



## **STUDY REPORT**

### **Chrysotile Asbestos in Vietnam**

#### **ACTIVITY CODE:**

**“EU -11: Support to Vietnamese industry to upgrade its production methods to adjust to the EU’s technical regulations and standards in the area of chemical safety.”**

**Version: Final Draft**

**Ha Noi, (11/27/2014)**

*Prepared by: Mr. Craig BOLJKOVAC, MUTRAP III  
International expert, in cooperation with:*

*Mr. Tran Quang Tung, PMU expert 3*

This document has been prepared with financial assistance from the Commission of the European Union. The views expressed herein are those of the author and therefore in no way reflect the official opinion of the Commission nor the Ministry of Industry and Trade

## Table of Contents

Executive Summary .....	4
1. Introduction .....	5
2. Background .....	7
3. Asbestos Mining in Vietnam .....	11
4. Import/Export of Chrysotile Asbestos to Vietnam and Use .....	11
Export of CA-containing products .....	12
5. Current Laws and Policies in place in Vietnam governing Chrysotile Asbestos throughout its Life Cycle.....	13
6. Health and Environment-related Concerns regarding Chrysotile Asbestos .....	15
International Situation .....	15
Situation in Vietnam.....	17
7. International Action on Chrysotile Asbestos.....	18
European Union.....	18
International Labour Organization (ILO) and World Health Organization (WHO) .....	18
8. Overview of key country obligations and commitments for operationalizing and meeting the requirements of the Rotterdam Convention .....	20
Overview of the Convention .....	20
Key provisions of the Convention:.....	21
PIC Procedure: .....	21
Decision Guidance Documents (DGDs) .....	23
Import responses (Article 10).....	23
PIC Circular (Articles 10 and 11).....	23
Article 10 of the Convention: further information requirements related to the PIC Procedure ...	24
Exporting Party Responsibilities for Annex III Chemicals .....	24
Information Exchange on all relevant chemicals (beyond Annex III) .....	25
Information to accompany export (for all chemicals addressed by the Rotterdam Convention) ..	25
Role of the Secretariat/Technical Assistance .....	26
For further information on the Convention: .....	28
The Case of Chrysotile Asbestos:.....	32
Pre-Rotterdam Convention: The London Guidelines Period .....	32
Under the Rotterdam Convention.....	32
9. Alternatives and Costs.....	36
Roof Sheet Production.....	36

Asbestos in Vehicle Brakes:.....	38
10. The legacy of asbestos-containing building materials and other asbestos-containing wastes: their Environmentally Sound Management (ESM) and associated economic costs for Vietnam .....	38
11. Overall cost-benefit summary .....	39
12. Regulatory Impact Statement: a Tool for Decision-Making and Analysis.....	40
13. Advantages/Disadvantages of Vietnam consenting to listing of Chrysotile .....	42
Advantages: .....	42
Disadvantages:.....	44
14. Recommendations .....	45
References .....	49

## Executive Summary

This study report has been prepared by an International Consultant for Vinachemia, the Vietnamese National Chemicals Agency (located in the Ministry of Industry and Trade). This report is aimed at assisting the Government of Vietnam in two ways: to help with decision-making regarding whether Vietnam will support listing of chrysotile asbestos – a chemical of international concern – on Annex III of the Rotterdam Convention as the next Conference of the Parties meets in May, 2015 to consider this issue; and, to assist Vietnam with identifying its needs for capacity building, technical assistance and development assistance in order to end its dependence on imports of chrysotile asbestos.

Vietnam has been using chrysotile asbestos in manufacturing since 1963. There is currently no commercial mining of asbestos; therefore all asbestos is imported. Some 39 industrial facilities manufacture roof sheeting using chrysotile asbestos, representing approximately 90% of all imports; the remaining imports (although data is not presently available) appear to be used exclusively for replacement of brake linings in vehicles.

Vietnam has, along with several other Parties to the Rotterdam Convention, blocked listing of chrysotile asbestos on Annex III of the Convention. While such a listing does not constitute an international “ban” on the chemical, it has been cited by some to be a technical barrier to trade. Nevertheless, the majority of Parties to the Convention support such a listing (citing a wide variety of scientific evidence that is partly summarized in this study report). Vietnam, therefore, has potentially risked its environmental and health protection reputation by its continued blockage of the listing of chrysotile asbestos. Recently, Vinachemia has indicated that there may be a change of government position going into the seventh Conference of the Parties of the Rotterdam Convention, and that Vietnam may support listing. In addition, Vietnam has announced (in an August, 2014 government directive) that there is an intention to phase out the use of chrysotile asbestos by 2020.

Nevertheless, even with the support of Vietnam for listing chrysotile asbestos, financial, technical, capacity building and development assistance are all needed to ensure the 2020 phaseout goal is reached. This study report outlines a number of key recommendations that, if implemented, can assist the Government of Vietnam in general, and Vinachemia in particular, with creating a viable “Road Map” to 2020. Pilot projects to test alternatives to chrysotile asbestos, capacity building to strengthen health surveillance, and the further training of workers are several examples of such activities.

In addition, other general recommendations related to strengthening capacities in Vietnam for implementation of international agreements, particularly the Rotterdam Convention, the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), addressing chemicals in products and other key activities are also made. Several of these recommendations are of direct relevance to the European Trade Policy and Investment Support Project (EU-MUTRAP), which funded this study report.

## 1. Introduction

This study report has been developed as part of the European Trade Policy and Investment Support Project (EU-MUTRAP), which is executed by the Ministry of Industry and Trade of the Socialist Republic of Vietnam in partnership with the European Commission ([www.mutrap.org.vn](http://www.mutrap.org.vn)). Succeeding to three previous MUTRAP projects, the Overall Objective of EU-MUTRAP IV is to further Vietnam's integration into the global, regional (ASEAN) and sub-regional trading systems, and to enhance the EU-Vietnam trade and investment relations, as well as to maximize the benefits from the country's economic development for inclusive growth and poverty reduction. The purpose of the Project is to support the Ministry of Industry and Trade (MOIT) in facilitating sustainable international trade and investment through improved capacity for policy making, policy consultation, and the negotiation and implementation of related commitments, particularly vis-à-vis the European Union (EU).

This study report specifically addresses the continued use of chrysotile asbestos in Vietnam, in response to an ongoing dialogue at the international level at successive Conferences of the Parties of the Rotterdam Convention. The Vietnamese authorities responsible for protection of health and trade in hazardous substances lack sufficient information (in their view) to develop an informed position regarding proposals to list chrysotile asbestos in Annex III of the Rotterdam Convention. Vinachemia, the agency (within the Ministry of Industry and Trade) responsible for industrial chemicals in Vietnam, have therefore requested technical assistance to clearly identify Viet Nam's options and interests with respect to subjecting chrysotile asbestos to the Prior Informed Consent Procedure under Annex III of the Rotterdam Convention.

This study report will explore the options for Vietnam as the government once again considers whether or not it will support the inclusion of chrysotile asbestos on Annex III when the issue comes up for discussion at the seventh Conference of the Parties of the Convention, scheduled for May, 2015. Recent indications from Vinachemia, possibly related (in part) to the work undertaken for this project, suggest that the Government of Vietnam will support listing of chrysotile asbestos.

This study report therefore addresses the following:

- Briefly reviews the economic importance of chrysotile asbestos in the economy of Viet Nam;
- Undertakes a basic cost/benefit analysis of a ban of trade in, and use, of chrysotile asbestos for the economy as a whole and for major industries/enterprises; and for the health sector;
- Explains the functioning of the Rotterdam Convention and how to manage the Annex III procedures with respect to hazardous substances;

- Undertakes an analysis of the advantages/disadvantages for Viet Nam's image of its decision whether or not to add chrysotile asbestos to Annex III of the Rotterdam Convention; and
- Makes suggestions regarding the regulatory impact analysis of controls on asbestos and asbestos products in Vietnam.

The study report can, once accepted by the Vietnamese government, provide input to the decision-making process leading to the taking of a national position at COP 7 of the Rotterdam Convention and as it develops a "Road Map" towards eliminating the use of chrysotile asbestos by 2020.

## 2. Background

The Rotterdam Convention was designed to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm and to contribute to their environmentally sound use. Several unsuccessful attempts to add chrysotile asbestos to Annex III of the Convention, which would trigger the rigorous exchange of information from exporting to importing Parties (although, despite misunderstandings to the contrary, would *not* result in the *banning* of chrysotile at the international level) have taken place at Conferences of the Parties. Vietnam was one of a number of countries that did not previously support the inclusion of chrysotile in Annex III. This paper will explore the options for Vietnam as the government once again considers whether or not it will support the inclusion of chrysotile on Annex III when the issue comes up for discussion at the seventh Conference of the Parties of the Convention, scheduled for May, 2015 (see the “Introduction” section, above, for a recent indication of possible support for the listing of chrysotile by the Government of Vietnam).

## **Asbestos – the “Wonder Fibre” (From EU, 2012)**

The word “asbestos” originates from the Greek language, and means “imperishable” or “inextinguishable”.

Asbestos has advantageous properties for uses in products, including:

- resistance to heat and corrosion (it has a high melting point of more than 1200 °C);
- resistance to acids (crocidolite) and bases (chrysotile);
- resistance to decomposition;
- has a very low capacity for the conduction of electricity;
- high elasticity and tensile strength;
- high resistance to ageing.

There are two classes of asbestos: serpentine and amphibole:

- Chrysotile asbestos (also known as “white” asbestos), which has curly fibres, is the only type of asbestos in the serpentine class;
- Amphibole asbestos fibres are straight and needle shaped. The most common commercially used types of asbestos from this class include amosite (“brown” asbestos), crocidolite (“blue” asbestos) and tremolite asbestos.



Vietnam has used chrysotile asbestos in the manufacturing sector since 1963. Asbestos is no longer mined in Vietnam. Therefore the entire supply is currently imported. Today asbestos is primarily used as an input to the manufacture of roof sheets, with a minor percentage of imports being used in the manufacture of brake pads for vehicles. Domestic information on the effects of chrysotile asbestos use among workers and the general population is scarce to non-existent. Several studies have offered inconclusive results.

At the international level, clear evidence exists regarding the hazards/risks posed by chrysotile asbestos. Such information has been summarized in a variety of publications, and was taken into account as part of a series of decisions of the Chemicals Review Committee (CRC) of the Rotterdam Convention when it recommended the inclusion of chrysotile asbestos in Annex III of the Rotterdam Convention for consideration by the Conferences of the Parties at successive meetings.

Within Vietnam, chrysotile asbestos-containing roof sheets are an inexpensive product currently in widespread use. According to the industry association of roof sheet producers, costs of alternatives to such roof sheets would constitute a prohibitive barrier to the poorest Vietnamese, who depend on inexpensive building materials as a tool for their continued economic improvement and growth.

Vietnam is currently in negotiations with the European Union for a comprehensive Free Trade Agreement. The EU is currently Vietnam's number one export recipient, and number two trading partner (behind the People's Republic of China). Therefore, the potential benefit to the economy of Vietnam, its continued economic growth, and to its overall development, should the negotiations successfully result in a Free Trade Agreement, are substantial.

The EU, for its part, considers issues such as the continued use of chrysotile asbestos in Vietnam as a key concern. Acceptance of a broad range of imports (to the EU) from Vietnam may be constricted by a continued image, fueled by the long-term use of chrysotile asbestos, of Vietnam as a country that is not comprehensively addressing important issues of environment and health protection. Therefore, the issue of chrysotile asbestos is linked, at some levels, with the prospects for development through the Vietnam-EU Free Trade Agreement negotiations.

Conversely, several countries (most of whom continue to mine and export chrysotile asbestos) have joined with Vietnam at Conferences of the Parties of the Rotterdam Convention to oppose listing of chrysotile asbestos in Annex III. Any change of position of Vietnam at the May, 2015 Conference of the Parties would also have to be assessed in light of relations with these countries.

This study report attempts to give an overview of the complex issues raised above, with recommendations for options for the Vietnam government to consider as it formulates its position for the May, 2015 Conference of the Parties.

### **EU and Vietnam: Some Key Facts**

- The EU is Vietnam's largest export market, with 21 billion euros representing 19% of Vietnam's total exports.
- Vietnam's exports to the EU increased by 28% from 2012 to 2013
- EU and Member States development assistance is increasing, and will amount to 400 million euros in the coming six years
- The EU-Vietnam Partnership and Cooperation Agreement in June 2012 facilitates cooperation (beyond the traditional areas of trade and development) on issues ranging from environment and climate change to migration, from science and technology to security and crisis management
- Ongoing negotiations for an EU-Vietnam Free Trade Agreement are expected to be completed in 2015

### 3. Asbestos Mining in Vietnam

Vietnam has a limited history of asbestos mining. In the past, amphibole asbestos was mainly mined. Some low-quality chrysotile asbestos was also mined, mainly as a byproduct of the pursuit of other minerals. At present, some low-quality asbestos is mined as a byproduct of the production of molten phosphate fertilizer (ncbi paper section 3.4). It is not, however, used commercially.

It can therefore be concluded that primary asbestos mining is no longer takes place in Vietnam. Therefore, Vietnam is wholly dependent on imports for its supply of chrysotile asbestos. Thus, any potential transition to using non-asbestos alternatives is greatly simplified, since there will be no impact on employment in the primary mining sector.

### 4. Import/Export of Chrysotile Asbestos to Vietnam<sup>1</sup> and Use

Data collection for asbestos imports in Vietnam began in 1992 at 10,000 metric tonnes (tons hereafter), increased to 60,000+ tons by the year 2000, and was sustained at about 60,000–70,000 tons after 2005 (the historical peak was 75,100 tons in 2007).

More recently, according to statistics received from the Vietnam Chemicals Agency, in 2012 Vietnam imported about 64,000 tons of chrysotile asbestos. In 2013 some 40-50,000 tons was imported. These imports were designated to be used in the manufacture of roofing. Statistics regarding chrysotile asbestos imports designated for use in the manufacture of vehicular brakes (a relatively minor use in Vietnam) have not been determined.

Major countries which export chrysotile asbestos to Vietnam are: Russia, Brazil, China, Kazakhstan and Zimbabwe. Canada and the United States have also historically supplied Vietnam with raw asbestos.

In 2013, Vietnam had thirty-nine plants producing approximately 90 million square metres of roof sheets.

In recent years, the country has used only chrysotile asbestos; more than 90% is used to manufacture asbestos-cement (AC) roof sheets, and the remainder is used to manufacture car brakes and thermal insulation. The country also imports many asbestos-containing products (ACPs).

Asbestos has been utilized for roofing production in Vietnam since 1963.

---

<sup>1</sup> All data for this section has been provided and or confirmed by Vinachemia.

Until 1980, all three main commercial types of asbestos (amosite asbestos, crocidolite asbestos and chrysotile asbestos) were used in Vietnam primarily in production of roofing, insulation panels, and other products requiring protection from corrosion. The use of amosite and crocidolite asbestos ceased in Vietnam in 2007.

In recent years, Vietnam has used only chrysotile asbestos; more than 90% is used to manufacture asbestos-cement (AC) roof sheets, and the remainder is used to manufacture car brakes and thermal insulation. The country also apparently imports many asbestos-containing products (ACPs) (but data was not available on this issue at time of publication).

### **Export of CA-containing products**

The Vietnam National Roof Sheet Association (the industry association that comprises the vast majority of roof sheet manufacturers using chrysotile asbestos in the country) has indicated that a small percentage asbestos-containing roof sheets (some 8%) are exported to African countries annually. Data on exports to other countries (for example, to neighbouring countries such as Cambodia, China and Laos, where there are extensive trade links) is not presently available

## 5. Current Laws and Policies in place in Vietnam governing Chrysotile Asbestos throughout its Life Cycle

The government of Vietnam has recognized the hazardous nature of asbestos. The following is an overview of existing legal instruments in Vietnam governing the use and import of asbestos in all its forms (with a particular focus on chrysotile asbestos). The most recent (August, 2014) decision of the Prime Minister's office (see below) reconfirms the continued role of chrysotile asbestos (at least in the short-term) in the manufacture of roof sheets (this is by far the current primary use for chrysotile asbestos imports into Vietnam), but suggests a phase-out date of 2020 for all uses of chrysotile. The August, 2014 decision is the latest in a relatively long history of formal action on asbestos (in all its forms) taken by the Vietnamese government.

Decision No. 1469 / QD-TTg dated 08/22/2014 (Office of the Prime Minister) approves a master plan on development of building materials until 2020 and provides further direction on development to the year 2030. Key points within the decision include:

- This decision comprises part of the “Master Plan” for the development of construction materials between the present time and the year 2020;
- The manufacture of roofing materials is specifically addressed;
- A reconfirmation that all type of asbestos (with the exception of chrysotile) are banned from use in Vietnam;
- A production cap of approximately 106 million square meters per year of chrysotile asbestos-containing roofing materials is put into place, effective between the present time and 2020;
- No new investments or expansions of current investments at facilities using chrysotile asbestos will be permitted. The plan also calls for the gradual conversion of existing plants using fibers, replacing them with non-asbestos alternatives;
- Guidance is given regarding the development path of the roofing industry (away from using chrysotile asbestos) between the present time and 2030; and
- Strengthening the existing health and safety of workers and users, and environmental protection regarding chrysotile asbestos-containing roof sheets, in a continually strengthened manner, is also mandated.

Other relevant legal instruments addressing this issue in Vietnam include:

- Decision No. 115/2001/QD-TTG (Office of the Prime Minister) which stated that asbestos would be banned in 2004;
- Decision Number 133/2004/QD-TTG (Office of the Prime Minister) amended the ban to allow for the continued use of chrysotile asbestos, with strict monitoring of the working environment and workers' health;

- Decision Number 121/2008/QĐ-TTĐ (Office of the Prime Minister), the use of chrysotile was permitted until 2020 in the manufacturing of roof sheets, under strict monitoring of the working environment and workers' health;
- Circular No. 11/2011/TT-BXD 08.30.2011 (Ministry of Construction) addressing national regulations for construction materials (including chrysotile asbestos-containing materials);
- Circular No. 1529/1998-TTLT/BKHCMNT-BXD 10.17.1998 (Ministry of Science, Technology and Environment and the Ministry of Construction) on directions for ensuring environmental protection in the use of asbestos in the manufacturing of construction materials;
- Circular No. 19/2011/TT-BYT dated 06.06.2011 on guidance for the management of occupational health, employee health and occupational diseases, which addresses environmental management and health of workers exposed to asbestos;
- Decree No. 26/2011/ND-CP of the Government amending a number of articles of Decree No. 108/2008/ND-CP addressing chrysotile asbestos on a "List of chemicals that require a declaration";

These decisions were accompanied by the issuance of other legal documents by the respective ministries of Health, Labor, Construction, and Science and Technology. The Vietnam General Confederation of Labor also issued circulars, guidelines and regulations, to minimize the health risks of workers, and improve the working environment.

The Vietnamese government, particularly Vinachemia, has indicated that international assistance regarding the development of the details of a "road map" with the goal of terminating the use of all forms of asbestos by 2020 would be welcomed (see "Recommendations" section).

## 6. Health and Environment-related Concerns regarding Chrysotile Asbestos

### International Situation

While there is a lack of clear evidence associating exposure to chrysotile asbestos with negative health effects in Vietnam, at the international level the evidence appears to be more compelling. Nevertheless, there are differing conclusions in the scientific literature.

Studies that suggest an association between asbestos and lung cancer (Gloyne, 1935; Lynch & Smith, 1935, both cited by IPCS, 1986) date back to as early as 1935. These initial studies were followed by numerous others that came to similar conclusions over the ensuing twenty years. IPCS cites that the first epidemiological studies that confirmed this association were published in 1955 (Doll, 1955, cited by IPCS 1986). These initial studies have been followed by over 30 cohort studies (on various forms of asbestos), which have been carried out in industrial populations in several countries. The majority, but not all, have shown an excess lung cancer risk (IPCS 1986).

The international scientific community appears to have therefore come to a general consensus that all types of asbestos fibres – including chrysotile fibres – are carcinogenic (Royal Society of Canada, 1996). Chrysotile asbestos, in fact, has been classified as a “known human carcinogen” (IARC, 1987). Lung cancer, in particular, has been associated with exposure (depending on the dose) to chrysotile asbestos, as has mesothelioma and asbestosis when fibres have been inhaled (IPCS, 1998). However, lung cancer appears to be the most prevalent disease causing death among workers (NICNAS, 1999). Cancer of the larynx has also been associated with asbestos exposure, as have other types of cancer (European Commission, 2012). Chrysotile may, according to some studies, be more weakly associated than amphibole asbestos in causing asbestosis (Becklake, 1991). Several other studies indicate, however, no discernable difference in the occurrence of asbestos-related diseases among the different kinds of asbestos that have been in use (US EPA, 1989; NICNAS, 1999).

The risk of lung cancer also, according to some studies, appears to be elevated in smokers who are exposed to asbestos (the so-called “synergistic” effect) (IPCS, 1986).

The other challenging aspect of determining whether diseases are caused by exposure to asbestos is the so-called “latency” period (“delay”) between the point in time when a person is exposed to asbestos and when symptoms of disease appear. Some sources (EC, 2012) estimate that, for asbestos, this latency period can be as long as thirty-five years. This makes the tracking and health surveillance of workers, for example, extremely difficult. Once the onset of an asbestos-related disease occurs, should a link to exposure to asbestos many decades earlier can be proved, often the enterprise where the worker in question was exposed has long since ceased to exist.

### **Major Diseases Associated with Asbestos Exposure**

*Asbestosis:* A chronic medical condition causing inflammation and scarring of the functional tissue of the lungs caused by the inhalation and retention of asbestos fibres.

*Mesothelioma:* A rare type of cancer that affects the tissue that provides a protective lining around organs, particularly the lungs (the “pleura”); but also the linings of the abdominal cavity, heart, and other vital organs.

*Lung Cancer:* This type of cancer is the most common cause of death, with some 1.56 million deaths each year (as of 2012) (WHO, 2014). While tobacco use is the main cause of lung cancer, asbestos exposure is also cited as a significant factor.



## Situation in Vietnam

As stated above, the situation in Vietnam regarding the health status of persons who may have been exposed to asbestos is not as clear as evidence at the international level suggests. The roof sheet industry and Vinachemia both cite a lack of proper, peer-reviewed studies in Vietnam, and a lack of cases of asbestos-related diseases despite years of monitoring of workers (Personal communication, August 2013).

A brief survey of the available studies and/or reports does however give some indication of the current situation. Various presentations given by representatives of the Vietnamese government at international meetings have included the following (unverified) information regarding health surveillance-related challenges:

- Less than 20% of asbestos-using factories control asbestos dust at workplace;
- Some monitoring of levels of asbestos in air in the workplace indicates levels that are over national standards by some 30-40%;
- Facilities using asbestos tend to be privately owned or “joint-stock” (public/private) companies, which presents a greater challenge for ensuring enforcement and compliance to national standards than publically-owned companies;
- Human resource for procuring and analyzing asbestos samples are very limited (only two relevant Institutes and Construction Occupational Health Centers exist in Vietnam);
- Health surveillance of workers is limited (some estimates indicate only 50% of manufacturers carry out such activities; covering some 50-85% of target workers);
- In terms of specific measures, such as periodic chest x-rays (which can reveal asbestos-related diseases) of higher-risk workers, it has been estimated that only 5-8% of such workers have regular x-rays.

One presentation indicated the following systemic challenges regarding the use of and exposure to asbestos in Vietnam:

- Technology is out of date;
- Low awareness on asbestos hazards of employers and employees;
- Weak labour inspectorate;
- Health and environmental surveillance capacity is weak;
- No database on disposal of asbestos.

In terms of exposure to the general public, some 8-10% of asbestos imported into Vietnam is used for brake pad linings. While Vietnamese data on this issue does not appear to exist;

studies have indicated elevated (above regular background) levels of chrysotile asbestos at intersections in the UK when asbestos was used in brake pads in that country (Jaffrey, 1990 cited by NICNAS, 1999). Nevertheless, normal use of brakes have not generally been shown to produce high fibre release to the general environment (Williams and Muhlbaier, 1982). The greatest concern, however, lies with exposure to the person removing brakes or installing new brakes or through the manipulation of the pads with compressed air blow-out, wire brushing, or other such methods which can release airborne asbestos (Lemen, 2004).

## **7. International Action on Chrysotile Asbestos**

### **European Union**

The European Union's Directive 1999/77/EC bans the placing on the market and use of products containing asbestos with effect from 2005. And the Directive 2009/148/EC prohibits all activities in which workers are exposed to asbestos fibres in asbestos extraction or production/processing of asbestos products. With minor exceptions, all uses of asbestos in European Union member states is banned.

The "Dresden Declaration on the Protection of Workers against Asbestos" of the European Asbestos Conference 2003, called for a worldwide ban of asbestos. In relation to the manufacture and use of asbestos products, this aim has been achieved in all Member States.

Health care costs for asbestos-related diseases, as a legacy of asbestos exposure in the European Union, are estimated to be in the order of one billion Euros per year.

The European Commission and EU member states have also been major advocates for the addition of chrysotile asbestos to Annex III of the Rotterdam Convention (see below).

### **International Labour Organization (ILO) and World Health Organization (WHO)**

The ILO Convention Safety in the Use of Asbestos (162) encourages countries to find safer and/or safe substitutes for asbestos; prohibits the use of crocidolite asbestos; and addresses the presence of asbestos dust in the workplace. ILO has also passed several other instruments which address, at least in part, asbestos issues.

WHO has developed, through the International Agency on Research for Cancer (IARC) a series of monographs that undertake assessments as to the weight of the evidence indicating whether or not a substance is carcinogenic. With regard to chrysotile asbestos, there was determined to be no minimum threshold of exposure to asbestos fibres where there was not a risk of cancer; therefore chrysotile asbestos exposure was determined to increase risk of cancer, and less harmful alternatives are recommended to be used whenever possible.

The International Programme on Chemical Safety (IPCS) is a joint programme of UNEP, WHO and ILO. IPCS works to establish the scientific basis for the sound management of chemicals, and to strengthen national capabilities and capacities for chemical safety. One key tool developed by IPCS are the “Environmental Health Criteria” series of monographs. The EHCs reflect the collective views of an international group of experts, who have been tasked with weighing the evidence regarding the risks posed by chemicals of concern. Monograph No. 203 (published in 1998) addresses chrysotile asbestos. The conclusions published in this monograph are reflected in the health effects section (Section 6) of this report.

## **8. Overview of key country obligations and commitments for operationalizing and meeting the requirements of the Rotterdam Convention**

This section provides an overview of the Rotterdam Convention, how it works and what frameworks for assistance exist for countries that require capacity building.

### **Overview of the Convention:**

The Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade (hereinafter “the Convention”) was adopted on 10 September 1998 by a Conference of Plenipotentiaries in Rotterdam, the Netherlands. The Convention entered into force on 24 February 2004.

The scope of the substances that the Convention addresses includes (in the context of international chemicals management):

- Pesticides and industrial chemicals banned or severely restricted to protect human health or the environment;
- Severely hazardous pesticide formulations (SHPF) - which cause problems under conditions of use in developing countries or countries with economies in transition

The overall objective of the Convention is to promote shared responsibility and cooperative efforts among Parties in the international trade of certain hazardous chemicals in order to protect human health and the environment from potential harm; and to contribute to their environmentally sound use.

The Convention provides an early warning of potentially hazardous chemicals, provides the basis for decisions regarding of future imports of chemicals (PIC procedure); and helps to enforce those import decisions.

## Key provisions of the Convention:

Key provisions include:

- The “Prior Informed Consent (PIC)” procedure - Provides for a national decision making process on import of hazardous chemicals in Annex III and attempts to ensure compliance with these decisions by exporting Parties
- Information exchange - the exchange of information on a broad range of potentially hazardous chemicals (chemicals in addition to those that are present on Annex III)

## PIC Procedure:

Listing a substance on Annex III triggers the “Prior Informed Consent” provisions (the “PIC Procedure”) under the Convention. The process to list a substance involves several steps. A minimum of two countries, each from different UN regions, must formally notify the Convention Secretariat that they have banned or severely restricted a certain chemical. Once two such notifications are received, the Secretariat verifies the information, and informs Parties (via the PIC “Circular”) of the bans/restrictions, and refers the chemical to the Chemical Review Committee (CRC) for evaluation and development of a recommendation to the Conference of the Parties whether the substance should be added to Annex III.

Once the CRC makes a positive recommendation to the COP about a chemical, the following steps take place:

### STEP 1

- Decision to make a chemical subject to the PIC and list in Annex III (COP)
- Circulation of a **decision guidance document** to all parties (Secretariat)

### STEP 2

- **Import responses** regarding future import of each PIC chemical (Parties)
- Circulation of import responses to all Parties (Secretariat) using the **PIC Circular**

### STEP 3

- Follow up takes place by importing Parties (in accordance with their responsibilities)
- Follow up takes place by exporting Parties (in accordance with their responsibilities)

The PIC procedure generates three key types of documents (as mentioned in the steps above):

- the Decision Guidance Document (DGD);
- Import Responses; and
- the PIC circular.

### **The Chemical Review Committee (CRC) (from [www.pic.int](http://www.pic.int)):**

The Chemical Review Committee (CRC) is a subsidiary body of the Rotterdam Convention established to review chemicals and pesticide formulations according to the criteria set out by the Convention in Annexes II and IV respectively and make recommendations to the Conference of the Parties for listing such chemicals in Annex III.

How does CRC operate?

One of the fundamental processes in the operation of the Rotterdam Convention is that a Party, when it has adopted a final regulatory action to ban or severely restrict a chemical notifies the Secretariat of that action. The Convention specifies both the contents and the time limit for such notifications. The Secretariat will verify the notifications and inform other Parties about the notifications received. When the Secretariat has received notifications from two parties in two different PIC regions regarding a specific chemical, it shall forward the notifications to the Chemical Review Committee in order for it to review and consider recommending the chemical for inclusion in Annex III of the Convention.

Additionally, any Party that is a developing country or country with an economy in transition that is experiencing problems due to the impact to human health or the environment caused by a severely hazardous pesticide formulation under conditions of use in its territory, may propose to the Secretariat the listing of the severely hazardous pesticide formulation in Annex III of the Convention. In its Annex IV, the Convention specifies the documentation required from a proposing Party, the information to be collected by the Secretariat and the criteria for listing the severely hazardous pesticide formulation. The Secretariat will verify the proposals, inform other Parties about the proposals received and collect additional information as specified by the Convention. Subsequently, the Secretariat forwards the proposal to the Chemical Review Committee in order for it to review and consider recommending the pesticide formulation for inclusion in Annex III of the Convention.

## Decision Guidance Documents (DGDs)

DGDs describe the reasons for national actions to ban or severely restrict the chemical that were the basis for the chemical being listed in Annex III. They list what uses have been prohibited and what if any uses remain in the notifying Parties as well as information on alternatives, and contain basic information about the chemical including a summary of the principal toxicological and eco-toxicological properties. Further sources of information are often referenced, including evaluations from internationally recognized sources (e.g. WHO).

Draft DGDs are developed under the guidance and direction of the Chemical Review Committee for consideration by the Conference of the Parties.

## Import responses (Article 10)

Import responses are issued by Parties, following a format provided by the Secretariat.

Responses consist of either:

- a final decision
  - to consent to import
  - not to consent to import
  - to consent subject to specified conditions

Or:

- an interim response, including
  - an interim decision to import or not to import
  - a statement that a final decision is under consideration
  - a request for further information
  - a request for assistance in evaluating the chemical

## PIC Circular (Articles 10 and 11)

The PIC Circular is issued by the Secretariat every six months of the year (in December and June). It is sent to all Designated National Authorities (DNAs) and posted on Convention website. The Circular forms the basis for compliance with import decisions under Article 10 of the Convention.

The Circular provides Parties with a listing of all import decisions (summaries of notifications of regulatory actions to ban or severely restrict a chemical). The information includes:

- the reasons for the ban or severe restriction of a chemical;
- summaries of proposals for severely hazardous pesticide formulations; and
- description of the conditions of use.

The Circular also provides an updated list of Designated National Authorities.

### **Article 10 of the Convention: further information requirements related to the PIC Procedure**

Article 10 of the Convention sets out the obligations of Parties with respect to the future import of chemicals listed in Annex III of the Convention and subject to the PIC procedure. Parties have an ongoing obligation to submit to the Secretariat, as soon as possible and in any event no later than nine months after the date of dispatch of a decision guidance document their import decision (whether a final or interim response) concerning the future import of the chemical. Should a Party change an import decision submitted previously to the Secretariat, the Designated National Authority should submit a revised import response as soon as possible. All import responses submitted by Parties are published in June and December of each calendar year in the PIC Circular.

Under Article 10, importing Parties are to:

- ensure that importers, relevant authorities and (where possible) users are informed of import responses received;
- ensure that import decisions apply uniformly to imports from all exporting countries; and
- ensure that import decisions apply uniformly to any domestic manufacturing of the chemical for domestic use.

### **Exporting Party Responsibilities for Annex III Chemicals**

The text of the Rotterdam Convention captures the responsibilities of exporting Parties:

*Where a chemical that is banned or severely restricted by a Party is exported from its territory, that Party shall provide an export notification to the importing Party. The export notification shall include the information set out in Annex V.*

Under Articles 11 and 13, Parties to the Convention must:

- implement legislative and administrative measures to communicate import decisions within its jurisdiction; and
- take appropriate measures to ensure that exporters comply with import decisions.

Parties must also ensure appropriate labeling and information accompanies exports – improved labeling and accompanying information in line with the Globally Harmonized System of Classification and Labeling of Chemicals (GHS), while the use of Harmonized System Customs Codes linked to work of the World Customs Organization will facilitate



tracking of PIC chemicals listed in Annex III. In addition, each Party shall require that, whenever a code has been assigned to such a chemical, the shipping document for that chemical bears the code when exported.

### **Information Exchange on all relevant chemicals (beyond Annex III)**

The Convention also provides a mechanism for the exchange of information on a broad range of potentially hazardous chemicals (in addition to those that are listed under Annex III). Such information exchange is to be used for *any chemical that is banned or severely restricted by a Party to protect human health or the environment* (Parties are obligated to report such bans/restrictions). Similarly, the provisions also apply to severely hazardous pesticide formulations causing problems under the conditions of use.

Obligations of Parties regarding export notification of such chemicals include:

- To notify the importing Party prior to the first shipment when exporting a chemical that is banned or severely restricted in its territory and thereafter for the first shipment annually. The notification must contain, at a minimum, information specified in Annex V of the Convention.
- The Designated National Authority (DNA) of the *importing Party* can request any information that is outlined in the Annex I of the Convention (“Information Requirements for Notifications Made Pursuant to Article 5”), which gives guidance on the content of notifications. This information will also have been summarized in the PIC Circular.

In addition, under these information exchange provisions, Parties must provide a “Notification of Final Regulatory Action” to ban or severely restrict a chemical. Parties are also obligated to submit for circulation proposals on severely hazardous pesticide formulations causing problems under conditions of use.

### **Information to accompany export (for all chemicals addressed by the Rotterdam Convention)**

Article 13 of the Convention also attempts to ensure that there is adequate labeling of chemicals with regard to human health or environmental risks taking into account international standards (such as the Globally Harmonized System of Classification and Labeling of Chemicals – GHS) and (particularly for Annex III chemicals) Harmonized System codes assigned by the World Customs Organization. Chemicals being shipped should be accompanied by a safety data sheet.

## Role of the Secretariat/Technical Assistance

Article 16 of the Convention states:

*Parties with more advanced programmes for regulating chemicals should provide technical assistance, including training, to other Parties in developing their infrastructure and capacity to manage chemicals throughout their lifecycle.*

Since the conclusion of the negotiations for the Rotterdam Convention, a wide variety of training and capacity building activities have been undertaken to assist countries with implementation. These activities have been delivered as:

- Assistance from the Convention Secretariat;
- Direct bilateral assistance from donor countries (as the Convention text, above, suggests); and
- Assistance from other international organizations, particularly UN entities involved in sound chemicals management activities (for example, FAO, UNEP Chemicals, WHO/IPCS, ILO, etc.)

Funding has been provided by donor countries (which also tend to be countries with more advanced chemical programmes) as direct grants to international organizations or the Secretariat, or through multilateral mechanisms such as the Global Environment Facility (which, while not formally a funding entity for the Rotterdam Convention, has provided related funds through its other chemicals- and wastes-related mandates).

The text box below provides a broad outline of some of the services the Technical Assistance Branch of the combined Secretariat of the Basel, Rotterdam and Stockholm Convention can provide to countries for implementation of the Convention.

## **Technical Assistance Branch Fact Sheet**

**(from the website of the Secretariats of the Basel,  
Rotterdam and Stockholm Conventions)**

The Technical Assistance Branch is responsible for developing and managing the Technical Assistance Programme of the Secretariat of the Basel, Rotterdam and Stockholm conventions in accordance with the relevant mandates provided by the Conferences of the Parties to the three conventions.

The Branch is therefore responsible for the identification of the needs of developing country Parties, and Parties with economies in transition, in implementing their obligations under the Basel, Rotterdam and Stockholm conventions.

As part of the technical assistance programme, the Branch manages the implementation of capacity building and training activities, including workshops, webinars and on-line training, as well as the development of the relevant training tools and materials.

The Branch manages the regional delivery of technical assistance, with a particular focus on supporting the regional centres established under the Basel and Stockholm Conventions, including their selection process, the facilitation of guidance to centres, the promotion of effective collaboration and cooperation among the centres, as well as the processes for reporting and performance evaluation of the centres.

In addition the Branch is also responsible for managing partnerships, especially through identifying and establishing relevant partnerships for the delivery of technical assistance.

<http://synergies.pops.int/Secretariat/Structure/BranchesFactSheets/TechnicalAssistanceBranch/tabid/2734/1anguage/en-GB/Default.aspx>

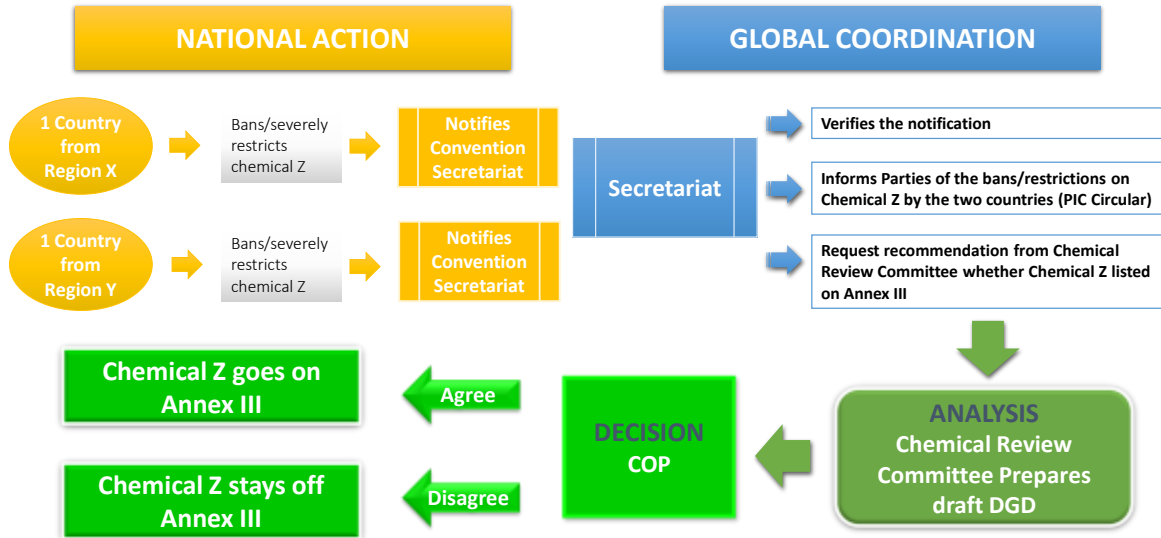
### **For further information on the Convention:**

Rotterdam Convention Website: [www.pic.int](http://www.pic.int) The website contains links to the following helpful publications/tools:

- Overview of the Rotterdam Convention (leaflet)
- Guide on the Development of National Laws to Implement the Rotterdam Convention (publication)
- Guidance to Designated National Authorities (DNAs) on the Operation of the Rotterdam Convention (publication)
- Interactive Training on the Rotterdam Convention (e-learning)
- Guidance on the operation of the Rotterdam Convention (e-tool)

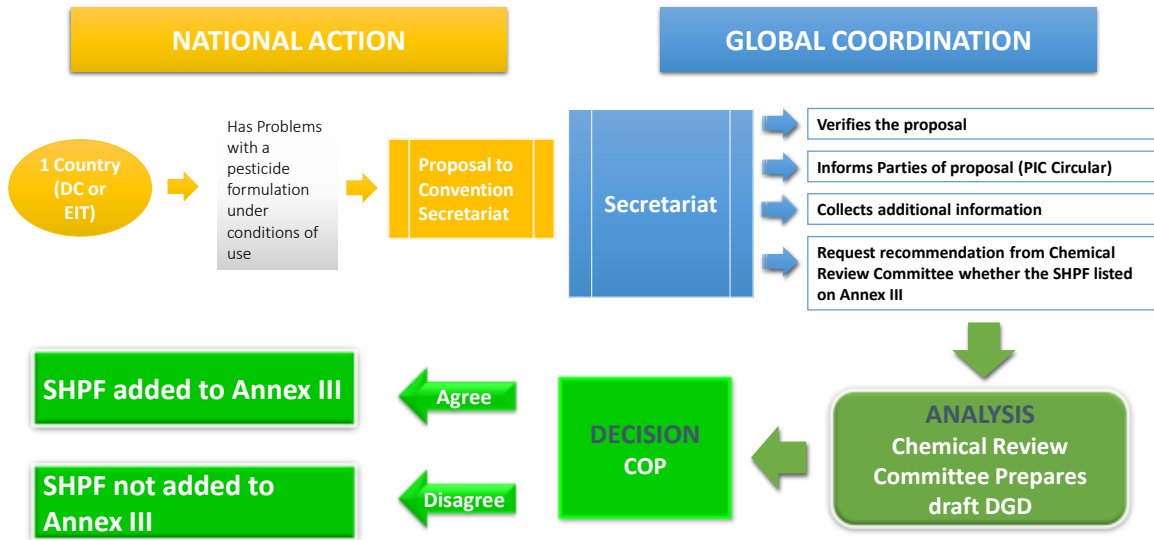
## Addition of a Chemical to Annex III of the Convention

Two countries, each from a different U.N. Region, activate the process

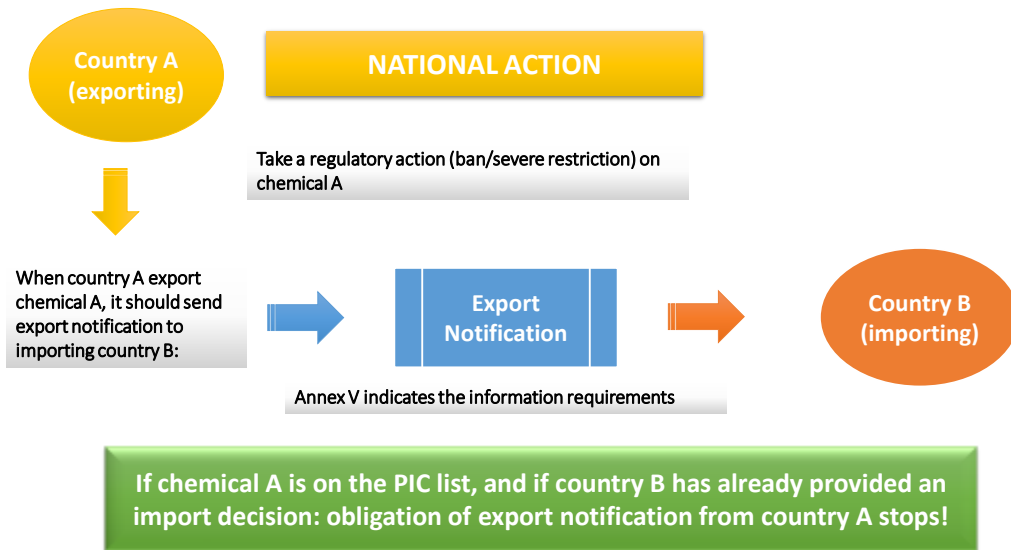


## Adding a Severely Hazardous Pesticide Formulation to Annex III

A single developing or transition country activates the process



## Export Notification



## **The Case of Chrysotile Asbestos:**

This section provides some of the history of the deliberations, at the international level, regarding chrysotile asbestos.

### **Pre-Rotterdam Convention: The London Guidelines Period**

Prior to the entry into force of the Rotterdam Convention (in February, 2004) there was a voluntary mechanism that incorporated the Prior Informed Consent Procedure (which was later codified in the Rotterdam Convention). The London Guidelines for the Exchange of Information on Chemicals in International Trade were adopted in 1987 by the UNEP Governing Council.

Under the London Guidelines, there was no equivalent process as is presently mandated by Annex III of the Rotterdam Convention. Instead, a somewhat similar, agreed approach was put in place that governed how chemicals would be included in the PIC procedure. The forerunner of the present-day UNEP Chemicals (known as “IRPTC – the International Register of Potentially Toxic Chemicals), was mandated to collect information (from Designated National Authorities) on chemicals banned or severely restricted by five or more countries. If a chemical was banned or severely restricted by ten or more countries, it was listed and the list was circulated, along with a forerunner of the present PIC Decision Guidance Documents, to all participating countries. Chrysotile asbestos was one of the substances that was included in the list and DGD circulated to participating countries (Personal Communication, Mr. Jan Huisman).

### **Under the Rotterdam Convention**

A long series of (thus far, unsuccessful) deliberations among Parties has taken place regarding the inclusion of chrysotile asbestos in Annex III since the Rotterdam Convention has been negotiated. The table below outlines the various attempts by some Parties to list chrysotile asbestos at key meetings related to the Convention.



<b>Efforts under the Rotterdam Convention Related to Chrysotile Asbestos</b>		
<b>Meeting/Date</b>	<b>Action</b>	<b>Outcome</b>
Voluntary PIC Procedure		
INC-10	Initial discussion of the addition of chrysotile asbestos to Annex 3	No conclusion
ICRCs	Recommendation to list chrysotile asbestos in Annex 3	Recommendation made to COP-1 for inclusion
COP-1 (September, 2004)	Parties unable to reach a consensus on its inclusion	Not listed
CRC-1 (February, 2005)	Recommendation to list chrysotile asbestos in Annex 3	Recommendation made to COP-2 for inclusion
COP-2 (September, 2005)	Parties unable to reach a consensus on its inclusion	Not listed
CRC-2 (February, 2006)	Recommendation to list chrysotile asbestos in Annex III of the Convention and forward to COP-3 the related draft Decision Guidance Document	Recommendation made to COP-3 for inclusion
COP-3 (October, 2006)	Parties unable to reach a consensus on its inclusion, cited need for a full report on alternatives (by WHO) to be made available	Not listed
CRC-3 (March, 2007)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-4 for inclusion
CRC-4 (March, 2008)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-4 for inclusion
COP-4 (October, 2008)	Referred the inclusion of chrysotile asbestos in Annex III to COP 5 and encouraged Parties to use the information exchange provisions of the convention (Article 14) in the meantime	Not listed
CRC-5 (March, 2009)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-5 for inclusion
CRC-6 (March, 2010)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-5 for inclusion
CRC-7 (March/April, 2011)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-7 for inclusion
COP-5 (June, 2011)	Parties unable to reach a consensus on its inclusion (India agreed to listing)	Not listed
CRC-8 (March, 2012)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-6 for inclusion
COP-6 (May, 2014)	Parties unable to reach a consensus on its inclusion (India against listing; Canada agreed to listing)	Not listed
CRC-9 (October, 2013)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-7 for inclusion
CRC-10 (October, 2014)	Chrysotile asbestos automatically forwarded to COP for consideration	Recommendation made to COP-7 for inclusion
COP-7 (May, 2015)	To be determined.	To be determined.

To summarize, the European Union, virtually all African states<sup>2</sup> (with the exception of a producer, Zimbabwe), Japan, Switzerland and other Parties have aggressively sought the listing of chrysotile asbestos since the initiations of deliberations under the Rotterdam Convention. Another group of Parties, including Russian Federation, Ukraine, Kazakhstan, and Kyrgyzstan (and occasionally India and Vietnam) have opposed listing of chrysotile asbestos, citing a lack of evidence of harm of the substance. Canada initially supported the latter group of Parties, but has since changes its position to support listing (see box, below).

Up to the present time, Vietnam has generally taken the position of opposing the inclusion of chrysotile asbestos under Annex III, but has not always been as consistently vocal in its opposition to listing as the aforementioned countries. At COP6, the Vietnamese delegation asserted that there is no link between chrysotile asbestos and asbestosis. Many other delegations opposing listing have also cited a lack of clear scientific evidence of harm.

The Chemical Review Committee has, since its first meeting, recommended the inclusion of chysotile asbestos on Annex III. Each successive Conference of the Parties of the Convention has deliberated over whether or not to include it, without consensus being reached (but without a formal vote being taken, as several Parties – China and Russia at COP-6, for example - have indicated that this would be contrary to the spirit and intention of the Convention). The EU, many Parties and international organizations such as ILO and WHO also support listing, citing a variety of scientific evidence.

One of the main arguments for the listing of chrysotile asbestos under Annex III of the Convention is that countries that still use chrysotile are not in any way consenting to a ban on its' use. However, arguments have been made (particularly at COP-4) some developing countries, perhaps because of the lack of local capacity to undertake their own risk evaluations, seemed to utilize an Annex III listing or even a CRC recommendation as a screening tool to ban or restrict the use of chemicals, thereby effectively creating a technical barrier to trade.

Over the years of repeated deliberations regarding chrysotile asbestos at the meetings of the Convention, several compromises have been attempted. None have resulted in a successful conclusion. COP-7, scheduled for May, 2015 in Geneva, Switzerland, will take up the matter once again.

---

<sup>2</sup> In fact, at COP-5, the African Group of states noted that, should chrysotile asbestos not be added to Annex III in the near future, they would have no choice but to contemplate establishing trade restrictions on the substance at the regional level.

## **Canada, Chrysotile Asbestos and the Rotterdam Convention**

Until recently, Canada consistently opposed the inclusion of chrysotile asbestos in Annex III of the Rotterdam Convention. This opposition, it has been argued, was not based on the lack of evidence of harm caused by chrysotile, but by a political issue unrelated to environment and health concerns.

Canada was a major exporter of chrysotile asbestos. This export originated from a largely “one-industry town” in the largely French-speaking province of Quebec. The town (appropriately named Asbestos, Quebec) recently ceased production of chrysotile asbestos.

Up until the cessation of asbestos mining in Quebec, governments saw possible support for listing of chrysotile on Annex III of the Rotterdam Convention as a direct threat to the jobs and livelihoods of the workers in Asbestos, Quebec. This is despite the fact that the Convention in no way bans the use of chemicals listed under Annex III from international trade.

The issue of asbestos mining in Canada was largely seen, some have argued, not as an issue of environment and health protection but as an issue related to the national unity of Canada – particularly the union of the country between its English-speaking and French-speaking peoples. Governments at all levels were reluctant to take actions that would in any way cause political tensions related to the national unity issue to surface. Governments were worried that, by supporting the listing of chrysotile in Annex III of the Convention, they would be accused of acting against the interests of Canada’s French-speaking minority, no matter what environment- and health-related benefits were to be gained from listing.

Other Parties to the Rotterdam Convention, particularly the EU, considered Canada’s opposition to listing chrysotile to be unacceptably outside the allowable scope of reasoning for deliberations under the Convention. Canada counter-argued that there were sound scientific reasons to oppose listing.

With the cessation of support for asbestos mining in Quebec from the (separatist) provincial government in 2011, Canada’s federal government was able to change its position to support the listing of chrysotile at the last Conference of the Parties (COP-6), in May, 2013.

Concurrently with the change of position of the Canadian government on this issue, funding for the Chrysotile Institute, an industry advocacy group 100% funded by the Canadian government, also came to an end.

The net result has been that one less country - Canada – now opposes the listing of chrysotile asbestos on Annex III of the Convention.

## 9. Alternatives and Costs

Since the use of asbestos has been phased out in many countries, there is ample information on alternatives. The list below outlines some of the alternative substances (the list was submitted by Parties to the Rotterdam Convention) in use in countries (primarily, but not limited to, construction materials). Each of the alternatives has its own advantages and drawbacks, and would need to be investigated by Vietnamese companies on a case-by-case basis.

### Roof Sheet Production

In the case of roof sheets, fiberglass and aluminum/iron alternatives are viable alternatives. Other, more “advanced” alternatives exist (according to Vinachemia, one asbestos-free Japanese-owned roof sheet plant is currently operating in Vietnam for export purposes only).

In terms of costs, roof sheet manufacturing using chrysotile asbestos, according to the industry, is currently the most cost-effective. In discussions with the roof sheet association, it was made very clear that the economic situation of the average Vietnamese is very weak compared many other countries where alternatives to chrysotile asbestos has been implemented. Asbestos-containing roof sheets are very low cost, and are therefore more easily available for purchase by poor persons in the construction of their homes and other buildings. Elimination of this source of affordable construction material, the industry association asserts, would put undue pressure on those in society who have the fewest economic and social advantages.

The other key factor, the industry notes, is that the quality and durability of alternatives is critical. This would also have to be taken into account in the search for alternatives.

The industry estimates that the cheapest alternatives that meet the quality/durability “test” would cost, on average, some twenty to fifty percent higher than asbestos-containing roof sheets. This is not acceptable to the industry. They also stated that further investigations/pilot projects on alternatives to asbestos-containing roof sheets would be welcomed by industry.

**List of Alternative Substances Submitted to the  
Rotterdam Convention Secretariat**  
UNEP/FAO/PIC/ICRC.5/INF.6 AND INF.6/ADD1 26 JANUARY 2004

<b>State</b>	<b>Alternative</b>
European Community	Cellulose fibres
	Polyvinyl alcohol (PVA) fibres
	P-aramid fibres
Chile	Cellulose fibres
Canada	Cellulose fibres
	Polyvinyl alcohol (PVA) fibres
	P-aramid fibres
	Polypropylene (CAS No. 9003-07-0)
Mauritius	Glass wool
	Man made mineral fibres
Japan	Man-made mineral fibres
	Glass fibre
	Glass wool
	Rock wool
	Slag wool
	Natural mineral fibre
	Sepiolite
	Wollastonite
	Aramid fibre
	Vynylon fibre
	Pulp
	Ceramic fibre
	Carbon fibre
	Basic magnesium sulfate whisker
	Potassium titanate whisker
	Silicon carbide whisker
Bulgaria	Polyvinyl alcohol (PVA)
	Polyacryl nitril (PAN)
	Aramid fibre
	Fibreglass
	Glass wool
	Rock wool
	Carbon fibre
Graphite fibre	
	Wollastonite
Australia	aramid (kevlar)
	para-aramid
	moulded aramid
	fibreglass
	polytetrafluoroethylene
	polyethylene
	polyvinylchloride
	vinyl compositions
	semi-metallics
	steel fibres
	ductile iron
	aluminium silicates
	carbon/graphite (fibres/composites)
	cellulose/vegetable fibres/cork composites
	refractory ceramic fibres/glass
	phosphate
	ashphalt
mica	
woolastonite	
mineral fibres/wool	
titanate fibres	

### **Asbestos in Vehicle Brakes:**

Chrysotile asbestos has been progressively replaced in most brake linings and pads by other fibers such as the synthetic aramids. In addition, finer grades of exfoliated vermiculite are being used in brake linings primarily for the automotive market. Both of these alternatives possess the needed characteristics to replace asbestos, including: thermal resistance and longevity.

Similarly to the situation with roof sheet production in Vietnam, cost estimates on alternatives for the Vietnamese situation do not appear to be available. Pilot studies on alternatives would assist in determining the best alternatives at the lowest cost. Unlike with the case of roof sheet production, data on imports and use of chrysotile asbestos for brake linings in Vietnam is not available. A more comprehensive inventory on asbestos in Vietnam would greatly assist in clarifying the current situation.

### **10. The legacy of asbestos-containing building materials and other asbestos-containing wastes: their Environmentally Sound Management (ESM) and associated economic costs for Vietnam**

The safe decommissioning of structures that contain asbestos poses a significant challenge, even for developed countries. Asbestos, when removed in a safe manner that protects workers and others, is an expensive exercise that requires significant training and use of safety equipment and enclosures. Issues to be considered in Vietnam include:

- An inventory/identification of asbestos-containing buildings should be considered, including training/capacity building for identifying asbestos-containing structures and undertaking detailed inventories;
- Workers who will undertake decommissioning need intensive training
- Proper safety equipment must be used to protect worker health;
- Areas where asbestos is being removed must be sealed off, thereby preventing contamination of outside air.

Costs for such undertakings in countries with such decommissioning programmes are significant. Donor support for pilot or demonstration projects would assist Vietnam in making their own cost estimates, consistent with the Vietnamese situation.

## 11. Overall cost-benefit summary

Sufficient information to make informed cost-benefit estimates for action on chrysotile asbestos in Vietnam was not available at the time of publication of this document. However, a number of trends/observations can be seen/made that can be shared for the consideration of the government of Vietnam. These include:

- In general, the sectors using chrysotile asbestos (roof sheet manufacturers and for the replacement of brakes) are not significant contributors to the tax base of the Vietnamese economy (Vinachemia, personal communication, November, 2014)
- The healthcare-related costs for treating persons exposed to asbestos need to be investigated in a detailed manner, and are likely to be significant (in the EU, costs in the 27 member states are estimated to exceed one billion euros per annum (EC, 2012));
- The economic benefits to Vietnamese consumers of using inexpensive chrysotile asbestos-containing roof sheets needs to be considered in detail;
- The costs of introducing less harmful alternative methods to manufacture roof sheets and replace vehicular brakes needs to be factored in;
- The opportunity cost of continuing production of asbestos-containing roof sheets vis-à-vis major trading partners (particularly the European Union) needs to be considered;
- The costs of enhancing worker protection, and awareness and protection of the public using asbestos-containing products (such as roof sheets and vehicular brakes) needs full consideration;
- The possibility of time-limited subsidies by government/donors could be considered as an option to address the (possibly) higher costs of asbestos-free alternatives.

Further study of these and other options can be considered once a comprehensive asbestos inventory (and consequent analysis) is undertaken (see recommendations).

## 12. Regulatory Impact Statement: a Tool for Decision-Making and Analysis

A regulatory impact statement, while differing in content and form from country to country, is basically a document that explains the steps that were followed in the development of a recommendation for the consideration of government, along with analysis of the benefits and costs should the government make a positive decision regarding the recommendation(s).

Regulatory impact statements are now used by many OECD countries, and are recommended for use by the World Bank. The following are some examples of RIS that the Vietnam Government may wish to consider as references as it further develops this tool.

Most, if not all regulatory impact statements take into account the following factors:

- A cost-benefit analysis of the proposed regulation/instrument;
- A description of the process that led to the finalization of the regulation (including public consultation, consultations within government, etc.);
- An explanation of how the proposed regulation/instrument will be implemented upon approval.

Key developed countries that have regularized the use of RIS include: Canada, the United Kingdom, the United States of America, the European Union and Australia.

Australia has a particularly advanced approach to RIS, citing three main types, each of which depends on the nature of the policies/laws that are proposed. The level of detail of the assessment, in general, becomes greater, the greater the potential impact of the measure on the economy. Detailed guidance for developing such assessments is publically available online at

<http://www.cuttingredtape.gov.au/handbook/australian-government-guide-regulation>

As the above website address implies, RIS were at least originally intended to streamline the process for regulatory approvals, while ensuring that proposed regulations/instruments were thoroughly analysed to ensure there is minimum unnecessary impact on business and other affected parties. In recent years, particularly among EU member states, RIS has also been linked to assessments of environmental and social impacts.

Vinachemia may wish to further develop its' own approach to analyzing and proposing new regulations/instruments using the RIS tool, particularly as new instruments are proposed as part of the "Road Map" towards the 2020 goal of discontinuing the use of chrysotile asbestos.



## **Regulatory Impact Assessment in New Zealand**

In New Zealand, all proposals to create, amend or repeal legislation or regulations that are submitted to Cabinet must be accompanied by a regulatory impact statement (RIS), unless an exemption applies. A RIS summarises:

- the problem that needs to be addressed
- the options for addressing the problem
- the costs and benefits of each option
- the people that have been consulted and their views
- the proposals for implementation and review

To help ensure that the regulatory process is open and transparent, RISs are published at the time the relevant bill is introduced to Parliament or the regulation is gazetted, or at the time of ministerial release.

<http://www.justice.govt.nz/policy/regulatoryimpactstatements>

### 13. Advantages/Disadvantages of Vietnam consenting to listing of Chrysotile

If the government of Vietnam, as a Party to the Rotterdam Convention, consents to the listing of chrysotile asbestos to Annex III of the Convention, it is suggested that there will be the following *advantages* for Vietnam:

#### Advantages:

- The listing of chrysotile asbestos on Annex III of the Convention *does not* translate into a banning of the use of CA: the Rotterdam Convention does not contain provisions banning any chemical substance; it merely obligates governments to take action to inform other governments when certain listed substances are being exported.
- Improved stature in the international community in terms of health and environment: Vietnam, if it allowed the listing of chrysotile asbestos to Annex III of the Rotterdam Convention, would contribute to the constructive efforts of most countries, who are attempting to ensure that the maximum information possible regarding the hazards of CA is in the hands of countries that import this substance, further contributing to informed decision-making
- Improved health of workers and poorest VN citizens: programmatic activities (with funding and technical assistance contributions from the international community) to strengthen safe use of CA, and to move towards discontinuing its' use in VN, would result in less exposure of at-risk populations to CA
- Possibility of technical and financial support from a wide variety of donors, which can be used to strengthen chemicals management and health/environment protection in general in VN: positive support for listing by VN can result in strengthened interest by the international community to support general efforts to improve chemical safety in VN, through support for a comprehensive national programme
- Opportunity to strengthen the information base regarding CA use in VN: support for listing on Annex III would obligate exporting countries to provide detailed information on its' hazards. This would contribute to the general information base on

CA in VN. In addition, international support could be sought for a comprehensive inventory and listing of CA use, disposal of CA-containing products, etc. in VN through a programme for capacity building in this area

- Economic development opportunity regarding testing and implementation of CA alternatives in VN: As VN is presently negotiating a Free Trade Agreement with the European Union, and the official policy of the Vietnamese government is to support development in a sustainable manner that benefits the people; production of non-CA-containing alternative products would assist in building an image of VN as a “clean” producer of chemicals and chemical inputs to products. This would create market opportunities for exports.
- Elimination of potential stumbling block to the successful negotiation of the VN-EU Free Trade Agreement. The EU has made it clear to countries with whom it does business that the protection of human health and the environment is a major criterion in its’ commercial decision-making. The commitment of VN to support listing of CA in Annex III, and a commitment to phase out, over time, the use of CA, would be very welcomed by the EU, and would remove a major point of concern regarding the ongoing FTA negotiations.
- Opportunity for consensus-based decision-making in VN benefitting both industry (through a sustainable transition) and health/environment (through transition towards eventual elimination of the use of CA and its’ replacement with less harmful alternatives). A diversity of opinions exists in Vietnam regarding the continued use of CA, particularly in the production of roof sheets (but also regarding its use in brake linings for vehicles). Several stakeholders see its’ continued use, due to its’ low costs, ease of use in the manufacturing process, etc. as distinct advantages for their main clients- persons of limited means. Health and environment related stakeholders see the potential exposure of workers and those with CA-containing products in their homes and businesses as preventable through the phase out of CA use and the safe removal of in-situ CA-containing building materials and other wastes over time. At present, there does not seem to be a consensus on this issue in Vietnam. The international attention on CA use in Vietnam afforded by the debate on its’ possible addition to Annex III at successive Conferences of the Parties of the Rotterdam Convention affords an opportunity, within Vietnam, for bringing these disparate stakeholders together in a transparent and open manner for a full debate on a possibly way forward. The Vietnamese government is in an excellent position to facilitate this debate and strengthen communication where barriers between stakeholders currently exist.

If the government of Vietnam, as a Party to the Rotterdam Convention, consents to the listing of chrysotile asbestos to Annex III of the Convention, it is suggested that there will be the following *disadvantages* for Vietnam:

### Disadvantages:

- Potential tensions with exporting countries (Russia, Zimbabwe, etc.)
  - At recent Conferences of the Parties of the Rotterdam Convention, a loose “coalition” of countries has been against the listing of CA in Annex III. Key among these include Russia, Zimbabwe, Colombia, and (previously) Canada. Vietnam has, up to the present, supported the position of these countries. Any change in Vietnam’s position on this issue has the potential for negative implications for relations with any or all of these countries. This would need to be assessed as part of the larger consideration of overall bilateral relations between Vietnam and each of these countries.
  
- Tensions may potentially with industry (Roof Sheet Association, individual users, etc): Roof Sheet Association members can attempt to create “political” difficulties if not “on board” with a change in the position of the VN government to support the listing of CA in Annex III
  
- Can turn into an issue of “social justice” if costs of alternatives prove to be too high
  
- Needs to be countered with issue of health protection of workers and end-users
  
- Potential impact on the poor (if alternatives are more costly): If alternatives to CA use in products prove to be more expensive (in discussions with several VN government officials, they have indicated that increased costs in the order of 40% are expected); this would have an impact on consumers. Pilot projects will help to address this issue.
  
- Potential job losses as a result of a transition to alternatives (if CA-using industrial facilities close).

## 14. Recommendations

### **Developing a “Road Map/National Action Plan” for the 2020 Phaseout of Chrysotile Asbestos in Vietnam: Major Components**

Vietnam’s goal of phasing out the use of chrysotile asbestos by 2020 is ambitious, particularly considering the number of companies using the substance in the production of roof sheets, the uncertain economics for the production of alternatives, and the lack of information currently available on the full extent of asbestos-containing products and presence of asbestos in structures in Vietnam. The recommendations for this Study Report are therefore grouped in a manner that, if addressed fully, can greatly assist the Vietnamese government as it implements the Road Map or National Action Plan. The recommendations are grouped as follows:

- 1) Development of a Situation Analysis/Comprehensive Inventory of chrysotile asbestos in Vietnam;
- 2) Full costing of alternatives through the implementation of three key pilots for production of alternatives to asbestos-containing roof sheets and one pilot on alternative to brake linings;
- 3) Training on strengthening implementation in Vietnam of key international conventions/agreements on chemicals/wastes and on chemicals in products (including law and policy development);
- 4) Strengthening worker safety, health surveillance, and public awareness to better understand the true costs of asbestos use in Vietnam, and to ensure affected individuals are identified and assisted;
- 5) Implementation of a demonstration project in Vietnam to illustrate the safe decommissioning of asbestos-containing buildings

The Vietnamese government, particularly Vinachemia, has indicated that, in order to reach the 2020 goal of phaseout of using chrysotile asbestos, and, in order to reinforce any possible commitment taken to support the listing of chrysotile asbestos under Annex III of the Rotterdam Convention, international assistance is required for the development of a detailed “Road Map” or “National Action Plan”. The following recommendations follow a step-wise approach that can assist Vietnam in clarifying what is needed (both at the domestic and international levels) for achieving the 2020 goal.

- Training of Vinachemia staff on inventory development for Annex III chemicals (*Training can be requested from the Secretariat of the Rotterdam Convention as part of a National Action Plan – see below*);
- Inventories should include the following comprehensive (where possible) information:
  - Imports of asbestos-containing products into Vietnam, and where they are used;
  - Exports of asbestos-containing roof sheets (including to neighbouring countries, if applicable);
  - Statistics on the import and use of chrysotile asbestos in brake linings in Vietnam;
  - Fate of asbestos-containing materials (particularly, but not limited to, roof sheets) at the end of their useful life;
  - Fate of asbestos byproducts of mining;
  - Fate of asbestos-containing wastes from the roof sheet production and brake lining replacement processes;
  - Production and use statistics of companies that are not members of the Vietnam National Roof Sheet Association
  - Presence of asbestos *in situ*, including in buildings in Vietnam

*(Training can be requested from the Secretariat of the Rotterdam Convention or from bilateral agreements with donor countries);*

- Training of Vinachemia staff (industrial chemicals) and staff of the Ministry of Agriculture (pesticides) (and those of other relevant ministries) by regional centers/secretariat in strengthening compliance with the Rotterdam Convention through the development of a National Action Plan, with a particular focus on the handling of information regarding Annex 3 chemicals (*Regional Centers with responsibilities for the Asia-Pacific Region (Tsinghua University, China, or Indonesia, for example) can be approached*);s
- Training of Vinachemia staff on chemicals in products, with an initial focus on asbestos-containing products (*the Swedish Chemicals Agency, KEMI, has particular expertise on this issue*);

- Training of Vinachemia staff and industry on implementation of the Globally Harmonized System for Classification and Labelling of Chemicals (GHS);
- Training of relevant Ministries in development, implementation and enforcement of chemicals-related legislation;
- Development and implementation of three pilot projects, including selection of appropriate industrial sites, illustrating different manufacturing alternatives to asbestos-containing roof sheets (*funded by a consortium of donors. Suggested supporters for the pilot projects can be: EU, Japan, Switzerland – all need to be approached in a coordinated manner*) and consideration of the provision of subsidies should no cost-effective alternative be found;
- Development and implementation of a pilot project on alternatives to chrysotile asbestos for use in brake pads in Vietnam;
- Undertaking of a study tour and/or site visits for key decision-makers in the Vietnamese Government to the Convention Secretariat in Geneva (to study implementation of the Rotterdam Convention) and to examples of countries that successfully implement the Convention on the national level (e.g. several EU countries/Switzerland/Japan) (*This study tour should take place before COP7 of the Convention*) (*Switzerland, for example, can be approached for short-notice funding for this small project*);
- Training of health professionals in health surveillance for asbestos-related diseases and related training of relevant officials in the economic impacts of asbestos-related diseases;
- Training of workers in the safe handling of asbestos-containing materials in all stages of their life cycle;
- Training of government inspectors to strengthen worker safety measures at facilities using chrysotile asbestos;

- Training of customs officials in monitoring and taking appropriate actions to protect health and the environment for imports of raw asbestos and exports of asbestos-containing products;
- Mobilization of donor resources to assist with awareness-raising for the public on asbestos issues, with a particular focus on groups of society at highest risk;
- Development/implementation of demonstration project addressing the safe decommissioning of asbestos-containing buildings, including industrial and residential buildings in Vietnam



## References

**Becklake, M.R., 1991.** The epidemiology of asbestosis. In: Monograph: Mineral Fibers and Health (Liddell FDK, Miller K, eds.) pp. 99-115. CRC Press, Boca Raton, FL, USA.

**European Commission (EC), 2012.** Practical Guidelines for the Information and Training of Workers Involved with Asbestos Removal or Maintenance Work. European Commission, Directorate-General for Employment, Social Affairs and Inclusion (Unit B.3).

**Jan W. Huismans, 2014.** (Former Director, UNEP-IPRTC), Personal Communication to the Author, November 2014.

**International Agency for Research on Cancer (IARC), 1987.** Summaries & Evaluations Asbestos (Actinolite, amosite, anthophyllite, chrysotile, crocidolite, tremolite) Supplement 7.

**International Programme on Chemical Safety (IPCS), 1986.** Environmental Health Criteria 53. Asbestos and other Natural Mineral Fibres. Published under the joint sponsorship of the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. World Health Organization, Geneva.

**International Programme on Chemical Safety (IPCS), 1998.** Environmental Health Criteria 203. Chrysotile Asbestos. Published under the joint sponsorship of the United Nations Environment Programme, the International Labour Organisation, and the World Health Organization. World Health Organization, Geneva.

**Lemen, R.A., 2004.** Asbestos in Brakes: Exposure and Risk of Disease. American Journal of Industrial Medicine 45: 229-237

**National Center for Biotechnology Information (NCBI), 2013.** Van Hai Pham, Thi Ngoc Lan Tran, Giang Vinh Le, Mehrnoosh Movahed, Ying Jiang, Nguyen Ha Pham, Hisashi Ogawa, and Ken Takahashi. Asbestos and Asbestos-related Diseases in Vietnam. Also see: <http://www.ncbi.nlm.nih.gov/pmc/articles/PMC3732140/>

**National Industrial Chemicals Notification and Assessment Scheme (NICNAS), 1999.** Asbestos (Chrysotile Asbestos) Safety Factsheet. Updated May 2013. Also see: <http://www.nicnas.gov.au/communications/publications/information-sheets/existing-chemical-info-sheets/chrysotile-asbestos-safety-factsheet>

**Royal Society of Canada, 1996.** A review of the INSERM Report on the health effects of exposure to asbestos: Report of the Expert Panel on Asbestos Risk.

**UNEP/FAO, 2004.** Information on substitutes for chrysotile asbestos. Information document for the Fifth Meeting of the Interim Chemical Review Committee of the Rotterdam Convention (UNEP/FAO/PIC/ICRC.5/INF.6 AND INF.6/ADD1 26 JANUARY 2004).

**US Environmental Protection Agency (US EPA), 1989.** Asbestos: Manufacture, Importation, Processing, and Distribution in Commerce Prohibitions; Final Rule (54 FR 29460, July 12, 1989).

**Vietnam National Roof Sheet Association, 2014.** Personal Communication to the Author, Hanoi, August, 2014.

**Vinachemia, 2014.** Personal Communication to the Author, Hanoi, August, 2014.

**Williams, R.L. and Muhlbaier, J.L., 1982.** Asbestos Brake Emissions. Environ Res 29:70–82.

**World Health Organization, 2014.** World Cancer Report 2014. ISBN 9283204298.