

Polybrominated Diphenyl Ethers(PBDEs) in Plastics

Dr. Chen Yuan, Prof. Li Jinhui

Basel Convention Regional Centre for Asia and the Pacific Stockholm Convention Regional Centre for Capacity-building and the Transfer of Technology in Asia and the Pacific **(BCRC China)**

CONTENTS 目録 01



PBDEs Management at Different Level

03

02

BCRC China's Work on PBDE

Basel/Stockholm Convention Regional Centre for Asia and the Pacific

Article 14 of Basel Convention: The Parties agree that, according to the specific needs of different regions and subregions, regional or sub-regional centres for training and technology transfers regarding the management of hazardous wastes and other wastes and the minimization of their generation should be established.



4 of the 14 Basel Convention Regional Centers are in the Asia-Pacific region

Article 12 of Stockholm convention : That parties shall provide...The performance...Arrangements, including capacitybuilding and technology transfer centres at the regional and subregional levels, to assist developing country and economies in transition parties to implement their obligations under the convention



5 of the 16 Stockholm convention regional centers are in in the Asia-Pacific region

There were comprehensive assessments of the performance and sustainability of the 14 BCRCs and 16 SCRCs worldwide in the COPs in 2015 and 2019. BCRC China has scored a full mark of 100 on both assessments. It is the only one in the world with the highest evaluation score.

Production & application of PBDEs

PBDEs have been used since 1970s, and countries of production are:

- C-PentaBDE was produced mainly in Israel, Japan, the United States, the European Union and China(<u>UNEP</u> <u>2010a</u>).
- C-OctaBDE was produced in the Netherlands, France, the United States, Japan, the United Kingdom and Israel.
- 3. The production of c-DecaBDE was estimated at over 1.1 million tonnes until 2005. Since 2005, the production of DecaBDE has been about 100,000 tons in the world.



PBDEs have been detected in electrical and electronic equipment, textiles,

automotive interior materials, building materials, and children's toys.

PBDEs under the Stockholm Convention

In May 2009, the Stockholm Convention on Persistent Organic Pollutants (POPs) was amended by the Conference of the Parties (COP) to the Convention to include several polybrominated diphenyl ethers (PBDEs) in its <u>Annex A</u>:

- Hexabromodiphenyl ether and heptabromodiphenyl ether \succ
- Tetrabromodiphenyl ether and pentabromodiphenyl ether
- From 24 April to 5 May 2017, taking note of the recommendation by the Persistent Organic Pollutants Review Committee that decabromodiphenyl ether (BDE-209) of c-decaBDE be listed in Annex A to the Convention.

റ

ethers (PBDEs)

Br_n



PBDE management in the world

	1970's PBDEs production and use		
	1989	1990	
Germany and Netherlands initiatively phased out the sale of PBDEs-conta	/ ining articles 1992	Japan voluntarily stopped production of commercial PentaBDE	
PBDEs Included in priority pollutants of action plan for the protection of the marine environment of the northeastern Atlantic 1998		1997 15 original European Union countries stopped production of commercial PentaBDE	
PBDEs Included in priority chemicals inver the protection organization of the marine environment of the northeastern Atlantic	ntory of 2004	2003 Rotterdam Convention listed PentaBDE as controlled chemicals	
European Union countries banned articles cor than 0.1% Penta and OctaBDE from markent China issued measures and requirements related to PBDEs	ntaining more 2006	2005 Japan voluntarily stopped importation and sell OctaBDE 2007	
Tri-BDEs to DecaBDEs were listed in the hazardous substance inventory of Canadian environmental protection law	2009	Sweden limited use of DecaBDE in textiles; furniture and e-products Canada prohibited all production of PBDEs Norway banned use of PBDEs in consumer article	
Commercial PentaBDE and OctaBDE were listed POPs inventory of the Stockholm Convention	l in the 2012	Maine and Washington U.S.prohibited use of PBDEs in mattresses and furniture	
rgest commercial producers and suppliers of Deca I States agreed to phase out use of the chemical b	BDE in the y 2012.	The European Chemicals Agency proposed a restriction on DecaBDE	

BCRC China work on PBDEs



On 17 February, 2016

China Trust fund project "Capacity-**B**uilding for Environmentally Sound Management (ESM) of Polybrominated **D**iphenyl Ethers (PBDEs) and Their Waste in Selected Asia-Pacific Countries"

- Feasibility study on separation of PBDEs containing waste from • the general waste stream.
- Generate awareness on PBDEs management ٠
- Establish an information platform on PBDEs management and ٠ operational activities



On 27 November 2015



On 16 December, 2015

Technologies on PBDEs containing plastic sorting

Dry method

- light separation;
- electrostatic separation;
- wind power separation.

➤ Wet method

- density separation;
- sink and float separation.



Not suitable for black plastic polymers. For the flame retardant plastic sorting, only some parameters need to be set up, then the device will automatically separate the plastic.



According to different densities of polymers, using liquid media with appropriate densities can separate.



Experienced workers observe the appearance of the plastic characteristics to distinguish whether plastic containing flame retardant by touch, eyes view

Sino-Norwegian cooperation project on capacity building for reducing plastic and microplastic pollution



• Partners:

Norway side:

- Norwegian Environment Agency (NEA)
- Norwegian Institute for Water Research (NIVA)

China side:

- MEE (Applicant)
- Basel Convention Regional Centre for Asia and the Pacific (BCRC China) (Executing unit)
- Solid Waste and Chemical Management Center (SCC MEE)
- National Maritime Environmental Monitoring Centre (NMEMC MEE)
- State Key Laboratory of Estuarine and Coasta Studies of East China Normal University

Studies of East China Normal University Bugdet (BRILEES bed (INDIM) Norway: 26 mill

• Timeline: 3.5 years,



THANK YOU !



扫描上方二维码关注我们吧

联合国环境署巴塞尔公约亚太区域中心

Basel Convention Regional Centre for Asia and the Pacific 斯德哥尔摩公约亚太地区能力建设与技术转让中心 Stockholm Convention Regional Centre for Capacity-building and the

Transfer of Technology in Asia and the Pacific

地址:清华大学环境学院 Address: School of environment, Tsinghua University Tel: +86 10 62794351 Fax: +86 10 62772048 Website: <u>http://ch.bcrc.cn/</u>

Email: zhaonana@tsinghua.edu.cn, bccc@tsinghua.edu.cn