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**Faculty of Economics and Business Administration**

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## POLICY TAX FOR ENVIRONMENTAL PROTECTION IN SOME COUNTRIES IN THE WORLD AND LESSONS LEARNED FOR VIETNAM

Nguyen Thi Kim Ngan<sup>a\*</sup>, Tran Van Hiep<sup>a</sup>, Le Thi Thuy Ha<sup>a</sup>

<sup>a</sup>Hanoi University of Mining and Geology, 18 Vien Street, Duc Thang Ward, Bac Tu Liem District, Hanoi, Vietnam

\*Corresponding author: nguyenthikimngan@humg.edu.vn

**Abstract:** *The environmental protection tax policies in countries around the world often have two main goals, which are to encourage polluters to reduce the amount of waste discharged into the environment and to increase the revenue of the state budget through the introduction of environmental costs included in the price of products following the "Polluters pay" principle. Currently, many countries collect taxes related to environmental protection for products and goods when used, which will cause bad impacts on the environment. Vietnam has also been applying environmental tax policies, especially the introduction of the Law on Environmental Protection Tax No. 57/2010 / QH12 dated October 15, 2010. However, besides positively and effectively affecting the country's economic, political and social life, Vietnam's environmental protection tax policies still have limited problems regarding taxable subjects; Time of tax calculation; Tax calculation framework. Therefore, the article will analyze environmental protection tax policies in some countries in the world, thereby drawing lessons for Vietnam in developing and implementing environmental protection tax policies to achieve the set goals.*

**Keywords:** *environmental protection tax; environmental protection tax policies.*

### 1. OVERVIEW

Environmental tax, alternative names energy & fuel tax, green tax, air pollution fees, or environmental renovation fee, etc.), is one of the economic measures that in some countries are regularly used as direct revenue to the State budget to carry out the socio-economic development and environmental protection targets.

On the one hand, this policy encourages the polluters to cut down the number of wastes discharged into the environment by capitalizing the environmental utilization fees into production costs based on the «People who discharge pollutants and who utilize the environment need to payback» principle.

On the other hand, the environmental tax policy is an effective tool to prevent pollutants and regulate the beneficial interests

between businesses and society. Hence, it emphasizes healthier social relations, promoting the sense of savings, minimizing the wastes of natural resource exploitation and usage, and strengthening the solutions to protect the environment.

Many countries currently collect environmental taxes on goods and products that will negatively impact environmental conditions. Vietnam has also been applying the environmental tax policies, especially with the induction of the Environmental Taxation Law No. 57/2010/QH12 issued on October 15, 2010. Besides the favorable results on the economic, political, and social life, in Vietnam, the environmental tax policies still show many limitations, including taxable objects, time to calculate taxation, tax calculation framework, etc. Therefore, in the following articles, we will analyze the environmental tax policies in

some countries worldwide, hence concluding lessons about developing and implementing the environmental tax policies to achieve the targets in Vietnam.

## 2. THE ENVIRONMENTAL TAX POLICIES IN SOME COUNTRIES AROUND THE WORLD

### 2.1. The environmental tax policies in Switzerland [1]

According to the Environmental Performance Index (EFI) in 2018 regarding the global ranking concerning high-prioritized environmental issues resolution, Switzerland is the leading country with a score of 87.42/100. To achieve such results, Switzerland has implemented the environmental policies since 2007, right after the global financial crisis. Particularly to the Green Economic Action Plan by the Swiss Government, the plan involves:

- Green-up the taxation and charging system through the environmental taxes:

- Like those in most OECD countries, the energy taxes usually account for a huge proportion in the environmental tax. In Switzerland, energy taxes are mainly contributed by the on-land transportation sector with more than 45 % and steadily increasing over the past 20 years. Such differences are due to two opposite trends: (i) the number of vehicles increased by 21 %, and (ii) Sum of the energy consumption is reduced by nearly 4 %. The structure of the environmental tax in Switzerland is illustrated under the table 2.1 below:

Besides the environmental tax, Switzerland also collects other environmental-related fees, including fees for aircraft landing and waste stream charges.

Table 2.1. The structure of the environmental tax in Switzerland

No.	Taxation Components	Proportion %
1	Petrol/Gasoline tax	50
2	Motor vehicles tax	20
3	Traveling distance & large-weighed trucks	15
4	Carbon tax (tax on CO <sub>2</sub> ) on the fuel used for heating and productions	5
5	Tax on volatile organic compounds (VOC)	5
6	Combustible wastes, and urban wastes, etc.	5
	Sum	100%

(Source: Collection by the author)

According to table 2.1, we can see that the environmental tax policy in Switzerland covers 3 main categories, which are energy, transportation, and wastes. In particular:

**i) Energy taxation:** The most remarkable energy tax is the gasoline tax and the Carbon tax. All of the energy sales revenue is subjected to the value-added tax (VAT) rate of 8 %. The Carbon tax is levied on fossil fuels (e.g., heating oils, natural gas, charcoal, coke, etc.), used for heating, lighting, and generating electricity in the heating and operating welding and resembling systems. The CO<sub>2</sub> tax rate is determined by the weight (in tons) of raw materials and the CO<sub>2</sub> content of each type of energy. The CO<sub>2</sub> tax rate in 2014 (60 CHF/ton) was twice as the rate in 2008 (36 CHF/ton); by January 2016, the rate was 84 CHF/ton (equivalent to EUR 77.00). Companies that produce greenhouse gas (GHG) will be considered for exemption from the Carbon tax if they commit to reducing GHG emissions until 2020 continuously.

**ii) Transportation taxation:** The motor vehicle owners must pay an annual tax amount to the authority at which they reside. The federal tax on motor vehicles accounts for 20 % of the total environmental tax revenue. The tax rate depends on either the vehicle's weight, its distribution, or both of them. Electric vehicles or energy-efficient vehicles are eligible for tax discounts or exemptions in some regions. Some states, such as Geneva or Obwalden, grant some incentives if the purchasers consume less-polluting cars. Besides, to encourage residents to use public transport instead of private cars, the Government deducts the costs of traveling by public transport from the annual costs. Furthermore, Switzerland Government grants annual tax deductions for bicycle commuters.

In 2001, large-weighted trucks or heavy-goods carrying vehicles are subjected to taxes. The tax rate is calculated based on traveling distance and weight of vehicles and is distinguished by the emissions following the European standards. Tax revenues are used to build national railway tunnels and solve the noise problems from the roads. Moreover, implementing transportation taxes contributes to the changes in traveling methods from roads to railways. Such revenue sources will be used as compensation to the residences for noises from roads and emphasize resolutions for security, safety, and environment.

**iii) Taxation on the wastes discharged:** Since 2000, Switzerland has restricted burying flammable and biodegradable municipal wastes. The environmental protection act states that the municipal wastes must be managed following the principle of polluting process; through a bin-liner based fee, the residents will have to pay additional fees for each plastic bag used. To encourage recycling, the Government applies recycling surcharges on each glass and battery item, plastic bottle (PET), aluminum can, and food container. As

the prepaid recycling fees are also applicable to plastic bottles, aluminum can, and food cans, the recycling rate has increased significantly (the rate of recycling PET bottle has risen to 80 % in 25 years). For electrical and electronic equipment, manufacturers and importers need to pay for the recycling surcharges for the equipment that will be circulated later.

## **2.2. The environmental tax policies in Sweden [2][3]**

Along with its Nordic neighbors, Sweden was the first country of the European Union that applies taxes, fees, and other economic measures to protect the environment. According to a 2004 OECD member country assessment, Sweden was the most economically active country in environmental protection. Among various economic measures, environmental tax is one of the most significant methods in Sweden. The Carbon tax, sulfur tax, and nitric oxide (NO) charges were executed from the early 1990s; until the late 1990s, reform of landfill tax and green tax was accomplished. Several types of taxes and fees that are related to the environment were growing quickly and gradually completed.

According to the statistics gathered by the Department of Environmental Protection in 2005, Sweden collected about Cuaron 68 billion annually (equivalent to EUR 7 billion) from taxes and fees related to the environment, with a majority (about 95 %) coming from transportation taxes, energy resource taxes, CO<sub>2</sub> tax, sulfur tax, and collected fees from natural resources exploitation. The environmental tax in Sweden tends to increase gradually during 2005-2015; energy tax accounts for the largest proportion (nearly 90 %) of the overall environmental taxes. Environmental taxes make up about 3 % in Sweden's GDP. The taxation collecting procedures in Sweden are indicated in table 2.2.

Table 2.2. The procedures for applying environmental taxes in Sweden

No.	Types of environmental tax	Effective year	Remarks
1	CO <sub>2</sub> tax; Sulfur (S) tax and NO charging fees	1990	
2	Landfill and green taxes	1991	
3	Tax rate based on emissions (if measurable)	1991	
4	Fees charged on the NO <sub>x</sub> content from fixed pollution sources	1992	Mainly from the power plant
5	The tax rate on lead gasoline should be greater than that on no-lead gasoline	1994	
6	Increase the tax rate on CO <sub>2</sub> , NO, sulfur oil, and plant protection products	2004	

(Source: Collection by the author)

Currently, Sweden is building a "Green taxation" system, collecting environmental taxes instead of hitting on income tax, especially aiming at the tax of using energy sources, thus, observing the pollution emissions and carrying environmental protection. The main purpose of implementing the green tax collection is to reduce CO<sub>2</sub> emissions and prove energy efficiency. Collecting environmental taxes instead of income taxes improves the efficiency of taxation, known as the compound interest. From 2010 to 2020, the Swedish Government expects to transform Cuaron 30 billion (equivalent to EUR 3.3 billion) from income taxes to the green taxes.

The current environmental taxes in Sweden address 3 major components: taxes on energy sources, Carbon (C) tax, and sulfur (S) tax. Fuel, oil, coal, and natural gas are all subjected to the energy tax; however, electricity and industrial manufacturing are

exempted from this kind of tax. This tax rate varies among different regions in Sweden; especially, the Northern's tax rate is lower than in other regions. Besides, the Government has imposed special non-quota taxation on nuclear electricity and hydroelectricity.

Implementing environmental taxes improves environmental conditions through changes in people's behavior and an increase in tax revenues. To minimize expenses and optimize profits, the manufacturers will try to reduce their emissions and gain more net benefits. Over these years, the air quality and emissions in Sweden have been dramatically improved; for example, during 2004-2015, the amount of NO<sub>x</sub> emitted decreased by 60 % compared to that in the previous period, and sulfur emissions from diesel engine vehicles fell by 75 % on the average. It can be concluded that in Sweden, the environmental tax is one of the most effective economic tools representing the "green tax, clean tax" policy and that it brings a huge revenue to the Federal budget while reduces CO<sub>2</sub> emissions and increases using renewable energy. During the period of applying the environmental tax policies, especially in the period of 2005-2015, the emission decreased by 9.2 %, and the amount of renewable energy consumed increased by 25 %.

### 2.3. The environmental tax policies in China [3][4]

China now has 4 taxation laws related to environmental protection, including resources tax, consumption tax, tax on vehicles and ships, and other transportation tax. These taxation laws play a role as a guide for people to use, reasonably exploit resources, and use energy. Like many other countries around the world, China, besides collecting environmental taxes, also implements several tax incentive policies to encourage energy savings, such as preferential VAT rate on some items that use clean energy or promote

the regeneration of wastes and used raw materials, exemption from corporate income tax granted for enterprises that replace their technologies with the friendly environmental technology or the energy, water, resources-saving systems.

On the other hand, China has also adopted numerous financial policies to promote energy saving and environmental protection. Consumers who purchase energy-efficient products will be entitled to financial sponsorship of 50 % costs; else, special funds will be established to serve the environmental protection, for instance, funds for the usage of renewable energy, funds for the use of biogas, etc. Particularly to the year of 2004, China's Ministry of Finance has been coordinating with a national committee to pass the regulations on the procurement of energy-saving equipment among the Government agencies.

In 2018, China started executing the Environmental Taxation Law, which was approved by December 25<sup>th</sup>, 2016 and officially effective by January 1<sup>st</sup>, 2018, as a replacement for the old surcharge fee policies, which were in use over the past 40 years. This is the first independent tax law in China's green tax system; it plays a very critical role in reducing pollutions and building a civilized ecological environment. The taxation subjects include non-business units and manufacturing organizations that directly release pollutants into the territorial environment and the territorial waters according to China's jurisdiction (Article no. 2, the Environmental Taxation Law).

Residents do not fall under taxable subjects. Thus, the taxable subjects include air pollutants and pollutants in water, solid waste, and noises. Regarding the tax collection level, according to the Environmental Taxation Law, there are 4 major types of polluting activities, which are activities causing air pollution, water

pollution, solid waste discharged, and noise pollution. All of them are subjected to tax collection. Each pollutant is subjected to different tax rates, depending on the geographical conditions and economic status. For instance, China collects environmental taxes on 44 air pollutants released by the manufacturing facilities and factories. These taxable substances involve sulfur dioxide (SO<sub>2</sub>), nitrogen dioxide (NO<sub>2</sub>), carbon monoxide (CO), carbon disulfide (CS<sub>2</sub>), etc. The tax rates fall between 1.2 - 12 yuan and between 1.4 - 14 yuan per polluted water unit. China does not prescribe fixed tax rates for each air pollutant and uniformly applies throughout the country under the following mechanism "The central government regulates the minimum tax rates, then the local authority will determine the official tax rates accordingly".

The method to calculate taxes is mentioned in the Article 8, 9, and 11 under China's Environmental Taxation Law. It involves 3 steps: (i) Calculate the number of emissions in each air pollutant by dividing the number of pollutants for the pollution value as per specific content in the Law of Environmental Protection, (ii) Sort by the pollution level from high to low, and (iii) Determine the tax amount by the total tax amount on 3 substances that have the highest pollution levels. Also, the new law strictly regulates over water management in rural areas, at which water pollution level is extremely high, but none of the management activities are effective. The law also states clearly that China Government supports the construction of water and waste treatment facilities in rural villages and requires the standards in using fertilizers and pesticides to comply with the national requirements of environmental protection. The law also raises the penalties for polluting practices. Moreover, the localities have the right and authority to determine the tax rates based on the Central Government's scope set. All

environmental taxes are now transferred to the local budget, while previously 10 % of them are required to submit to the Central.

China's Environmental tax policies on emissions have obtained multiple results. By the end of the third quarter of 2018, the total environmental tax declared was 21.84 billion yuan and 6.86 billion yuan were exempted. The amount of environmental tax collected on wastes is 13.5 billion yuan, accounting for 89.8 % of the total taxation amount, and 85.7 % of the pollutants are sulfur dioxide, nitrogen oxide, and dust in general. Collecting environmental taxes has contributed to control the pollution emissions. Among the big cities of China, Beijing, Tianjin, and Hebei, after implementing the environmental tax collections, have reduced the amount of SO<sub>2</sub> by 22,000.00 tons (22.7 %) and cut down the amount of NO<sub>x</sub> 35,000.00 tons (13.1 %). Nevertheless, according to the experts, by implementing the new Law, China improves the quality of environmental management through direct budgeting management, thereby expecting to regain control over toll collections, intransparent usage, and incorrect charges by the localities.

#### **2.4. The environmental tax policies in Singapore [3]**

Singapore, a country of 100% urban area with a dense population, is famous for its greenest, cleanness, and beauty. To achieve such results, Singapore has adopted plenty of policies related to environmental protection. Since the 1970s, Singapore has established the Ministry of Environment and the Department of Pollution Prevention to accomplish the plans to control air pollution, water pollution, and solid waste management. Lately, both organizations undertook additional responsibilities - monitoring and handling toxic substances. Two critical areas addressed by the Singaporean Government and the most famous successes are drainage

system management and solid waste management. In particular, these addressed areas include: providing a comprehensive draining system to collect and properly treat the domestic wastewater and the production wastewater and organizing an effective managing system to manage the solid waste.

The Singaporean Government first launched the Green Plan in 1992 and continued with a revised Plan in 2012. Such plans aim to track down the population of unstable animals and plants, thus establishing new natural parks and connecting with the existing parks. Moreover, Singapore issues the environmental laws, including: (i) The environmental and public health act: this Act addresses the issues of noise, public sanitation, solid wastes, hazardous wastes, and the control over food businesses, burial and cremation, and swimming pools management, (ii) The environmental pollution control law: this Law governs those issues related to the environmental pollution control and associate activities, (iii) The draining system act: this Act regulates the construction, the maintenance, and the improvement of sewers and underground draining systems that serve the water treatment, commercial emissions, and associate activities, and (iv) The import-export and transition of hazardous wastes Act: this Act covers the import-export and the transit of hazardous wastes and other emissions.

Singapore is actively taking further steps to reduce greenhouse gas emissions upon the commitment signed during the Climate Change Conference in Paris. On June 3<sup>rd</sup>, 2013, the Singaporean Government announced that they would begin recording the number of carbon emissions released in the whole country and the amount of carbon that has been absorbed by the flora system.

Besides, Singapore's environmental tax policies have grown dramatically. There are 3



main categories under their tax and fees system: the pollution fees charging on wastewater, the energy & fuel taxes, and the taxes on solid waste.

The fees charging on wastewater: tariffs on pollution hit on the biochemical oxygen demand (BOD) and total suspended solid substances (TSS) and applies to all industrial facilities. The tariff rates are determined based on the amount of wastewater and the concentration of pollutants. The allowable amount of BOD and TSS in the public systems is 400mg/liter. Any facilities with the BOD concentration level falling between 401mg/liter and 600mg/liter must pay a fee rate of SGD 0.12/m<sup>3</sup>. If the concentration level is 1,601-1,800 mg/litre, the rate will increase to SGD 0.84/m<sup>3</sup>. If the contaminant level is 601-1600mg/liter, the rate will rise by one level per 200mg/liter. Such policies' limitations are that the same amount is chargeable to all, regardless of the facilities' sizes and ages.

The energy & fuel taxes: the taxes are collected based on the sulfur content of goods and products. The taxable subjects include gasoline, oil, and coal. In Singapore, the tax rate charged on gasoline is SGD 0.4/litre - equivalent to VND 6,400/liter.

As in 2019, Singapore has been planning to implement the first Carbon emissions Tax in Southeast Asia, a strategy that will increase the energy fees and force more than 30 energy plants to take responsibility for causing pollution. Following this new strategy, the tax rate will increase to SGD 10.00 - SGD 20.00/ton of CO<sub>2</sub> (equivalent to USD 7.00 - USD 14.00/ton) and the rate on five other greenhouse gases. Such changes are also equivalent to USD 3.50 - USD 7.00 increasing per barrel of oil, boosting the electricity prices up by 2 %-4 %. This strategy is the most economical and equitable way to reduce greenhouse gas emissions; thus, polluters will need to take necessary

actions to protect the environment. The collection from this tax will be a financial source to support cutting down the industrial emissions in Singapore.

### 3. CURRENT SITUATION OF VIETNAM'S ENVIRONMENTAL PROTECTION POLICIES [5] [6] [7] TAX

To carry out sustainable development and environmental protection, Vietnam has initiated many taxes and fee policies, including:

i) The environmental tax: this tax law is effective from January 1<sup>st</sup>, 2012. The taxable subjects are substances that can cause pollution, including petrol, oil and grease, coal, HCFC liquid solution, plastic bags, herbicides, pesticide, preservative products, and unusual warehouse sterilizers. This taxation law demonstrate the use of taxes in protecting the environment, controlling polluting substances and goods, contributing to change people's awareness, and promoting sustainable economic development following the trend around the world;

ii) Special consumption tax: this tax is imposed on several goods that need to be restricted from further production and consumption, involving tobacco, gasoline, automobile vehicles, beer, wine, air conditioning, etc. As a result, the harmful effects on the environment have been minimized;

iii) Royalties (Natural Resource Tax): The royalty rates are distinguished by groups and types of resource; the rates can be from 1 % (for surface water that is used to produce clean water) to 20 %, 30 %, and 35 % (for bird's nests and other rare and precious timber, etc.). Such tax rates have impacted the exploitation, the economical and efficient usage of resources, and the protection of the ecological environment. The natural resource tax is also a very important tool for the

governing bodies to emphasize the management and supervision procedures over the exploitation activities;

iv) Other fees, such as fees recharged on wastewater and rubbish, environmental protection fees imposed in mining activities, etc.

We can conclude that the current tax provisions related to the environment, as in the Vietnamese taxation system, have created revenues for the State budget and improved the environmental awareness and behavior of both organizations and individuals. However, these impacts are still as limited as the tax policies' role in protecting the environment. The major existing limitations are:

(i) Incomplete and unfair taxable subjects: the Environmental Taxation Law indicates 8 groups of taxable subjects, such as oil, grease, coal, plastic bags, restricted herbicides, etc. However, some various products and goods potentially cause pollution that has not yet been listed to the law. These products include industrial emissions, cigarettes, radioactive waste, toxic substances (e.g., inorganic acids, caustic soda, plant protection chemicals, organic solvent, mercury, etc.), electronic goods - which generate electronic waste, rubber (e.g., tires, tubes, etc.), and polymer, etc.

ii) The tax rates are not responsive to the number of pollutants. According to the IEA statistics, total CO<sub>2</sub> emission from burning fuels in 2016 was 187.1 million tons, of which 113.2 million tons from burning coals (equivalent to 60%), 51.6 million tons from petrol (28%), and 22.3 million tons from natural gas (12%). Hence, the main proportion of Vietnam's pollution is from coal burning, instead of petrol using. Furthermore, according to the U.S Energy Information Administration (USEIA), as with the same energy unit (Kcal, mmBtu, or GJ), the emissions from coal-burning are higher than from oil-burning, particularly to each

component as following: 2.3 times higher for SO<sub>2</sub>, 32.7 times higher for dust, 6.3 times higher for CO<sub>2</sub>, and 2.3 times higher for mercury.

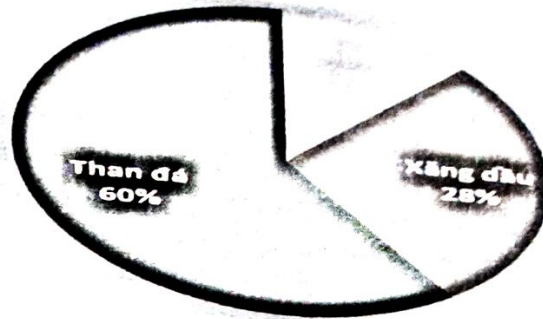


Fig 1. The contribution proportion in CO<sub>2</sub> emissions in 2016 [7]

Nevertheless, the statistics provided by the Ministry of Finance shows that the total revenues from collecting the environmental taxes in 2016 were VND 41.924 billions, of which gasoline tax accounted for VND 41.062 billion (equivalent to around 98%), while the tax on coal only contributed VND 806 billion (less than 2%). Hence, the tax rate was unfair if gasoline emissions contributed only 28%, but the segment would need to pay for 98% of the total environmental taxes.

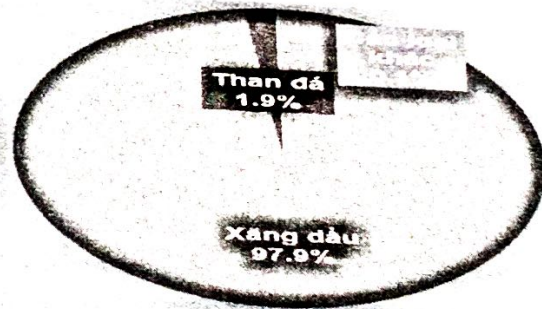


Fig 2. The contribution proportion in the environmental tax revenues in 2016 [7]

On the other hand, the tax collection component that is effective by January 1<sup>st</sup>, 2019 shows the unit price of VND 4,000/litre for gasoline, VND 2,000/litre for diesel oil, VND 30,000/ton maximum price for coal. Converting to the number of carbon emissions released, the tax rate required for gasoline is USD 74.9/ton of CO<sub>2</sub>, USD 32.7/ton of CO<sub>2</sub>

for diesel oil, and USD 0.5/ton of CO<sub>2</sub> for coals. It means that the current environmental tax rate for gasoline is 156 times higher than that for coal and the rate for diesel oil is 68 times higher than that for coal.

iii) The environmental tax policies consistently serve the environmental targets and goals: since the introduction of the environmental tax in 2012, the total revenue collected from this tax has increased by 6 times in comparison with the amount of VND 11,000 billion at year zero, up to VND 69,000 billion as per expectation in 2019; in particular, gasoline and oil account for more than 90 %. According to the latest statistics by the Ministry of Finance, the total environmental expenses are VND 72,422 billion from 2013 to 2018.

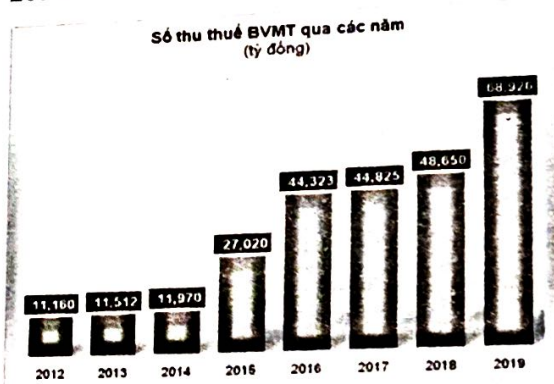


Fig 3. Revenue collected from the environmental tax during 2012 - 2019

(Source: The Ministry of Finance)

According to the approved State budget in 2019, the estimated revenues from environmental tax collection were VND 68.926 billion. This means that within 7 years, the revenues have increased more than 6 times, equivalent to 35% growth. Up to now, the environmental tax policies have been applied for quite a while, especially the Environmental Taxation Law has been executed for 7 years, an adequate time length to comprehensively evaluate the effectiveness of this tax law. However, based on the current stage of pollution and the highly devastating environmental

conditions, we can conclude that the environmental tax policies are still incompatible with environmental protection targets.

#### 4. LESSONS LEARNED AND RECOMMENDATIONS FOR VIETNAM

##### 4.1. Lessons learned for Vietnam

Based on the studies of several environmental taxation policies in some countries over the world and based on the current implementation of the environmental tax policies in Vietnam, we can suggest some lessons for Vietnam as below:

- The main purposes of collection taxes related to the environmental protection are: (i) to cut down the number of emissions causing environmental pollution, (ii) to contribute to the sustainable socio-economic development, (iii) to reduce the energy consumption, especially the consumption of non-renewable energy, and (iv) to establish a budget for the socio-economic development and the environmental protection;

- The application of the environmental tax and protection fees policies depends on the particular conditions in each country; however, such policies are currently applied in most countries, especially in OECD member countries. The applicable policies involve: (i) The environmental taxes, (ii) The natural resources tax, (iii) Recharge fees on wastewater, wastes, and noise pollution, and (iv) Tax on energy/fuel, green tax, tax on vehicles, etc. [7]

- To encourage people to cut down the emissions and pollutants that are discharged into the environment, the policy planner should transfer the cost of utilizing the environment into the production costs following the principle "Polluters and beneficiaries pays back for what they use";

- The taxable subjects must fully comply with the tax policies based on the mentioned principle and the tax rates are varied

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responsively to the seriousness level of the consequences.

- The taxation revenues should be used to support and grant incentives for the environmental projects, the protection strategies, and the development of renewable energy to draw more attention and participants, including both businesses and individuals, through publish and transparently implement the plans and strategies and ensure the effectiveness, to spend on researching and studying the supporting mechanism through taxation and fees policies in application onto the businesses, which commit to execute the environmental protection plans and demonstrate favorable results.

#### 4.2. Some recommendation in applying the environmental tax policies in Vietnam

From the lessons concluded above, in addition to assessing the current situations of implementing the environmental taxation policies in Vietnam, the policymakers should pay more attention to the following issues:

i) Additional studies about the taxable subjects are necessary (besides the identified 8 items). The supplement substances include chemical fertilizers, detergents, growing stimulants, coal & gasoline, natural gas, disposable plastics, prepackaging products, plastic membrane, plastic sheets, polyethylene plastic rolls, etc. It is also necessary to revise and develop more comprehensive and detailed regulations on the taxable subjects and non-taxable subjects to ensure tax management procedures, avoid fraudulent and errors in tax declaration, and promote the environmental protection acts.

ii) To establish the tax rates, it's necessary to review, calculate, and evaluate the polluting level in respondents to each type of goods; the tax rates are determined based on scientific foundations, proving that they are according to the environmental results.

iii) Review and revise (if applicable) the provisions under tax policies, the nature of which is similar to the environmental tax, special consumption tax, or any other environmental recharging fees to ensure the comprehensiveness and uniformity, avoid duplication, and especially align with the principles and purpose of each type of tax.

iv) Regulations about the use of tax revenue in protecting the environment should be specified. All taxes collected are concentrated and serve the reimbursement in general in the State budget, particularly for environmental protection purposes. Such a viewpoint, manner, and goals of using tax to protect the environment shall be clarified in the tax policies. On the other hand, it's necessary to specify the details of the expenditures incurred for the environmental protection, involving those happened for encouraging the friendly environmental applications, technologies, and the incentives and discounts on the eco-friendly goods, allocating the investments to different infrastructure works, hence, promptly recovering the environmental conditions from degradation.

v) Research and establish Carbon tax: in the long run, it's required to conduct researches on the carbon tax - the tax on CO<sub>2</sub> emissions that are released from the process of burning carbon-containing fuels. A carbon tax is expected to be an important taxation content to reduce carbon emissions. Nowadays, more and more countries recognize this tax as a critical solution against environmental pollution in general and climate changes, particularly the visible threats toward human life and natural ecosystems on Earth. The carbon tax is a new kind of tax; even though we do not have any experience with this tax, we cannot skip such trend. The carbon tax is a tool to adjust the external costs to internalize the negative external costs on a global scale, related to CO<sub>2</sub> emissions, production costs and

effectively reduce the amount of CO<sub>2</sub> emissions. Taxing carbon amounts in burning fuels will fasten the search for alternative sources of clean energy.

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