

THE PARTICIPATION OF ENTERPRISES IN CLIMATE CHANGE POLICY: THE CASE OF HO CHI MINH CITY

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ABSTRACT

Awareness of critical role of enterprises in climate change response, the paper demonstrates on examining of the climate change integration of business. Number of 101 out of 120 questionnaires was collected from companies. All six aspects of climate change integration received a low rate of "YES" response. About 76.2% does not mention on process improvement. Up to 81.1% does not have any targets to reduce greenhouse gas emissions or include this goal in the company's strategy and action plan. The majorities of businesses are not interested in product development and/or estimated their emissions. Up to 83.2% of enterprises do not intend to implement greenhouse gas emission reduction of suppliers. Many enterprises do not mention new product or market combination as well as pay their attention on possibility of partnership and or entrance of new markets but not give any details. An about 37.6% companies does not care about the market mechanism for emissions and/or not participating. About 62.4% does not apply the market mechanism and are not noticeable on this issue.

Due to the low climate change participation of business, it is of important to apply seven-step process to promote the climate change integration into development strategies of business, especially for those in energy-intensive industries.

Keywords: Ho Chi Minh City, Climate change policy, Enterprise, Climate change integration

1. BACKGROUND OF THE STUDY

As a crowded, fast developed and urbanized city, Ho Chi Minh City is facing a challenge of development from severe influence of climate change. This vulnerability of the city has rooted from two reasons. The first one comes from its geographic location. Ho Chi Minh City is located not only in the lower part of the Southeast region but also in the lower part of the Dong Nai river system with large water flows (Storch & et. al, 2009; ICEM, 2009; ADB, 2010). The city also

has many large tributaries running through such as Saigon, Dong Nai and Nha Be River. Such a natural location makes the City facing natural disasters and the risk of rising sea levels. The latter, the main one, falls in the inappropriate and unsustainable urbanization. The process of urbanization is so rapid but has not been studied in the context of natural and social space that exacerbates the effects of climate change.

Under the impact of climate change, Ho Chi Minh City has suffered a lot of damages. According to Nicholls et al (2008), by 2070, the City is projected to be one of the world's five largest port cities in the world most affected by climate change. In Asia region, the City receives the fourth ranking among the cities of vulnerability to rising sea levels (Senga, 2010). In addition, flooding is becoming more serious with the appearance of new flood spots.

To response the aforementioned situation, Ho Chi Minh City has issued and implemented many climate change policy. Ho Chi Minh City has established a Board of Climate Change Response to show its determination in reducing the impact of climate change. Many programs and projects on climate change are implemented. However, most of them are very much technically environmental such as projects on environmental improvement, reducing emissions, using clean fuels. There are few projects and action programs on climate change response with the focus of involvement of people and communities, although people, enterprises and communities play a decisive role in climate change response.

Enterprises in all fields are seriously affected and severely damaged by climate change.

According to the National Statistical Survey Program prescribed by the Vietnamese Prime Minister, conducted every 5 years, by the end of December 2016, Ho Chi Minh City had 171,655 operating enterprises (Thuy Hai, 2018). Enterprises in the industrial sector are severely affected. Ho Chi Minh City is a major industrial center in Vietnam with many important industries and foreign investment. The model of Ho Chi Minh City's industrial development from now to 2025 is based on 4 groups of industries with high levels of science, technology and added value (mechanical, electronics, information technology, chemicals-rubber, processing of fine foodstuffs) and biotechnology, clean industries, energy saving. The city is planning to develop 22 export-processing zones - industrial parks with a total area of 5,918 hectares, a high-tech park with a total area of 913 hectares, Quang Trung Software City of 43 hectares, and industrial clusters with a total area of 1,900 hectares. The total land area for development of export processing zones - industrial parks and industrial complexes will be 8,774 ha by 2020. Climate change under the worst scenario proposed by the Ministry of Natural Resources and Environment will cause an inundated area accounting for 23% of natural land area. Majority of

inundated area is planned for industrial zone. Due to this, many industrial zones will be seriously affected by climate change and sea level rise (Thuy Hai, 2018).

Most of the industrial zones will be heavily flooded with over 10% in the positive situation and up to 67% of the area in the worse situation. To illustrate, Hiep Phuoc Industrial Park in Nha Be District located next to the Nha Be River will be strongly influenced by the tide of East Ocean. Some other industrial parks will be also significantly affected such as Phong Phu Industrial Park, Le Minh Xuan Industrial Park, and High-Tech Park (Thuy Hai, 2018).

Similarly, referring to scenario developed by Asian Development Bank (ADB) experts, the majority of industrial parks and industrial clusters in the city will be affected. Climate change will directly impact industrial parks by flooding and shrinking of land for industrial development.

Sources of raw materials for industry, especially for food processing industry, leather and textile industries, garment which is one of the key industries will have a significant decline, even exhausted because of climate change.

Enterprises in Agriculture, Forestry and Fishery are also seriously influenced. Agriculture in Ho Chi Minh City accounts for a small proportion of the city's GDP, but the agricultural land area is still about 120,000 ha. Under the most optimistic climate change scenario by the Ministry of Natural Resources and Environment, 6.3% of the city's natural land area is flooded, thus the city's agricultural production area will be least impacted. Agriculture affected areas include most of Binh Chanh and a part of Hoc Mon and Cu Chi districts (Thuy Hai, 2018).

Service industry businesses are also affected by climate change. The model of service development in Ho Chi Minh City is based on 9 high-class service sectors (finance-credit-banking-insurance; commerce; transportation, warehousing, port services; post-telecommunications and information technology-media; property-real estate business; information service consultancy, science-technology; tourism; health care; education-training). Most service industries are concentrated in the existing central areas of the city. Service development planning is always associated with urban development planning. The city has planned to develop large-scale urban areas such as West-North, South Saigon, Thu Thiem and Phu My Hung urban area (Nguyễn Trọng Hoà, 2012).

The aforementioned analysis has proved that businesses are actors that have created and aggravated climate change as well as victims of this phenomenon. Therefore, businesses must participate in climate change response with practical actions, of which the most important and sustainable is to integrate climate change response into the enterprise's strategy. With this logic,

it is necessary to assess the participation of enterprises in climate change response through evaluating the degree of integration into the overall development and action strategy of each enterprise (Ans & Pinkse, 2005, p. 20).

2. METHODOLOGY

This paper use quantitative approach to examime to climate change integration of enterprises in Ho Chi Minh City. The paper employes questionnaires to collect primary data. For businesses in Ho Chi Minh City, the paper chooses 120 companies in export processing and industrial zones to survey, including Southeast Industrial Park, Linh Trung 1, Tan Thuan, Vinh Loc, Bac Cu Chi, Tan Thoi Hiep, Tan Tao and Binh Chieu. They are energy-intensive industries. The number of questionnaires delivered is 120. The number of questionnaires collected is 120. The number of valid questionnaires is 101. The author uses convenient random survey methods to collect data.

3. THEORETICAL FRAMEWORK

3.1. Climate change and Climate change response

The topic of climate change and climate change response has received much attention from researchers because it affects the survival of the earth and the prosperity of economies.

The FCCC (Framwork Convention on Climate Change) defines climate change as direct or indirect change made by human. The human has changed the composition of the atmosphere and created many new elements into nature over time” (Pielke, 2004). The concept of climate change by FCCC emphasizes human activities and considers them as the main cause of climate change. This concept indirectly suggests that in order to control climate change, it is necessary to control human activities make them become more friendly and beneficial to the climate and the natural environment.

Agreeing with this view, the Steering Committee of the Climate Change Reponse action program on agriculture and rural development in Vietnam posted on its official website the concept of climate change that is the change in state of climate compared to the climate and/or climate fluctuations persist for extended periods of time, usually for decades or longer. Climate change is due to human activities that change the composition of the atmosphere during land exploitation and use.

Contrary to the above view of PCCC, IPCC advocates more broadly climate change, is any changes in climate over time due to human activities or the natural world (Pielke, 2004). IPCC does not only limit its definition to climate change due to human activities but also to natural

fluctuations. With such a concept, IPCC recognizes that people need not only control their harmful activities to limit climate change but also must be able to adapt to climate change.

It can be seen that when discussing the cause of climate change, many scientists acknowledge that the cause is from a natural, not entirely human. An illustration for this is the collision of a giant meteorite with the earth, causing the earth's surface covered with a thick layer of dust, which prevents the lighting towards the earth. When discussing Climate change response, countries, governments and scientists all focus on two solutions: mitigation and adaptation, face-to-face and reconciliation. Stemming from these two important reasons, this paper chooses the concept of climate change from the perspective of IPCC; it is any change of climate over time due to human activity or the natural world.

Based on this concept, climate change response includes two actions: adaptation and mitigation. The concept of adaptation describes changes in progress or structures to reduce potential hazards, or to take advantage of opportunities that appear to be associated with changes in climate (Lambrou & Piana 2006, p.8). Mitigation emphasizes the aspect of preventing or limiting climate change (Lambrou & Piana 2006). Mitigation often focuses on restricting the causes of climate change such as the increase in greenhouse gases (Lambrou & Piana 2006).

3.2. Enterprises and climate change integration

Enterprises have an important role in climate change response, especially energy-intensive industries. For these companies, implementation of “cap-and-trade system” could be an appropriate approach. From this approach, enterprises are motivated to integrate climate change (emissions scheme) in their setting goals of their development strategy. For not-energy-intensive, there would be an alternative that is voluntary participation in emission reduction initiatives.

From the government side, more flexible and adequate regulations are required to motivate enterprises and give them more chances to integrate the climate change response in their development strategies. The success of climate change response of companies has positive relationship with level of climate change integration. Level of integration of the development and action strategy of each enterprise is presented in some important aspects. The first is to improve the production process in an environmentally friendly manner. The second is the issue of converting greenhouse gas emissions within the company. The third is product development towards environmentally friendly products. The fourth is the impact and pressure of businesses on stakeholders in the supply chain. The fifth is the response of businesses to the issue of emission schemes and trading of emissions schemes. The sixth is acquisition of emission Credits (Kolk & Pinkse, 2005).

The six aspects are presented in the beloved matrix.

		Main aims	
		Innovation	Compensation
Organisation	Internal (Company)	Process improvement (1)	Internal transfer of Emission Reductions (2)
	Vertical (Supply chain)	Product development (3)	Supply-Chain measures (4)
	Horizontal (beyond the supply chain)	New product/market combinations (5)	Acquisition of Emission Credits (6)

Figure 1: Strategic options for climate change

(Source: Kolk & Pinkse, 2005)

The “main aim” indicates strategic intent of the company’s development strategy that are innovation for climate change reduction or compensation of adaptation. These six aspects all focuses on three organizational levels ranging from individual company (internal), supply chain and interaction within enterprises outside the supply chain.

Measurement scaled are listed in the following Table 1:

Table 1: Measurement scales of climate change integration

Items	Measurement
I. Process Improvement	<ol style="list-style-type: none">1. Do not mention process improvements2. Mention process improvements as potential measures, without giving any details3. Mention process improvements that lead to emission reductions, which are not explicitly related to climate change4. Mention specific process improvements related to climate change that are operational at this moment.5. Mention concrete results of process improvements that have been achieved recently
II. Internal Transfer of Emission Reductions	<ol style="list-style-type: none">1. Do not have internal reduction targets or do not mention it<ul style="list-style-type: none">Have the intention to set targetsAre running a pilot project to estimate current emissions4. Have several reduction targets on a local level and/or integration of emission indicators in investment plans5. Have reduction targets for the whole organization and/or an internal emissions trading scheme

III. Product Development	<ol style="list-style-type: none">1. Do not mention product development and/or estimates of product emissions2. Mention product development and/or estimates as potential measures, without giving any details3. Estimate product emissions, but do not have any concrete product innovations4. Have product innovation policy, but do not estimate product emissions5. Have product innovation policy and/or give concrete examples of product innovation for climate change and estimate product emission.
IV. Supply-Chain Measures	<ol style="list-style-type: none">1. Do not intend to take measures to reduce emissions of suppliers2. Do not measure emissions of suppliers, but do not give an opinion on the matter3. Take a favorable stance towards supply chain measures, without giving any details4. Suppliers' environmental performance is evaluated and/or ISO 14000 certification is required5. Specific emission evaluation and/or targets are in place for the supply chain

<p>V. New Product/Market Combinations</p>	<ol style="list-style-type: none"> 1. Do not mention new product/market combinations 2. Mention possibility of partnerships (in the future) and/or entrance of new markets, without giving any details 3. Explore partnerships and/or entrance of new markets 4. Concrete partnerships and/or new market entrance are mentioned, but no actual action yet 5. Refer to real partnerships and/or entrance of new markets.
<p>VI. Acquisition of Emission Credits</p>	<ol style="list-style-type: none"> 1. Oppose market mechanisms and/or do not intend to engage 2. Do not apply market mechanisms, but do not give an opinion on the matter 3. Take a favorable stance towards market mechanisms, without giving any details 4. Take initial action with regard to market mechanisms, such as engagement in design phase of a trading scheme or execution of pilot transactions 5. Take concrete action with regard to market mechanisms

(Source: Kolk & Pinkse, 2005)

It is necessary to clarify that in Kolk & Pinkse’s paper, “climate strategy was measured on a fully anchored 5-point scale, with different anchors per dimension”. However in the situation of Ho Chi Minh City, the enterprises are not fully awareness of climate change. The government’s climate change policy in not inclusive enough to progress the climate change response of business. Due to these drawbacks, this paper uses “yes” and “no” to measure the response of enterprises in the questionnaires.

4. THE PARTICIPATION OF ENTERPRISES IN CLIMATE CHANGE POLICY IN HO CHI MINH CITY

Production process improvement

The first aspect of participation of enterprises is to improve the production process in an environmentally friendly manner. Enterprises show their responsibilities in climate change response by improving the production process that is good for the environment in both mitigating and adapting to climate change. Survey results are shown in the following Table:

Table 2: Production process improvement

Items	Response	
	Number	%
1. Do not mention process improvements	77	76,2
2. Mention process improvements as potential measures, without giving any details	6	5,9
3. Mention process improvements that lead to emission, reductions, which are not explicitly related to climate change.	8	7,9
4. Mention specific process improvements related to climate change that are operational at this moment	4	4,0
5. Mention concrete results of process improvements that have been achieved recently	5	5,0
Total	101	100

As shown in the Table 2, about 76.2% of response did not mention on process improvement. Only 5.9% considered process improvement as the potential measures; 7.9% paid their mention to process improvements that lead to emission, reductions, which are not explicitly related to climate change; 4.0% mentioned specific process improvement related to climate change that are operational at this moment. There are only 5.0% of businesses that mentioned concrete results of process improvements that have been achieved recently. In another words, there are about 17% of businesses that have specific action to improve production process with the consideration of environment and climate change.

Internal transfer of Emission Reductions

Another aspects of enterprises' participation in climate change policy in their action to transfer emission reductions internally. The survey results are shown in the Table below:

Table 3: Internal transfer of Emission Reductions

Items	Number	%
1. Do not have internal reduction targets or do not mention it.	82	81,1
2. Have the intention to set targets.	12	11,9
3. Are running a pilot project to estimate current emissions.	3	3,0
4. Have several reduction targets on a local level and/or integration of emission indicators in investment plans.	2	2,0
5. Have reduction targets for the whole organisation and/or an internal emissions trading scheme.	2	2,0
Total	101	100

The table shows up to 81.1% answered that they do not have any targets to reduce greenhouse gas emissions or mention this goal in the company's strategy and action plan. Among responding businesses, 11.9% said that they were interested but did not take any specific action. Only about 7% of businesses are aiming to reduce emissions and take practical steps to achieve this goal. Surveyed data shows that the number of responding businesses paid little attention integrating emission reduction into the company's action plans and strategies.

Product development

The third aspect used to evaluate the participation of enterprises in the implementation of climate change policy is the product development in an environmentally friendly manner. Regarding this content, the survey results are shown in the following Table 4:

Table 4: Product development

Items	Number	%
1. Do not mention product development and/or estimates of product emissions.	78	77,2
2. Mention product development and/or estimates as potential measures, without giving any details.	13	12,9
3. Estimate product emissions, but do not have any concrete product innovations.	5	5,0
4. Have product innovation policy but do not estimate product emissions.	3	3,0
5. Have product innovation policy and/or give concrete examples of product innovation for climate change and estimate product	2	2,0

emissions.		
Total	101	100

In this context, the majority of enterprises surveyed responded that they were not interested in product development and/or estimated their emissions (with 77.2%). Up to 12.9% of businesses responded that they mentioned product development and/or method of calculating emissions of products but not in details. About 5% of respondents said they have estimated emissions but do not have any initiatives related to environmentally friendly products. Around 3% of businesses had a policy of product innovation but did not estimate of product emissions. And only 2% of the survey respondents said that they have a product innovation policy and/or have specific examples of product innovations related to climate change and estimates emissions of products.

Involvement of enterprises in the implementation of climate change policy is not only limited to internal production activities, but also the impact and pressure of enterprises on stakeholders in the supply chain. This means that, if a single business has ability of influence on the supply chain, making the supply chain take practical actions in the climate change policy, the situation of the climate change policy in HCMC would have many advantages and better results. Survey results related to supply chains are shown in the Table below 5:

Table 5: Supply chain measures

Items	Number	%
1. Do not intend to take measures to reduce emissions of suppliers.	84	83,2
2. Do not measure emissions of suppliers, but do not give an opinion on the matter.	15	14,9
3. Take a favorable stance towards supply chain measures, without giving and details.	1	1,0
4. Supplier’s environmental performance is evaluated and/or ISO 14000 certification is required.	1	1,0
5. Specific emission evaluation and/or targets are in place for the supply chain	0	0

Up to 83.2% of enterprises participating in the survey responded that they did not intend to implement greenhouse gas emission reduction of suppliers. About 14.9% of respondents did not measure emissions of suppliers and did not give any opinion on this issue. About 1.0% of respondents concerned with supply chain solutions but without giving details. Around 1.0% of

the respondents rated their ability to improve their environment and / or required their suppliers to have ISO 14000. And more importantly, 0% of businesses carries out specific emission reduction solutions and/or set emission targets for the supply chain.

New product/market combinations

Another aspect of climate change integration of business is new product or market combination. This is to measure climate change integration in innovation of business as well as taking the partnership into account in their development strategies.

Table 6: New product/market combinations

Items	Number	%
1. Do not mention new product/market combinations.	50	49.5
2. Mention possibility of partnerships (in the future) and/or entrance of new markets, without giving any details	51	50.5
3. Explore partnerships and/or entrance of new markets.	0	0
4. Concrete partnerships and/or new market entrance are mentioned, but not actual action yet	0	0
5. Refer to real partnerships and/or entrance of new markets.	0	0
Total	101	100

As shown in the Table 49.5% of enterprises does not mention new product or market combination. There is 50.5% have paid their attention on possibility of partnership and or entrance of new markets but not give any details.

Acquisition of Emission Credits

The most direct issue of climate change that countries around the world are most concerned with is emission quota and trading of emission. In this regard, the survey results are shown in the following Table 7.

Table 7: Acquisition of Emission Credits

Items	Number	%
1. Oppose market mechanisms and/or do not intend to engage	38	37,6
2. Do not apply market mechanisms, but do not give an opinion on the matter.	63	62,4
3. Take a favorable stand towards market mechanisms without giving any details	0	0
4. Take initial action with regard to market mechanisms such as engagement in design phase of a trading scheme or execution of pilot transactions	0	0
5. Take concrete action with regard to market mechanisms	0	0
Total	101	100

Around 37.6% of respondents did not care about the market mechanism for emissions and/or not participating. These businesses are indifferent to the emissions market. About 62.4% answered that they did not apply the market mechanism and did not comment on this issue. This issue only stops at the survey of businesses' opinions about the emission trading market, because in fact, this market does not exist in Vietnam. However, the survey results partly show that businesses are not really interested in this market since the market does not exist yet and the profit issue has not been clearly shown.

5. CONCLUSION AND RECOMMENDATIONS

Ho Chi Minh City Government needs to organize seminars on the sustainable development of businesses with the city's climate change policy. The city presides over training and retraining courses on integrating climate change response into the enterprise development strategy.

In addition, the city should combine cooperation, propaganda and education with administrative management and coercive measures for businesses that do not comply with the provisions of the climate change regulation.

The management and action framework for climate change response for businesses is recommended to be included six aspects with specific items in from Table 1 to 6. Accordingly, Ho Chi Minh City should offer a set of 06 criteria with specific instructions for each. These six contents include improvement of production processes towards environmental friendliness; convert greenhouse gas emissions within the company; develop products in an environmentally

friendly manner; the solutions for the supply chain; and the issue of buying and selling of emissions. These items are assessed by five-level ratings. Level 1 is the lowest and 5 is the highest.

The proposed framework will be applied as description in the below flow chart.

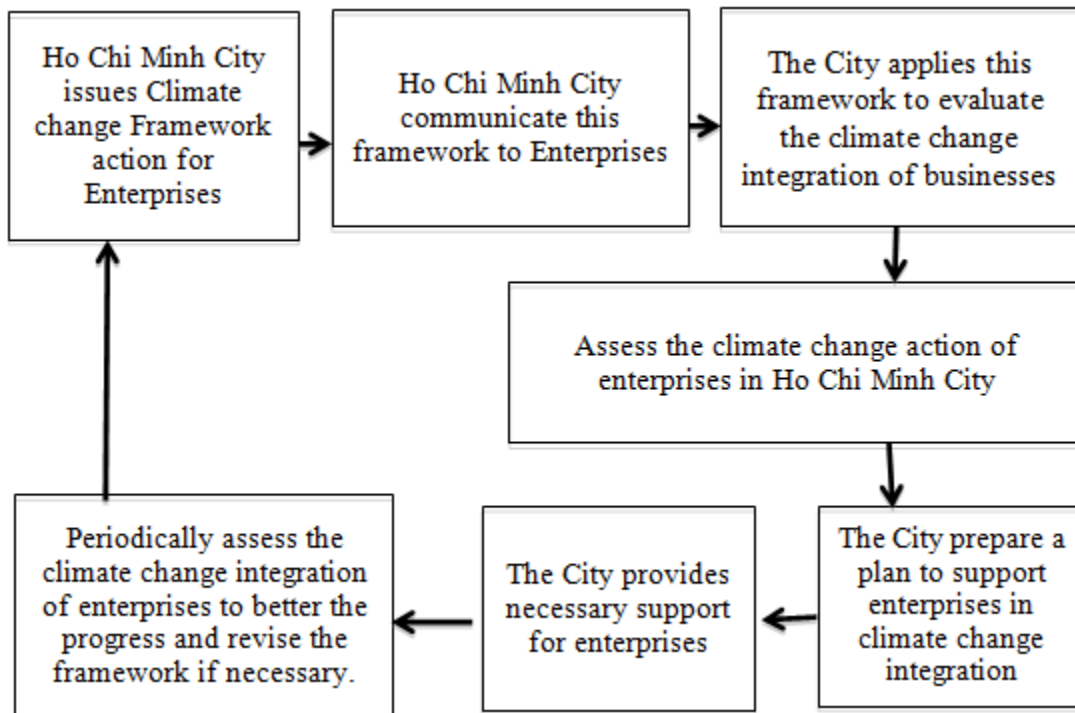


Figure 2: Framework supporting climate change integration

Ho Chi Minh City needs to complete the set of monitoring criteria for climate change for businesses (Climate change Framework action). This process involves a broad participation of business partners, scientists and managers, with an emphasis on international experience.

Then Ho Chi Minh City uses this framework to survey the current situation of climate change response of businesses. This survey then provides Ho Chi Minh City Government with information about the current situation of climate change integration in enterprises. From that Ho Chi Minh City develops a plan to monitor the enterprises' climate change implementation. The plan should clearly define the priorities and supports for businesses related in their climate change integration.

Ho Chi Minh City Government then provides necessary supports. One year after the support are implemented, Ho Chi Minh City reassess situation of climate change integration of businesses

according to framework established. This reassessment is to make plans for the next year, as well as to handle businesses that do not follow the committed schedule. This process is repeated annually.

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