

TAX AND ENVIRONMENTAL INCENTIVES TO USE HYDROCARBON-BASED AIR CONDITIONING UNITS IN THAILAND

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Abstract

Environmental protection is one of the most important global issues in the 21st Century, and ozone layer depletion is among the most serious environmental problems. The ozone layer is being destroyed by a group of manufactured chemicals containing chlorine and/or bromine. These chemicals are called ozone-depleting substances (ODS). The main ODSs are chlorofluorocarbons (CFCs) and hydrochlorofluorocarbons (HCFCs), which are mostly being used in refrigeration and air conditioning (RAC) systems. The Montreal Protocol is an international agreement to protect the ozone layer, and Thailand is one of the countries which have signed it. Under the Montreal Protocol, Thailand has committed herself to phase out and phase down the use of ODSs, but this would be impossible without a clear environmental tax law to control import/export and the use of ODSs and ODS-based refrigeration and air conditioning (AC) units. Thailand is listed as a developing country in the Article 5 countries of the Montreal Protocol, which states that all of the Article 5 countries should phase down and ban the use of ODSs with the help of laws and regulations. The situation in developed countries is totally different. They must ban the use of ODSs faster than Article 5 countries because due to their facilities doing these kinds of projects, it is much more easily practicable and faster than in developing countries.

There is no environmental tax law in Thailand to control or ban manufacturers from producing HCFC- and HFC-based AC units and the traders from importing them. This lack of an environmental tax law is a barrier to the incentivizing of the use of ODS alternatives, such as hydrocarbon (HC) based air conditioning units. In addition, the customs tariffs for all gasses used in AC units are the same, and all of them are under the same section in the Harmonized System (HS) code, so this is another disincentive to the use of HC-based AC units.

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This article looks at the environmental tax laws of Australia and the United States as the best means and most successful instances of control and banning of the use of ODSs and ODS-based equipment. This study suggests that Thailand must ratify an environmental tax law and amend the customs laws and regulations in order to achieve its obligations under the Montreal Protocol.

Ultimately, the findings of this study aim to help Thailand develop a sustainable business model for HC-based air conditioning units among ASEAN countries, as the country plays a major role in the business of all of these countries.

Keywords: Hydrocarbon-based air conditioning unit, environmental incentives, environmental tax laws and ozone-depleting substances.

Abbreviations:

AC	Air conditioning
ACS	Australian Customs Act
AHECCS	Australian Harmonized Export Commodity Classification System
ASEAN	Association of Southeast Asian Nations
BOI	Board of Investment
CAAA	Clean Air Act Amendments
CFC	Chlorofluorocarbons
DIW	Department of Industrial Work
GWP	Global warming potential
HC	Hydrocarbon
HCFC	Hydrochlorofluorocarbons
HFC	Hydrofluorocarbon
HS	Harmonized System
HSA	Hazardous Substance Act

HSCB	Hazardous Substances Control Bureau
IRS	Internal Revenue Service
LGW	Low global warming
MLF	Multilateral Fund
NOU	National Ozone Unit
ODS	Ozone-depleting substances
RAC	Refrigeration and air conditioning
TISB	Treaties and International Strategies Bureau
TSA	Toxic Substance Act
USEPA	U.S. Environmental Protection Agency
UV	Ultraviolet

INTRODUCTION

The Montreal Protocol on the substances that deplete the ozone layer was agreed upon in September 1987 as an international response to the significant threats to the environment and human health posed by a continued use of ODSs in the global economy. (Uneporg, 2015)

HCFCs as ODSs are currently used extensively throughout a range of different types of refrigeration and air conditioning (RAC) systems. The numbers of AC units are increasing in tropical areas, especially among ASEAN countries, due to global warming in the world and especially this region, as well as to the growing number of mega buildings. All ASEAN countries have signed the Montreal Protocol or its amendments. Thailand is the main producer and exporter of air conditioning units in the ASEAN region. Thailand is also a large importer of HCFCs, with a total of 16,890 metric tons of HCFCs imported in 2010. (Worldbank.org, 2015)

New regulations and legislation to ban the production of HCFC-based AC units in Thailand will be in place soon. The World Bank is helping the government to set up these new required regulations, which will support the production of HC- and HFC-32-based AC units and will ultimately change the policies that govern Thailand's exports to ASEAN countries. According to the Montreal Protocol, because of the economic situation in developing countries, the transition time is different from that of developed countries. More specifically, it is longer. Developed countries are expected to ban the use of ODSs without financial support from the World Bank, but a country like Thailand needs support from the World Bank due to its economic situation and a lack of resources to support using the ozone-friendly products. The lack of laws and regulations, coordination between governmental authorities and sufficient political support prevents Thailand from banning ODS-based AC units over a short period of time.

On the policy side, the government of Thailand has decided to impose a ban on manufacturing HCFC-22-based ACs for the domestic market by 2017 in order to reduce the HCFCs demand and to catalyze a move towards more energy-efficient technologies while meeting the Montreal Protocol's targets. A dominant alternative technology, in fact, exists: R-410A. Due to the high global warming potential (GWP) of R-410A, however, this chemical could become subject to international control in the near future. Most Thai-owned air conditioner manufacturers have decided to adopt HFC-32, which has lower GWP. This technology is also being deployed in Japan, China, India and Indonesia. This decision of Thai-owned air conditioner

manufacturers has led to subsequent decisions of the multinational companies to also introduce the HFC-32 air-conditioners to replace their HCFC-22 and HFC-410A products in the Thai market.

It should also be considered that the importing countries in the ASEAN region are also members of the Multilateral Fund for the implementation of the Montreal Protocol (MLF) and thus have an obligation to control and reduce the demand for HCFCs in their own countries. Therefore, importing countries must change and set up a new legislation to support the importation of HC and HFC-32-based AC units from exporting countries. It is reasonable to expect that customs laws, environmental tax laws and other incentive systems will make possible an easy importation of HC/HFC-32 AC units to ASEAN countries in the future. (Boigoth, 2015)

In response to the environmental impact of ozone depletion and GWP arising from the release of HCFCs, the use of natural refrigerants as alternative is becoming more widespread. Amongst these natural refrigerants, hydrocarbons are being used widely in new air conditioning systems, but studies of the United Nation Environment Program confirm that there are still not enough incentives for businesses to invest in and import low global warming (LGW) technologies and products in developing countries.

Therefore, this individual study is aimed to understand and identify the role of national laws (especially customs law and environmental tax law) which should lead to the amendment of laws to incentivize enterprises and traders to produce and import/export HC-based air conditioning, which is not harmful to the environment, in Thailand.

This study looks at the current situation in Thailand as a developing country and also as one of the ASEAN members. It will then compare it with the situation in Australia and the USA as case studies.

RESEARCH METHODOLOGY

This study has been carried out by using the method of documentary research. It is a study on the law of Thailand (as a member of ASEAN countries), specifically on the customs act and the environmental tax law to control and ban the trade of HCFC/HFC-based air conditioning units and to incentivize the importation and use of HC-based air conditioning units with respect to the Montreal Protocol. Also, the relevant laws of Australia and the United States have been reviewed and discussed as case studies and best practices.

Reference sources include text books, journals, articles, documents and official reports of the United Nations Environment Programme and other International Agencies, as well as other information related to phase out/down of HCFCs and HFCs.

Development of Environmental Law to Control ODSs in Thailand

The National Ozone Unit (NOU) of the Hazardous Substances Control Bureau (HSCB) of the Department of Industrial Work (DIW) under the supervision of the ministry of industry, has the main responsibility for implementing ODS phase-out strategies in Thailand. (Multilateralfund.org, 2015)

The Department of Industrial Work houses the NOU, whose main responsibility is to ensure the country's compliance with its

obligations under the Montreal Protocol. The Treaties and International Strategies Bureau (TISB) is responsible for determining the overall import quotas for HCFCs. The HSCB is responsible for allocating the overall annual import quotas issued by the TISB to each importer. The HSCB is also responsible for monitoring actual imports/exports made by importers/exporters and reporting back to the TISB as part of its facilitation role for reporting and consumption verification. The import and export control of HCFCs is also enforced by the customs bureau to ensure that only HCFC shipments with a license issued by the HSBC are allowed to be imported and exported. These agencies provide a system of checks and balances to ensure effective control of the imports/exports of HCFCs. (United Nation Environment Programme and Stockholm Environment Institute, 2000)

For air pollutants from factories, the controlling law is the Factory Act of 1992. The Ministry of Industrial Work is authorized to set industrial emission standards and control measures for air pollution. The penalty for violation of the controlling standard is quite severe: a fine not exceeding 200,000 Baht, however, with no imprisonment penalty.

The customs law is comprised of statutory and regulatory provisions enforced or administered by the customs administration concerning the importation, exportation or transit of goods. Most of the customs statutes are codified in the Customs Act B.E. 2469 and its subsequent amendments. In addition, goods imported into Thailand require classification under the Customs Tariff Decree B.E. 2530. Thai customs acts regulate and facilitate the movement of goods across the borders and also define a system to collect taxes and other revenues. Moreover, Customs,

with its HS codes, is able to incentivize, control or ban the exportation and importation of goods through coordination with other governmental and private sectors and also with international agencies.

The Toxic Substance Act (TSA) of 1967, which was re-authorized and renamed as the Hazardous Substance Act (HSA) in 1992, is the major legislation governing hazardous substances. The regulatory scheme of the HSA consists of the provisions for the establishment of an advisory body known as the Hazardous Substance Control Committee and the creation of a permit system for import, export, production, distribution, use, and disposal of the specified hazardous substances. (Jetrogojp, 2015) Since 1992, the HSA has established a centre of information on hazardous substance in the MIW to coordinate and share information with other government agencies and the private sector, in order to facilitate the permit system. (Thailawscom, 2015) HCFCs and HFCs are two kinds of hazardous substances which are included under section 2903.71 to 2903.75 of the HS code. This part of the law is therefore the only and thus the major part to be used for controlling the importation of HCFCs and HFCs. There is no other specific law to control the importation of HCFC-based air conditioning units.

Foreign Laws (Australia and the USA) Concerning the Importation of HCFC-based Air Conditioning Units

ODS Law in Australia:

Australia has always been at the forefront of efforts to protect the ozone layer. There are good reasons for Australian involvement.

Protecting the stratospheric ozone layer is particularly important because of Australia's sunny climate and outdoor lifestyle. Ozone depletion, because it allows dangerous UV rays to reach the earth's surface, can have a direct effect on the health of Australians and their environment. The Australian contribution to this environmental effort is also notable because it comes from business, government, environment and conservation groups and the general community. It is a good model for future environmental activity and it could also be considered as one of the best examples for a country like Thailand, which has almost same weather and a growing number of AC units. Moreover, coordination between different authorities in Australia is a perfect example for Thailand. By coordination between public and private stakeholders with different governmental authorities, Australia has become one of the most successful countries in the world to curb its use of ozone-depleting substances and fulfill its obligations under the Montreal Protocol. At the same time, Australia's environmental tax law is a good model for Thailand to follow as it works towards the ratification of its own environmental tax law. To formulate and administrate an efficient environmental tax law system, a Technical Working Group to the review was established to provide detailed comments and technical advice to the authorities throughout the review. The Technical Working Group is made up of representatives from a range of industries impacted by the legislation. The Technical Working Group members are: the Victorian Automobile Chamber of Commerce, the Australian Industry Group, the Fire Protection Association of Australia, the Plastics and Chemicals Industry Association Australia, the

Refrigerant Reclaim Australia, the Automotive Air Conditioning, the Electrical and Cooling Technicians of Australia (VASA), the Australian Institute of Refrigeration, the Air Conditioning and Heating, the Air conditioning and Mechanical Contractors Association, the Air Conditioning and Refrigeration Equipment Manufacturers Association, the Refrigerants Australia, and the Australian Refrigeration Association

With the discovery of the ozone hole over Antarctica in 1985, Australians felt exposed and vulnerable to ozone layer depletion. Australia suddenly became more attuned to the environmental impact of global activities. There was also a growing realization that Australia was one of the world's largest per capita users of ODSs. The Ozone Protection and Synthetic Greenhouse Gas Management Act of 1989 has the main responsibility for controlling ODSs in Australia. The Act controls the manufacture, import and export of all Ozone Depleting Substances (ODSs) and Synthetic Greenhouse Gases (SGGs) while the Regulations control major end-uses.

ODS imports are monitored through quarterly reporting to the Department of the Environment, submitted by the licensees in accordance with their license conditions (Ozone Protection Act of 1989, Section 46). Voluntary information is also provided by trade associations and importing companies. Specified requirements on record keeping by the licensees are included in the ozone protection regulations. Data provided by the licensees is cross-checked against the information provided by the customs authorities.

In 1997, the Australian Customs Service (ACS) amended its customs regulations for prohibited imports and exports to include

controlled ODSs under the Ozone Protection Act 1989. This empowered the ACS officers at the customs stations to ask all registered ODS importers for a license number issued by the Department of the Environment prior to obtaining import/export clearance. The ACS's computerized database for logging and clearance of imports and exports automatically prompts officers for a license number when a customs tariff code or an Australian Harmonized Export Commodity Classification System (AHECCS) export number for an ODS is entered. Information on ODS imports is compiled by the Department of the Environment for review and study purposes. (United Nations Environment Programme and Stockholm Environment Institute, 2000)

Since 1 July 2010, Australia's government, under the license conditions of the pre-charged equipment license, has banned the import of most air conditioning equipment containing or designed to operate with HCFC refrigerants (whether the equipment is gassed or not). Any imports received in Australia after this time have been denied entry unless the equipment is exempt under the condition outlined in the importer's existing pre-charged equipment license.

On 18 May 2011, when amendments to the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989 and Ozone Protection and Synthetic Greenhouse Gas Management Regulations 1995 came into force, the ban was extended to include the import and manufacture of both refrigeration and air conditioning equipment containing or designed to operate with HCFC refrigerant (whether or not it is also designed to operate using another substance).

From this date, the import and manufacturing of equipment containing HCFCs

or HCFC-based products has been prohibited unless it is done by the holder of a pre-charged equipment license who has been granted a partial fee waiver for a one-off low volume import.

Under the Australian government's Clean Energy Future plan, an equivalent carbon price will apply to synthetic greenhouse gases covered by the Kyoto Protocol. This will be implemented through the Ozone Protection and Synthetic Greenhouse Gas Management Act 1989.

As a result, importers of these gases (in bulk or contained in products and equipment), are required to pay an equivalent carbon price related to the global warming potential of these gases. These gases are not manufactured in Australia, but any domestic manufacturer would also be required to pay the equivalent carbon price.

ODS Law in the U.S.

ODS control in the United States did not develop as fast as it did in Australia due to the different circumstances faced in this country. Both countries are developed countries but the situation in the U.S. was not as urgent as in Australia. The reasons include the fact that the United States is colder than Australia, the outdoor life style is different, the hole in the ozone layer is not located in this part of the world, and finally, the consumption of ODSs in the United States was less than in Australia. Therefore the United States did not need immediate action to ban the use of ODSs. It is thus another good example for Thailand, which will also ban the use of ODSs gradually.

Title VI of the 1990 Clean Air Act Amendments (CAAA) mandates the development and implementation of regulations

to protect the stratospheric ozone layer and ensure U.S. compliance with the Montreal Protocol on substances that deplete the ozone layer. Under the Montreal Protocol, the United States and other signatories are obligated to achieve progress toward the total phase out of the consumption and production of HCFCs, which are ODSs and have been widely used as refrigerants, solvents, foam blowing agents, and fire suppressants. (Lawdigital commonsbc.edu, 2015)

The U.S. Environmental Protection Agency (USEPA) has the main responsibility for implementing ODS phase-out strategies. (Phaseoutfacts.org, 2015)

The following federal statutes and regulations are used to control ODS:

First of all, sanctions against violations of the 1990 CAAA and its regulations include inter alia fines, jail and withdrawal of permits to operate, such as withdrawal of certificates for refrigerant technicians. Second, authority to impose sanctions appears in Section 113 of the Clean Air Act. Third, individual regulations cite specific sanctions for specific violations and finally, criminal enforcement actions have been taken under 1990 CAAA. (United States: West Group, 1998)

Federal regulations on ODSs for certain applications ("End Use Controls") generally prohibit the sale of the selected products instead of their use in manufacturing, installing or servicing such products. As requested by the 1990 CAAA Section 613, the USEPA has issued regulations requiring each government department, agency, etc. to amend their procurement regulations to conform with the requirements of the 1990 CAAA and related USEPA regulations (40 CFR Part 82 Subpart D Section 82.80-86). (United States: West Group, 1998).

The 1990 CAAA prohibits persons who maintain, repair or dispose of refrigeration and air conditioning equipment from knowingly venting ODS refrigerants to the atmosphere. (1990 CAAA Section 608 c) These requirements are also applicable to any substitute for ODS refrigerants. 1990 CAAA Sections 608 and 609 instruct the USEPA to establish standards and requirements on the use and disposal of ODS refrigerants in order to reduce use and emissions and maximize the recapture and recycling of the refrigerants. The USEPA has issued such regulations as 40 CFR Part 82 Subpart F (Section 82.150-166) to implement the general requirements in 1990 CAAA Section 608 and 40 CFC part 82 subpart B (section 82.30-42) to implement the specific requirements for servicing of motor vehicle air conditioners in 1990 CAAA Section 609. Subpart F contains general requirements related to the service, maintenance, repair and disposal of stationary appliances which contain ODS refrigerants, including requirements directed to declaimers, appliance owners and manufacturers of appliances and recovery or recycling equipment.

The U.S. has imposed an excise tax on CFCs, halons, carbon tetrachloride and 1,1,1-trichloroethane, which is applicable to these chemicals when sold or used by a producer, manufacturer or importer (IRS Code Section 4681-4682). The tax is also applicable to imported products which are made with these chemicals. It takes into account the ozone-depleting potential of each chemical and is gradually increased year by year. The tax is administered by the U.S. Internal Revenue Service (IRS). (Europaeu, 2015).

Analysis of the Problems: Lack of Environmental Tax Laws and Legal Framework to Ban Importation and Production of HCFC-Based AC Units in Thailand

Portable air conditioning units are classified as air conditioners, purifiers, fans and heaters, air conditioning units and air conditioning machines that incorporate a refrigerating unit (HS code: 84158310). Based on this classification, the import duty rate for importing a portable air conditioning unit into Thailand is 1% and the import Value Added Tax (VAT) rate for importing a portable air conditioner is 7%. There are, however, some exemptions. For instance, importation from ASEAN countries is exempted from the duty, and importation from Australia and New Zealand is duty free according to a multilateral agreement with Thailand. (Goth, 2015). It is of great importance that there is not any difference between various kinds of air conditioning units except for their wattages. In this kind of classification, the customs Act does not mention anything about the substances which AC units contain or rely upon. This means that it does not matter if they use harmful HCFCs or ozone-friendly HCs.

Naturally, importers prefer to import HCFC-based air conditioners as they know that it will be easier to sell them in the market with a cheaper price. At the same time, the market is not familiar with HC-based air conditioning systems, and customers are reluctant to spend more money on these new products with higher prices. Furthermore, no incentives exist to encourage traders to import HC-based air conditioning units.

Thailand is one of the main consumers of HCFC-based air conditioning units. The

number of condominiums and hotels and new shopping malls increases every year, which means that Thailand has to import more and more air conditioning units. The consumption of HCFCs will therefore increase in the future, which is against Thailand's environmental policy and also against the related multilateral agreements this country has signed. If Thailand continues to import HCFC-based air conditioners, there is no way to reduce the consumption of HCFCs in this country. These two issues are very much interrelated. At this stage, environmental taxes will help Thailand to decrease the importation of HCFC refrigerants and HCFC-based air conditioning. At the same time, tax incentives for HC-based air conditioners will increase the demand of the market for the alternative AC units.

Among all types of ODSs, only the import and sale of consumer aerosols using CFCs as a propellant have been banned since 1990. (An exception is made for medical aerosols) Ministry of Commerce Note 1997 prohibits the import of household CFC-based refrigerators. An extension of the ban to include non-consumer aerosols is under consideration, but this does not address other kinds of ODSs, including HCFCs and AC units containing ODSs.

Duty reductions or exemptions have been introduced for the import of any equipment that will improve the condition of the environment. The DIW, the Ministry of Finance and the National Steering Committee are in charge of the implementation of these incentives. Thai industries seeking support from the government are discouraged from using ODSs and ODS-based industrial projects but will not be granted privileges by the Board of Investment (BOI). (United Nation

Environment Programme and Stockholm Environment Institute, 2000)

At present, there are no other regulations banning the use of ODSs. DIW Order 41/2535 instructs the Factory Control and Inspection Bureau and One-Stop Services Centre not to issue factory licenses to any new factories that intend to use Annex A and B chemicals of the Montreal Protocol in their production process. A similar condition applies to factories seeking a license to expand their existing facilities, if the expansion would result in an increased use of Annex A and B chemicals.

Environmental fiscal reform, referring to a set of instruments, charges, fees, taxes, and subsidies as well as to emission trading, has the potential to make a significant contribution to the implementation of green economy strategies.

The government is now considering further interrelated economic regulations and incentives, such as:

- Regulations requiring a deposit-refund system;
- Emission charges applied to waste generation;
- Incentives for industries to recycle their materials;
- Higher taxation on water-intensive and toxic-intensive businesses;
- Higher taxation on old automobiles; and
- Lower taxation on environment-friendly products.

Lower taxation on environment-friendly products is related to the law and regulation that Thailand needs to achieve its goal to increase importation of HC-based air conditioning and to reduce the consumption of HCFC-based air conditioning units. At this

point in time the duty rate for both kinds of air conditioning units is still the same.

By looking at Thai laws and regulations in the current situation, this study has found that there are no taxes imposed on natural resource extraction in Thailand. There are no environmental taxes on any products, nor are there any taxes on pollutants and emissions. What is more, there are no charges and fees for environmentally harmful products. Finally, in some countries there are green subsidies or targeted subsidies, but Thailand has none of these.

Labelling is another important issue. Thailand has no regulations requiring the labelling of products and equipment that contain or are made with ODSs or require ODS for their use. The Thai Environmental Institute, with the co-operation of the Thai Industrial Standards Institute, has introduced a green label for certain products which do not contain ODSs, or are made without the use of ODSs, such as refrigerators and aerosol products. Thailand has no requirement for mandatory verification of products which are labelled as not containing or made without ODSs.

Finally, under Thai customs law, portable air conditioning units are classified as air conditioners, purifiers, fans and heaters, AC air conditioning units and air conditioning machines incorporating a refrigerating unit (HS code: 84158310). Based on this classification, the import duty rate for importing a portable air conditioning product into Thailand is 1% and the import VAT rate for importing a portable air conditioner is 7%. There is no difference between the tax rates of ODS-based and HC-based (so-called non-ODS-based) AC units. This is a big barrier to convincing the market to use the new ozone-

friendly AC units instead of ODS-based AC units.

CONCLUSION

Environmental protection is one of the most important concerns around the world today. One particularly crucial global issue is the protection of the ozone layer. Life on earth depends on the protection provided by ozone in the stratosphere, which screens harmful ultraviolet (UV) solar radiation from the sun.

Environmental law, environmental tax law and customs law have direct effects on the protection of the environment. By the help of environmental law and environmental tax law, countries can control production and importation of ODSs. By the coordination between environmental tax law and customs law it is possible to encourage the use of ODS alternatives and consequently to phase down and then phase out all of ODSs.

In Thailand there are some regulations and guidelines to control ODSs, but Thailand does not have environmental tax laws to prohibit and discourage manufacturers and importers from production and importation of ODSs and ODS-based equipment. Environmental tax laws can help a country like Thailand to increase its revenue. Both environmental taxes and pollution taxes, or environmentally-related taxes, are raised on polluting tax bases. They highlight inefficiencies in abatement and opportunities for technological progress by putting a positive price on pollution, and thus raising awareness and sharing responsibility.

This study has found that Thailand can achieve its obligations under the Montreal Protocol with the help of environmental tax law and its coordination with the customs act. Cooperation among enforcement authorities

at the national and regional level also plays a very important role in dealing with the implementation of the Montreal Protocol, which is linked to climate change projects.

RECOMMENDATIONS

This study has found that the most important obligation of Thailand under the Montreal Protocol is the phase out of the ODSs by 2017.

It has been suggested that Thailand should take immediate action to ratify the environmental tax law to help the country to achieve its obligations under the Montreal Protocol. Although the ODS alternatives themselves are not usually more expensive than the ODS refrigerants, in order to change the gas the equipment must be retrofitted or sometimes completely replaced. Therefore, this issue can be solved only with the support of the environmental taxes which Thailand could apply for the production and importation of ODS-based AC units. At the same time, with the help of customs tariffs and taxes on the importation of ODSs, as well as with the collection of environmental charges and fees or enforcement of different kinds of levy systems for the production and importation of ODS-based AC units, this issue could be solved. Thus, the incentive for a continued use of the alternatives is a clear solution and will remain so until all the ODS-based equipment is finally replaced with new technologies using ozone-friendly alternatives.

The global consumption of ODSs has been reduced by some 98% since countries started taking action under the Montreal Protocol. As a result, the atmospheric concentration of the most aggressive types of ODSs is falling and the ozone layer is showing signs of recovery.

Nevertheless, it is not expected to recover fully before the second half of this century. (Europaeu, 2015)

Much remains to be done in the transition time to ensure the continued recovery of the ozone layer and to reduce the impact of ODSs on climate change. Actions needed are:

- Ensuring that the existing restrictions on ODSs are properly implemented and the worldwide use of ODSs continues to be reduced;
- Ensuring that ODSs are replaced with climate-friendly alternatives;
- Recovering ODSs from existing unwanted AC equipment; and
- Preventing illegal trade in ODSs.

In Thailand there is an important need for integration between different stakeholders (public and private) to prevent jurisdiction conflicts. As a lot of public and private sectors are involved to control ODSs in Thailand, the best example for Thailand to follow is Australia because the coordination between different authorities in Australia is notably practicable. It should be completely clear and obvious in the environmental tax law who is the tax payer, what is the tax base and how much is the tax rate, which authority can collect this defined tax, and in the case of any illegal trade, consumption and importation of ODSs or ODS-based AC units, which law and court has the legal right to judge the case. All these clarifications should be included in the environmental tax law of the country, which can then be the main source for traders and producers to know how to do businesses according to this law.

As a final conclusion, Thailand will achieve its obligation under the Montreal Protocol by the help of law, specifically environmental tax law and at the same time by changes in customs

tariff rates and the coordination between environmental authorities and customs authorities. Controlling ODS-based AC units is extremely important at the present time. If Thailand cannot control importation and production of ODS-based AC units, in the future the country will face a serious problem: smuggling of ODSs because of the market's demand for existing ODS-based AC units which are used all over the country and for the recharge of which they need gas which is ODS-based. This demand of the market will increase the risk of smuggling.

During this process, Thailand must consider the objectives of the ASEAN and take them into consideration while also achieving its own targets and goals. Free trade among the ASEAN countries will be possible if all of them reach their obligations under all of the international agreements and treaties they have signed.

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