water, biomass are encouraged. On the other hand,

GHG emissions trading might cause problematic issues. First, Vietnamese government plays an important role in directing and controlling the business between domestic companies and foreign investors so it easily abuses rights to give favorable conditions to state-owned companies, which is considered unfair to foreign and private companies. Second, "cap and trade system" seems too complicated, because it requires costly administration, increases government costs and lowers revenue compared to other measures such as carbon tax. Since economic crisis in 2009, the government expenditure has been much taken into considerations and at present, spending money on such costly mechanism is believed to be challenging.

To implement GHG emission trading, therefore, economically speaking, several factors should be clarified before parties come to the trading agreement such as demand and supply capacity for GHG emissions. Pricing mechanism for GHG emissions is also important to achieve win-win agreements between involved parties. Furthermore, for such developing countries like Vietnam, it is crucial to forecast and evaluate benefits and costs of each GHG emission trading cases. There is much likelihood that foreign investments in clean and renewable energy would not bring about benefits as much as recipient countries expect. Evaluating benefits and costs for specific GHG emission trading cases helps to adjust or modify the mechanism for applying more effectively. From specific customers such as energy users, they might suffer from the increasing cost when companies use costly investments. From legal point of view, the government, as above mentioned, should create a fair and beneficial environment so that any companies are able to participate in this trading market. Moreover, the fair and transparent legal mechanism encourages companies to become more attractive and operate more effectively. Bureaucracy should be avoided not only to attract foreign investors but also to encourage potential companies to be involved in this market. Corruption easily occurs as the government is able to make a profit through selling credit system. Besides, the governments also have to deal with foreign countries so in case of infringements or violations, they are more likely to become political issues which are not easy to tackle with. In particular, political instability not only in region but also in the world has been increasing such as regional conflicts and disputes, therefore GHG emission trading is obviously affected by various external conditions.

Similarly, a variety of measures in transportation sectors have already been introduced in Vietnam such as staggered school hours and alternative work schedule, road pricing, parking management and promoting public transportation but they have not brought about big improvements for transportation situation in Vietnam. The point is that any regulations must ensure to optimize benefits of the society and they are required to be simple and applicable for the typical characteristics of Vietnam transportation. Otherwise, people are not willing to follow the regulations and the aim to reduce private vehicles and then reduce GHG emissions cannot be achieved.

Last but not least, to evaluate the measures to reduce GHG emission, methodology for estimating GHG emission reduction should be much taken into consideration. Theoretically speaking, in transportation sector, there are two main methods to estimate GHG emission based on fuel consumption (top-down approach) and traffic volume (bottom-up approach).According to Feasibility Study Program on New Mechanisms by the Ministry of the Environment Japan and Global Environment Centre Foundation since 2010, the method based on traffic volume has been applied in Laos in which future transport demand is required through conduction of transport simulation and socio-economic data usage. In Indonesia, another method has been used through calculation CO2 emissions from aerobic decomposition. In Vietnam, bottom-up type energy demand and supply model has been used for estimating CO2 emissions and it requires many data related to traffic volume, road network and emission factors of vehicles, etc. The estimating methodology is useful for assessment of GHG reduction measures and for policy-makers to make best decisions.

Endnotes

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