



## Emerging Contaminants

Volume 7, 2021, Pages 132-138

# China's synergy in the implementation of international conventions on chemicals and waste

Liyuan Liu <sup>a</sup>, Guanglong Wu <sup>b</sup>  , Yong Ren <sup>b</sup>, Yang Chen <sup>a</sup>, Qinzhong Feng <sup>a</sup>[Show more](#) 

Outline



Share



Cite

<https://doi.org/10.1016/j.emcon.2021.03.002>[Get rights and content](#)Under a Creative Commons [license](#)[Open access](#)

## Abstract

The international environmental conventions have become the main effective ways to solve the global environmental issues, which are also the most active convention mechanisms in the world. This paper studies development trend and the implementation of the international environmental conventions on chemicals and wastes in China, such as Basel Convention, Rotterdam Convention, Stockholm Convention and Minamata Convention. Based on the Multilateral Synergy of International Conventions on Chemicals and Wastes, gaps and needs of the management of chemicals and wastes in China, this article put forward proposals for China to implement the coordinated development of these four conventions in the future..

[Previous](#)[Next](#)

## Keywords

Chemicals and wastes; International conventions; Multilateral synergy

## 1. Introduction

In the context of global integration, global governance goes beyond the single issues of politics, economy, military and other aspects, requiring the participation and interaction of countries all over the world and the interaction and cooperation among major powers [1]. Currently, the formation of some mechanisms to solve global environmental issues through the conclusion and implementation of multilateral environmental agreements is becoming the main means and effective way to solve global environmental issues. These agreements are very important to deal with regional environmental issues [2].

The complexity and urgency of global environmental governance has intensified with the increasing scale of the participants, contents and objects of the global environmental governance system, multiple environmental conventions are interconnected and supporting each other [3,4]. The acceleration trend of coordination among international environmental conventions appears. Some international conventions are even more integrated and coordinated, gradually forming a complex and comprehensive international convention system covering various types of environmental pollution [5,6].

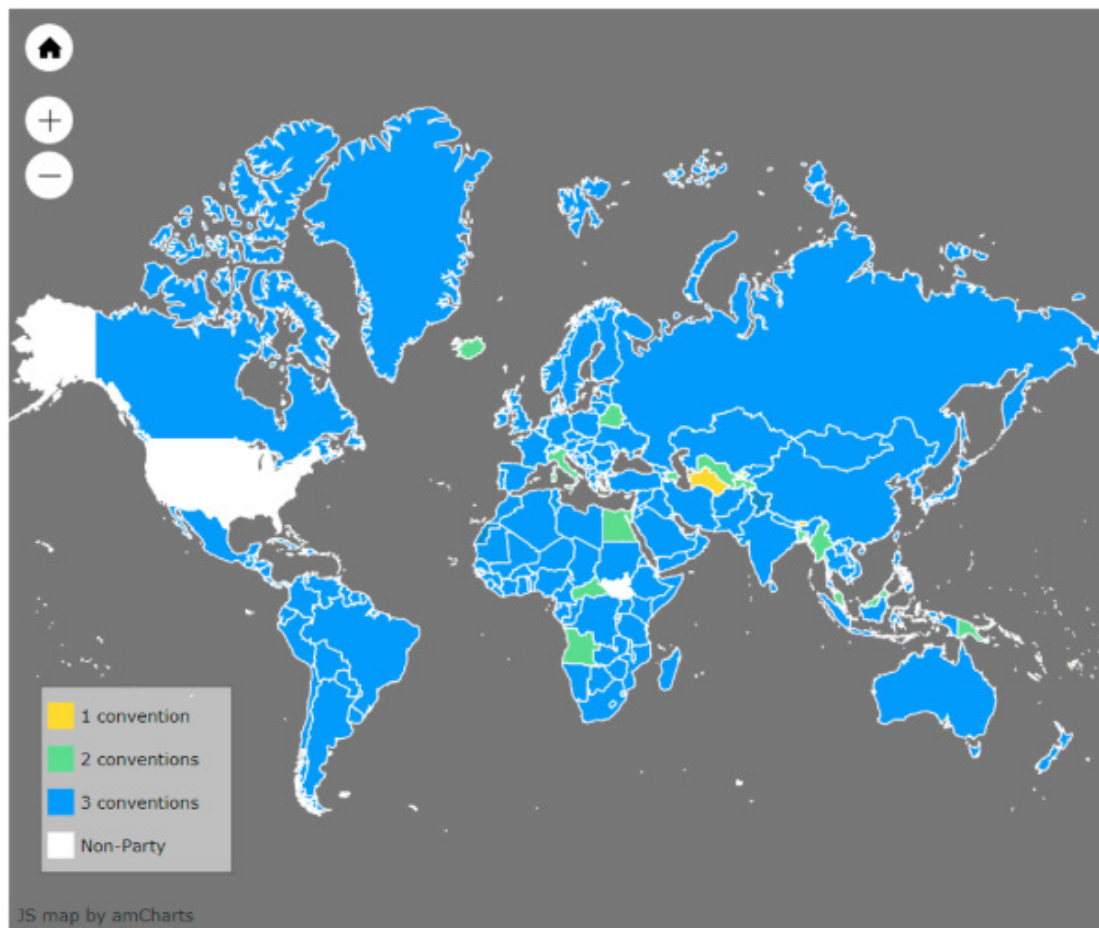
At present, China has signed or acceded to more than 50 international conventions and protocols related to environment [7]. Among them, *The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and Their Disposal* (Basel Convention), *Stockholm Convention on Persistent Organic Pollutants* (Stockholm Convention), *Rotterdam Convention on the Prior Informed Consent Procedure for Certain Hazardous Chemicals and Pesticides in International Trade* (Rotterdam Convention) and *Minamata Convention on Mercury* (Minamata Convention) have a certain degree of relevance, which basically covers the core elements of chemical and waste management, and all contribute to the Goal 12 (Ensure sustainable consumption and production patterns) of the "2030 Agenda for Sustainable Development" [8]. In the specific implementation process of the above four conventions, China has carried out some collaborative implementation work and achieved good synergy. This article will introduce China's efforts in the synergy of the four conventions, analyze the advantages and disadvantages of the synergy of the conventions, and put forward proposals for China to implement the coordinated development of these four conventions in the future.

## 2. Overview of international conventions on chemicals and wastes

The main regional distribution of *Basel Convention*, *Rotterdam Convention* and *Stockholm Convention* parties is shown in the figure.

("1 convention" indicates that the country or region has ratified one convention, "2 conventions" indicates that the country or region has ratified two conventions, "3 conventions" indicates that the country or region has ratified three conventions)

The parties to the *Basel Convention*, *Stockholm Convention* and *Rotterdam convention* include most countries in the world (as shown in Fig. 1). Although the *Minamata Convention* has just entered into force, the number of parties has reached 127 in more than three years, showing that its influence and scope are also very wide. The basic situation of these four conventions is shown in Table 1.



[Download : Download high-res image \(725KB\)](#)

[Download : Download full-size image](#)

Fig. 1. Status of Ratifications on the Basel, Rotterdam and Stockholm convention [9].

Table 1. Basic situation of *Basel Convention*, *Stockholm Convention*, *Rotterdam convention* and *Minamata Convention*.

Name	<i>Basel convention</i>	<i>Stockholm convention</i>	<i>Rotterdam convention</i>	<i>Minamata convention</i>
Approved Time	1989	2001	1998	2013
Effective time	1992 [10]	2004	2004	2017

Name	<i>Basel convention</i>	<i>Stockholm convention</i>	<i>Rotterdam convention</i>	<i>Minamata convention</i>
Target	Protect human health and the environment against the adverse effects of hazardous wastes [11].	Reduce or eliminate the emission of persistent organic pollutants (POPs) and protect human health and the environment from their hazards [15].	Require the parties to implement a set of decision-making procedures for the import and export of some extremely dangerous chemicals and pesticides, namely Prior Informed Consent (PIC) procedure [17].	Control and reduce global mercury emissions [20].
Scope	Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" - household waste and incinerator ash [12]. (45 hazardous wastes listed in Annex I) [13]	There are 30 kinds of controlled substances in the Convention, and the focus of the Convention control is shifting from the original pesticides to a wider range of industrial chemicals.	50 kinds of chemicals have been included in the Annex III, including 34 kinds of pesticide chemicals (including 3 severely hazardous pesticide preparations), 15 industrial chemicals and 1 pesticide and industrial chemical [18].	The Convention covers the entire "life cycle" of anthropogenic mercury pollution, including banning the establishment of new mercury mines, phasing out the existing mercury mines, regulating handicraft industry and small-scale gold mining, and reducing mercury emissions and use [21]. It also stipulates the mechanisms for temporary storage and disposal of mercury wastes [22].
Signatories	53	152	72	119
Parties	188 [14]	184 [16]	161 [19]	127 [23]

As shown in [Table 1](#), the management content of the four conventions has many cross-cutting areas, such as the control of pesticides and chemicals, and the environmentally sound management of wastes containing POPs and mercury. At the same time, the implementation of chemicals, waste cross-border transfer and [multilateral trade](#) will not only require all countries to take action, but also require stakeholders, including enterprises, civil society, the private sectors and academia, to participate in environmental management [24]. Therefore, the four international conventions require greater multilateral synergy in the global governance of chemicals and wastes.

### 3. The synergy implementation of the international convention on chemicals and wastes in China

#### 3.1. China's policy measures and effects on chemicals and pesticides

There are 30 kinds of controlled substances in the POPs Convention, and about 23 of these were approved by China (Table 2).

Table 2. List of the POPs convention controlled substances.

Conference of the Parties	Time	Approved POPs substances	China's Ratification
The First Conference of the Parties	2001	Annex A: Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Mirex, Toxaphen, Hexachlorobenzene and Polychlorinated biphenyls Annex B: DDT Annex C: Polychlorinated p-benzodioxins and Polychlorinated p-benzofuran, Hexachlorobenzene and Polychlorinated biphenyls	Approved in 2004
The Fourth Conference of the Parties	2009	Annex A: $\alpha$ -hexachlorocyclohexane, $\beta$ -hexachlorocyclohexane, Lindane, Hexabromodiphenyl Ether and Heptabromodiphenyl ether, Tetrabromodiphenyl ether and Pentabromodiphenyl ether, Hexabromobiphenyl, Chlordecone and Pentachlorobenzene Annex B: Perfluorooctane Sulfonic Acid and its salts	In 2014, 12 ministries and commissions including the Ministry of Environmental Protection and the Ministry of Foreign Affairs jointly issued the announcement on the <i>Amendments to Annex A, Annex B and Annex C of the Stockholm Convention on Persistent Organic Pollutants</i> , which added 9 persistent organic pollutants [25].
The Fifth Conference of the Parties	2011	Annex A: Endosulfan	In 2014, 12 ministries and commissions including the Ministry of Environmental Protection and the Ministry of Foreign Affairs jointly issued the announcement on the entry into force of <i>the Amendment to Annex A, which added Endosulfen</i> .

Conference of the Parties	Time	Approved POPs substances	China's Ratification
The Sixth Conference of the Parties	2013	Annex A: Hexabromocyclododecane	In 2016, 11 ministries and commissions including the Ministry of Environmental Protection and the Ministry of Foreign Affairs jointly issued the announcement on the entry into force of the <i>Amendment to Add Hexabromocyclododecane to the Stockholm Convention on Persistent Organic Pollutants</i> [26].
The Seventh Conference of the Parties	2015	Annex A: Hexachlorobutadiene, Pentachlorophenol and its salts Annex A and Annex C: PCN	As of December 2020, these POPs has not been approved in China.
The Eighth Conference of the Parties	2017	Annex A: Decabromodiphenyl ether, Short Chain Chlorinated Paraffin Annex C: Hexachlorobutadiene	As of December 2020, these POPs has not been approved in China.
The Ninth Conference of the Parties	2019	Annex A: Dicofol, Perfluorooctanoic Acid and Its Salts	As of December 2020, these POPs has not been approved in China.

The Chinese government has made important contributions to the elimination of global POPs. The performance results of the Chinese government are shown in [Table 3](#).

Table 3. China's policy measures and results on POPs substances.

No.	POPs substances	China's policy measures and results on POPs substances
1	DDT, chlordane, mirex and hexachlorobenzene	<ul style="list-style-type: none"> <li>● Since May 17, 2009, it is prohibited to produce, circulate, use, import and export DDT, chlordane, mirex and hexachlorobenzene within the territory of the People's Republic of China [27].</li> <li>● As of June 2014, the first batch of 9 pesticide POPs substances (Aldrin, Dieldrin, Endrin, Heptachlor, Toxaphene, Chlordane, Hexachlorobenzene, and Termite And DDT).</li> </ul>

No. POPs substances	China's policy measures and results on POPs substances
2 Lindane and endosulfan	<ul style="list-style-type: none"> <li>● Since March 26, 2014, lindane, perfluorooctane sulfonic acid and its salts, perfluorooctyl sulfonyl fluoride, and endosulfan are prohibited from production, except for specific exemptions and acceptable uses (see attached table). Circulation, use, import and export [25].</li> <li>● Since March 26, 2019, the production, circulation, use, import and export of lindane and endosulfan (except for specific exemptions) are prohibited [28].</li> <li>● By the end of 2019, the production and use of lindane and endosulfan will be eliminated.</li> </ul>
3 $\alpha$ -hexachlorocyclohexane, $\beta$ -hexachlorocyclohexane, chlordecone, pentachlorobenzene, hexabromobiphenyl, tetrabromodiphenyl ether and pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether Phenyl ether	<ul style="list-style-type: none"> <li>● Since March 26, 2014, the production, circulation, use, import and export of <math>\alpha</math>-hexachlorocyclohexane, <math>\beta</math>-hexachlorocyclohexane, chlordecone, pentachlorobenzene, hexabromobiphenyl, and tetrabromo Diphenyl ether and pentabromodiphenyl ether, hexabromodiphenyl ether and heptabromodiphenyl ether [25].</li> <li>● By the end of 2014, complete the phase-out of chlordecone, pentachlorobenzene, hexabromobiphenyl, <math>\alpha</math>-hexachlorocyclohexane, <math>\beta</math>-hexachlorocyclohexane, commercial pentabromodiphenyl ether and commercial octabromodiphenyl ether.</li> </ul>
4 Perfluorooctane sulfonic acid and its salts, perfluorooctyl sulfonyl fluoride	<ul style="list-style-type: none"> <li>● Since March 26, 2019, the production, distribution, use, import and export of PFOS and its salts and PFOS other than acceptable uses (except for 6 specific exempted uses and In addition to the 7 acceptable uses) [28].</li> <li>● Since 2016, PFOS has been included in the national POPs statistical survey system.</li> </ul>
5 Hexabromocyclododecane	<ul style="list-style-type: none"> <li>● Since December 26, 2016, the production, use and import and export of hexabromocyclododecane are prohibited (except for specific exemptions) [26].</li> <li>● Since 2016, HBCD has been included in the national POPs statistical survey system.</li> </ul>

The elimination and restriction of the aforementioned pesticides and chemicals not only promoted the implementation of the *Stockholm Convention*, but also promoted the implementation of the *Rotterdam Convention*. At present, there are 49 chemicals in the Annex III list of the *Rotterdam Convention*, of which 35 are pesticides, accounting for about 70% of the entire list [29]. With the implementation of the *Stockholm Convention*, most of the pesticides listed in Annex III have been banned in my country. Currently, alachlor, aldicarb, carbofuran, trichlorfon, and phorate are produced, used, and imported and exported in my

country. 5 kinds. my country's banned or strictly restricted pesticides are still exported, including paraquat, metsulfuron-methyl, 2,4-D butyl ester, methyl bromide, and pyrethionine [30].

### 3.2. China's policy measures and effects on POPs waste

In the process of implementing the agreement, the Chinese government completed the coordinated implementation of the *Basel Convention* and the *Stockholm Convention* through the environmentally sound disposal of POPs waste. The specific conditions are shown in the [Table 4](#).

Table 4. China's policy measures and effects on POPs waste.

No.	POPs waste	China's policy measures and effects on POPs waste
1	<b>Soils contaminated by DDT/HCH</b> [31]	The project soundly disposed of 6,352 t <b>pesticide POPs (DDT/HCH)</b> and 42,000 t <b>soils contaminated by DDT/HCH</b> . All legacy stockpiles of POPs pesticides known at the time of the project implementation were destroyed within the project duration. The amount of POPs wastes disposed is far beyond the project design requirements. The evaluation estimated that the sound disposal of the POPs pesticides and pesticides wastes reduced the health risks to a population ranging from 4.3 million to over 15 million people.
2	PCBs waste [32]	As of the end of 2015, a total of more than 5,200 online and ground temporarily stored <b>electrical equipment containing PCBs</b> in 20 provinces including Hebei and Shanxi were disposed of, with a disposal rate of 100%. As of July 2020, my country has dealt with more than 30 provinces including Heilongjiang, Jilin, Gansu, Henan, Hebei, Shanxi, Shandong, Jiangsu, Anhui, Sichuan, and Guangdong that have not been disposed of or newly discovered during the "Twelfth Five-Year Plan" period. The electrical equipment containing PCBs in the underground storage sites was harmlessly disposed of, and the targets of 2025 and 2028 of the Convention were completed ahead of schedule.
3	PBDE waste [33]	During the implementation period of the project, about 284,890 tons of <b>PBDE-containing plastics</b> were safely recycled and treated by the project, three demonstration enterprises under the project have co-processed a total of 13,500 tons of waste CRT glass.

Since the entry into force of the Convention, the Chinese government has actively promoted the implementation of a number of compliance projects. Judging from the implementation effect of the GEF project, China has successively processed soils containing DDT/HCH, PCBs waste and PBDE waste.

### 3.3. China's policy measures and effects on mercury

The *Minamata Convention* has many links with the other three conventions in terms of atmospheric mercury pollution control, mercury and its compounds control, and mercury-containing waste control. The details are shown in the [Table 5](#).

Table 5. China's policy measures and effects on mercury.



No. Mercury pollution control	China's policy measures and effects on mercury
1 Industry end pollution control technology and equipment upgrade [34]	In the process of implementing the <i>Stockholm Convention</i> , China carried out dioxin BAT/BEP technology emission reduction demonstrations in domestic waste incineration, medical waste disposal, papermaking, secondary copper smelting and other industries. The promotion of the use of air pollution control equipment such as activated carbon jets and bag filters, while achieving dioxin emission reductions, has also played a role in synergistic mercury removal.
2 Control of mercury and its compounds	In 2020, China issued the "List of Strictly Restricted Toxic Chemicals in China", which includes the import and export control of mercury and its compounds. This is not only the requirement for mercury and its compounds in the <i>Minamata Convention</i> , but also the Rotterdam Convention: [35].
3 Mercury-containing waste management and control	The requirements for the management of mercury-containing wastes in the <i>Minamata Convention</i> include: refer to the guidelines of the <i>Basel Convention</i> and manage them in an environmentally sound manner; on November 5, 2020, the Ministry of Ecology and Environment reviewed and approved in principle the revision of the new version of "National Hazardous Waste List" [36]. The category code of mercury-containing waste is HW29 and is classified in detail according to the source and industry of mercury-containing waste.

Since the *Minamata Convention* is a newly signed convention, the coordination mechanism, industry policies, stakeholder communication platforms, and management experience established by the Chinese government in the process of implementing the *Stockholm Convention* and other conventions involving chemical and waste management can be used to achieve convention synergy implementation.

## 4. The synergy implementation need of the international convention on chemicals and wastes in China

### 4.1. Demand for multilateral synergy in global governance

The International Conventions require the global governance of chemicals and wastes to be more systematic. The gradual in-depth coordination of *Basel Convention*, *Stockholm Convention*, *Rotterdam Convention*, *Minamata Convention* and other international conventions requires not only the establishment of transparent, standardized and quantifiable environmental management policies among countries, governments and organizations, so as to strengthen the global environmental governance policies with multilateral participation and multi-agent supervision. Among them, the common target of *Basel Convention*, *Rotterdam Convention* and *Stockholm Convention* is to protect human health and environment from hazardous chemicals and waste, which are also conventions with significant impact. The international community has been committed to strengthening cooperation and coordination among *Basel Convention*,

*Rotterdam Convention* and *Stockholm Convention* in the past few years. These efforts, known as "SYNERGIES", with the adoption of proposals to strengthen cooperation and coordination among the three conventions at the 2008–2009 Conference of the Parties, the corresponding special sessions of the Conference of the Parties for the *Basel Convention*, *Rotterdam Convention* and *Stockholm Convention* were held for the first time in Bali, Indonesia in February 2010. The international community recognizes that under the three conventions, collaborative work at the national, regional and global levels needs to be strengthened. Coordination and efficiency is the development trend of international environmental conventions, that is, to strengthen the implementation of the three conventions at the national, regional and global levels, enhance the efficiency of support to parties to these conventions, reduce their administrative burden and maximize the effectiveness and efficiency of resource utilization at all levels by providing consistent policy guidance while maintaining the legal autonomy of the three multilateral environmental agreements. In order to promote the implementation of the Conventions, the Conference of the Parties has adopted a series of decisions aiming at strengthening the cooperation and coordination among the conventions over the years.

The International Conventions require global governance of chemicals and wastes to enhance the transparency of data and indicators. The realization of environmental targets in the environmental governance system depends more and more on the governance driven by data and indicators. In the next 15 years, the sharing and transfer of science and technology will undoubtedly accelerate. The disclosure of environmental data of chemicals and wastes throughout the process is very important for the realization of environmental indicators in sustainable development. These data are important tools to support global and national decision-making. Standard and accurate data will lead to a revolution in environmental data in the management of chemicals and waste, and will bring more environmental political pressure.

#### 4.2. Demand for strengthening the ability to implement the convention

The Multilateral Environmental Agreements (MEAs) such as the *Basel Convention*, the *Stockholm Convention*, the *Rotterdam Convention* and the *Minamata Convention* are international treaties, conventions, agreements and protocols signed by many countries on environmental issues. Presently, nearly 300 Multilateral Environmental Agreements have been reached internationally, of which nearly 30 are directly related to trade and environment. As the international conventions and agreements, the Multilateral Environmental Agreements are also one important international law basis of environmental policy, with great restrictions on the trade modes and trade transactions that destroy the environment.

Only by establishing a Full Life Cycle Environmental Management System for Chemicals and Wastes can actively participate in the environmental legislation of global governance. As a responsible major country in the world, China shall actively participate in the environmental legislation activities of global governance and take the initiative to put forward its own legislative proposals on environmental policies. Full life cycle environmental management of chemicals and wastes is playing an increasingly important role in the framework of multilateral environmental agreements such as the *Basel Convention*, the *Stockholm Convention*, the *Rotterdam Convention* and the *Minamata Convention*. The use of environmental exception right in developed countries is obviously higher than in developing countries. In addition, in recent years, the trade disputes caused by environment between member countries of developed countries and developing countries are increasing day by day, and green barriers set by developed countries to developing countries are also increasing. If there is no institutional mechanism to link up international conventions

and environmental management of chemicals and wastes in developed countries, developing countries will often lose the initiative in the adjudication made by the dispute settlement body. Therefore, only by striving for establishing an institutional system of environmental management for chemicals and wastes in the full life cycle at the legislative level, can the rights of developing countries be fully considered, the interests of developing countries be protected, and the economic and legal rights and interests in China's foreign trade be realized.

Only by establishing the Full Life Cycle Environmental Management System for Chemicals and Wastes, can the environmental interests of developing countries be upheld. In the game between the environment and the multilateral trade system, China has realized the huge losses caused by the environmental trade measures of developed countries to developing countries. Developing countries, including China, are far from developed countries in terms of environmental technology and environmental protection level. Blindly raising the environmental threshold by developed countries has seriously restricted the economic development of developing countries. Therefore, China should establish a sound mechanism and system for environmental management of chemicals and wastes, so as to adhere to the interests of developing countries and always represent the interests of developing countries in the negotiation of environment and multilateral trade system, so as to realize the sincere cooperation and fair competition of the multilateral trading system.

Only by building the Full Life Cycle Environmental Management System for Chemicals and Wastes can China closely contact with other countries and carry out international environmental cooperation. The establishment of a Full Life Cycle Environmental Management System for Chemicals and Wastes will play an important role in promoting China's environmental policy. First, within the framework of the Convention, China shall pay close attention to the environmental trends of developed countries, strive to cooperate with them, and learn from more advanced environmental protection technologies and measures. Second, in the multilateral trade system for chemicals and wastes dominated by developed countries, China shall work more closely with other developing countries to conduct common consultations and discussions on common environmental issues, so as to form a unified negotiation target and strategy. In the negotiation of environment and multilateral trade system, developing countries are in a weak position. However, if developing countries can form relevant legal alliances and show their own legislative proposals, it is believed that it will be more effective than a single "one-to-one" confrontation.

Only by establishing a Full Life Cycle Environmental Management System for Chemicals and Wastes, under the current multilateral trade regime, can the relevant issues be referred to a dispute-resolution body under the Convention. The latest position and attitude towards environment and multilateral trade can be obtained through the adjudication of trade disputes of the Convention.

#### 4.3. Reduce environmental management cost requirements

With the rapid development of China's market economy, the environmental issues are becoming more and more serious. Environmental pollution incidents occur frequently, so it is urgent to protect the environment. Enterprises are the main destroyers of the environment. With the rapid development of production, enterprises accelerate the speed of environmental damage. However, enterprises do not bear the corresponding responsibility for environmental pollution. As a result, the external diseconomy of environmental costs is caused and the interests of the broad masses of people and society are damaged. To give full play to the advantages of life cycle cost management of chemicals and wastes and make reasonable

and effective management decisions can effectively reduce environmental costs, promote the coordination of economic and social benefits, comply with the requirements of sustainable development, and comprehensively enhance the competitive advantage of enterprises.

The establishment of environmental cost system based on the life cycle of chemicals and wastes has been proved to be an effective management mode by numerous practices. The advantage of the full life cycle environmental management of chemicals and wastes is that, firstly, it pays attention to the control and management of the environmental costs of chemicals and wastes in the full life cycle, so as to ensure the integrity of product costs; secondly, ecological design and cleaner production can control the pollution from the source, which is a preventive environmental strategy, avoiding the environmental damage and waste of resources caused by terminal treatment; finally, the target of life cycle environmental cost management of chemicals and wastes is to achieve the coordinated development of economic and social benefits, so as to minimize environmental pollution and maximize economic and social benefits.

The establishment of Full Life Cycle Environmental Management System for Chemicals and Wastes is an effective way to internalize the environmental cost of enterprises. The development of enterprises is at the cost of the destruction of the environment, and is an overdraft of environmental resources, which affects the interests of current and future generations, and is a very wrong way of economic development. With the improvement of China's environmental protection policies and regulations, and the gradual improvement of people's awareness of environmental protection, enterprises must assume their environmental responsibilities in order to survive and develop, and give a reasonable account to the public. Through the internalization of the cost of the full life cycle of chemical and waste research, development, production, transportation, storage, marketing, use, treatment and disposal, the enterprises' awareness of environmental protection can be strengthened and the enterprises' impact on environmental damage and pollution can be positively reduced.

The establishment of a Full Life Cycle Environmental Management System for Chemicals and Wastes is an effective means for enterprises to strengthen their international competitive advantage. After China's accession to many international conventions, the competition situation of enterprises is becoming more and more severe. Enterprises are facing pressure from international trade competition, technical barriers to trade, international environmental regulations and so on. If an enterprise wants to stay in business, it must control and manage the environmental cost effectively, internalize the external diseconomy of environmental cost, actively participate in international exchange and cooperation, learn and draw lessons from foreign research results, actively explore in practice, establish a good corporate image of environmental protection and improve the competitive advantage of products. In the fierce market competition both at home and abroad, the survival and development of Chinese enterprises must incorporate environmental factors into their strategies and daily decisions. Therefore, in this situation, a full accounting of the environmental costs of chemicals and wastes throughout their full life cycles is essential.

## 5. China's proposal to synergy on international convention on chemicals and wastes

Although the *Basel Convention*, *Rotterdam Convention*, *Stockholm Convention*, and *Minamata Convention* all belong to the same environmental topic, the specific objectives, control objects, and systems of the conventions are different, thus exhibiting strong and complex intersectionality and comprehensiveness.

Each convention has its own legal independence and governing system. How to achieve synergy? Can synergy really promote the implementation of the various conventions and their effectiveness, and improve the effectiveness of the cost of capital? These issues need to be explored and studied in practice.

China shall consider building and improving the environmental management system of chemicals and wastes, increasing the internal environmental management of the environmental management system of chemicals and wastes in the full life cycle, strengthening the environmental risk management and control, and preventing the occurrence of environmental pollution incidents; and China shall build a sound multilateral coordination mechanism for chemicals and wastes, actively play an important role in public diplomacy in international environmental affairs typically represented by environmental conventions, and enhance international influence and status through the implementation of environmental conventions. At the same time, China shall actively coordinate and guide the negotiation of international environmental conventions by building a sound full life cycle environmental management policy. Behind every promotion and development of environmental conventions, there are extremely difficult national negotiations and games. To build a sound environmental management policy in the full life cycle is conducive to striving for favorable negotiation advantages. In view of the above problems, on the one hand, it is suggested to establish a sound legal binding mechanism through international conventions and international environmental laws with the nature of hard law; on the other hand, it is suggested to increase domestic investment in the implementation of the conventions, refine the environmental management system and the implementation rules of the conventions, clarify the responsibility mechanism, and improve China's ability to implement the conventions.

## Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

## Acknowledgements


This work was supported by the National Key Research and Development Project of China (2019YFC1805600) and the Global Environment Facility (Project 5383) and the contributions are appreciated.

[Recommended articles](#)

## References

- [1] Qiguo Zhao, Yongming Luo, Ying Teng, *et al.*  
**Current situation and research progress of environmental protection at home and abroad**  
Acta Pedol. Sin. (June 2009), pp. 1146-1154  
[View Record in Scopus](#) [Google Scholar](#)
- [2] Xinhuan Huang  
**Construction and strategic choice of global environmental governance system**  
Review of Economic Research, 16 (2016), pp. 4-11

[CrossRef](#) [Google Scholar](#)

- [3] Liang Dong  
**How to gradually strengthen the united nations environment programme**  
J. China Univ. Geosci. (January 2017), pp. 100-109  
[CrossRef](#) [View Record in Scopus](#) [Google Scholar](#)
- [4] Liang Dong  
**The concept of global environmental governance in xi jinping thought on ecological civilization**  
Teaching And Research (December 2018), pp. 30-38  
[CrossRef](#) [Google Scholar](#)
- [5] Hongyan Liu  
**International legal regulations of nuclear energy utilization and ecological security guarantee [J]**  
Academic Exchanges (December 2015), pp. 84-90  
[Google Scholar](#)
- [6] Ye Qi. Global environmental governance system: evolution, dilemma and future trend. Ecological Economy. (September 2016).Vol.32, 157-161, 176.  
[Google Scholar](#)
- [7] Hongtao Li, Du Xuan, Tianjin Cheng, Shuxian Li  
**Study on China's Implementation Effect of International Environmental Conventions and the Implementation Focus of the "Thirteenth Five-Year Plan**  
Environmental Protection, 44 (10) (2016), pp. 46-50  
[Google Scholar](#)
- [8] United Nations  
**Transforming our world: the 2030 Agenda for sustainable development**  
<https://sdgs.un.org/2030agenda>  
[Google Scholar](#)
- [9] Secretariat of the Basel, Rotterdam and Stockholm Conventions  
**Status of Ratifications the Basel, Rotterdam and Stockholm conventions**  
<http://www.brsmeas.org/Decisionmaking/PartiestotheConventions/Statusofratification/tabid/5936/language/en-US/Default.aspx>  
[Google Scholar](#)
- [10] Iwona Rummel-Bulska  
**Chapter II.2 - the Basel convention and its implementation**  
Waste Manag., 4 (2004), pp. 133-169  
[Article](#)  [Download PDF](#) [View Record in Scopus](#) [Google Scholar](#)
- [11] **Review on legal system of international chemicals and hazardous wastes.Environmental Protection**  
43 (17) (2015), pp. 61-63  
[Google Scholar](#)

- [12] Secretariat of the Basel Convention  
**Basel convention on the control of transboundary Movements of hazardous wastes and their disposal**  
<http://www.basel.int/TheConvention/Overview/tabid/1271/Default.aspx>  
[Google Scholar](#)
- [13] Li Jin-hui, Wang Jie-cong, Zheng Li-xia  
**Development of the international waste management in the prospective of Chess, Taking Basel convention as example**  
China Population, Resources And Environment, 26 (5) (2016), pp. 94-97  
[Google Scholar](#)
- [14] **Secretariat of the Basel convention**  
<http://www.basel.int/Countries/StatusofRatifications/PartiesSignatories/tabid/4499/Default.aspx#enote1>  
[Google Scholar](#)
- [15] Fengzu Zhang  
**Three international conventions concerning the prohibition and restriction of pesticides**  
Pesticide Science And Administration (October 2017), pp. 54-59  
[Google Scholar](#)
- [16] **Secretariat of the Stockholm convention**  
<http://chm.pops.int/Countries/StatusofRatifications/PartiesandSignatoires/tabid/4500/Default.aspx>  
[Google Scholar](#)
- [17] Hongtao Li, Yuanyuan Wen, Xuan Du, Xiaohua Yang  
**Developments and Trends of Major Global Multilateral Environmental Agreements in 2016 and Their Implications for China's Convention Implementation**  
Environmental Protection (August 2017), pp. 74-78  
[Article](#)  [Download PDF](#) [Google Scholar](#)
- [18] Secretariat for the Rotterdam Convention  
<http://www.pic.int/Procedures/ImportResponses/Database/tabid/1370/language/en-US/Default.aspx>
- [19] Secretariat for the Rotterdam Convention  
<http://www.pic.int/Countries/Statusofratifications/tabid/1072/language/en-US/Default.aspx>
- [20] Li Zheng, Chunlan Liu, Caocao Chen  
**Analysis on Control Process of World Mercury Convention [M]**  
Annual Meeting of Chinese Society for Environmental Sciences (August 2011), pp. 60-64  
[View Record in Scopus](#) [Google Scholar](#)
- [21] Wubin Li, Bin Zhang  
**Preparation of AuCl<sub>3</sub>-BiCl<sub>3</sub>/C and performance of catalyst**  
Pet. Process. Petrochem. (March 2018), pp. 21-24  
[Google Scholar](#)

- [22] Zhongfa Ma  
**Minamata Convention on mercury and the improvement of China's legal system for mercury pollution control**  
Fudan J. (Soc. Sci. Ed.) (February 2015), pp. 157-164  
[View Record in Scopus](#) [Google Scholar](#)
- [23] **Secretariat for the Minamata convention on mercury**  
<http://www.mercuryconvention.org/Countries/Parties/tabid/3428/language/en-US/Default.aspx>  
[Google Scholar](#)
- [24] Zhiyu Huang  
**Optimization of China's multi governance system of natural resources in the context of ecological civilization**  
Jiangxi Social Sciences (October 2017), pp. 218-226  
[View Record in Scopus](#) [Google Scholar](#)
- [25] Ministry of Environmental Protection, Ministry of Foreign Affairs, Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Housing and Urban-Rural Development, Ministry of Agriculture, Ministry of Commerce, Health and Family Planning Commission, General Administration of Customs, General Administration of Quality Supervision, Inspection and Quarantine, General Administration of Safety Supervision  
Regarding the "Annex A, Annex B and Annex C Amendments" regarding the "Stockholm Convention on Persistent Organic Pollutants" for the newly listed nine persistent organic pollutants  
Announcement on the entry into force of the Amendment to Annex A(2014,No.21) (2014)  
[http://www.mee.gov.cn/gkml/hbb/bgg/201404/t20140401\\_270007.htm](http://www.mee.gov.cn/gkml/hbb/bgg/201404/t20140401_270007.htm)  
[Google Scholar](#)
- [26] Ministry of Environmental Protection, Ministry of Foreign Affairs, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Finance, Ministry of Housing and Urban-Rural Development, Ministry of Commerce, General Administration of Customs, General Administration of Quality Supervision, Inspection and Quarantine, National Work Safety Supervision General Administration of Management  
Announcement on the entry into force of the "Stockholm Convention on Persistent Organic Pollutants" to add hexabromocyclododecane amendments, No.84 (2016)  
[http://www.mee.gov.cn/gkml/hbb/bgg/201612/t20161228\\_378327.htm](http://www.mee.gov.cn/gkml/hbb/bgg/201612/t20161228_378327.htm)  
[Google Scholar](#)
- [27] Ministry of Environmental Protection  
**Announcement on prohibiting the production, circulation, use, import and export of DDT, chlordane, mirex and hexachlorobenzene**  
Announcement (23) (2009)  
2009-04-16  
[http://www.mee.gov.cn/gkml/hbb/bgg/200910/t20091022\\_174552.htm](http://www.mee.gov.cn/gkml/hbb/bgg/200910/t20091022_174552.htm)  
[Google Scholar](#)



- [28] Ministry of Ecology and Environment, Ministry of Foreign Affairs, National Development and Reform Commission, Ministry of Science and Technology, Ministry of Industry and Information Technology, Ministry of Agriculture and Rural Affairs, Ministry of Commerce, National Health Commission, Ministry of Emergency Management, General Administration of Customs, State Administration of Market Supervision  
Announcement on the prohibition of the production, circulation, use, import and export of lindane and other persistent organic pollutants (2019-03-11). 2019-03-11  
[http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/201903/t20190312\\_695462.html](http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/201903/t20190312_695462.html)  
Google Scholar
- [29] Secretariat for the Rotterdam Convention.  
<http://www.pic.int/TheConvention/Chemicals/AnnexIIIChemicals/tabid/1132/language/en-US/Default.aspx>.  
Google Scholar
- [30] Wu Lihui, Qu Mengmeng, Wu Houbin, Bai Xiaoning  
**Impact of Rotterdam convention on China's pesticide export and recommendations for response**  
Pesticide Sci. Adm., 41 (12) (2020), pp. 26-30  
60  
Google Scholar
- [31] GEF  
**Environmentally sound management and disposal of obsolete POPs pesticides and other POPs wastes**  
<https://www.thegef.org/project/environmentally-sound-management-and-disposal-obsolete-pops-pesticides-and-other-pops-wastes>  
Google Scholar
- [32] GEF  
**PCB management and disposal demonstration**  
<https://www.thegef.org/project/pcb-management-and-disposal-demonstration>  
Google Scholar
- [33] GEF  
**Reduction of POPs and PTS release by environmentally sound management throughout the life cycle of electrical and electronic equipment and associated wastes in China**  
<https://www.thegef.org/project/reduction-pops-and-pts-release-environmentally-sound-management-throughout-life-cycle>  
Google Scholar
- [34] GEF  
**Building the capacity of the people's Republic of China to implement the Stockholm convention on POPs and develop a national implementation plan**  
<https://www.thegef.org/project/building-capacity-peoples-republic-china-implement-stockholm-convention-pops-and-develop>

[Google Scholar](#)

- [35] MEE  
**Announcement on issuing the "list of toxic chemicals strictly restricted in China**  
2019, No.60, 2019-12-31  
[http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/201912/t20191231\\_756318.html](http://www.mee.gov.cn/xxgk2018/xxgk/xxgk01/201912/t20191231_756318.html) (2020)  
[Google Scholar](#)

- [36] MEE  
**National hazardous waste list**  
<http://www.mee.gov.cn/xxgk2018/xxgk/xxgk02/202011/W020201127580349845528.pdf>  
[Google Scholar](#)

---

Cited by (0)

Peer review under responsibility of KeAi Communications Co., Ltd.

© 2022 The Authors. Publishing services by Elsevier B.V. on behalf of KeAi Communications Co. Ltd.



ELSEVIER

Copyright © 2022 Elsevier B.V. or its licensors or contributors.  
ScienceDirect® is a registered trademark of Elsevier B.V.

 RELX™