

Enhancing environmental performance in the expanded and extruded polystyrene foam industries in Türkiye TECHNICAL WORKSHOP, 17.01.2024



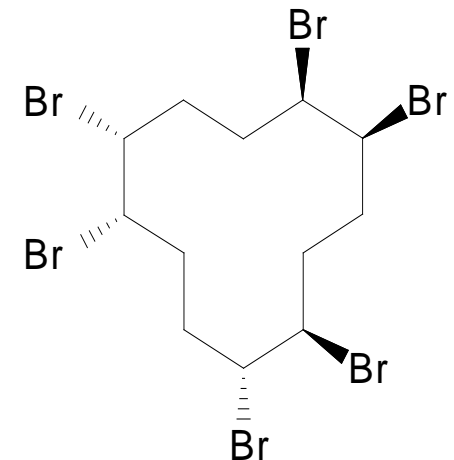
An Introduction to and Achievements of the GEF Project: “Improvement of the Environmental Performance of the Foam Sector: Phase out and Management of Hexabromocyclododecane in China”

Mujie Wang¹, Shaokun Yu¹, Zheng Peng¹, Carmela Centeno², Roland Weber^{3*}

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² United Nation Industrial Development Organisation, Vienna, Austria

³ POPs Environmental Consulting, Schwäbisch Gmünd, Germany



34 POPs listed in the Stockholm Convention (05/2023)

Chemical	Pesticides	Industrial chemicals	Unintentional production	Annex
<i>DDT</i>	+			B
Aldrin, Dieldrin, Endrin, Chlordane, Chlordecone, Toxaphene	+			A
Alpha-, Beta-, Gamma-HCH	+		By-product of lindane	A
Endosulfan, Heptachlor, Mirex	+			A
PCP, Dicofol, Methoxychlor	+	+		A
Commercial PentaBDE		+		A
Commercial OctaBDE (Hexa/HeptaBDE)		+		A
Commercial DecaBDE		+		A
Hexabromobiphenyl (HBB)		+		A
Hexabromocyclododecane (HBCD)		+		A
PFOS, its salts and PFOSF	+	+		B
PFOA and related compounds				
PFHxS and related compounds		+		A
SCCPs, Dechlorane Plus		+		A
UV-328		+		A
PCB, PeCBz, HCB, PCN, HCBD	+	+	+	A/C
PCDD, PCDF			+	C

HBCD has been listed in the Stockholm Convention in 2013 with exemption of use of HBCD in EPS/XPS insulation.

Of the 700,000 t produced more than 90% has been used in EPS/XPS foam for insulation in housing and construction. (Li et al. 2023)

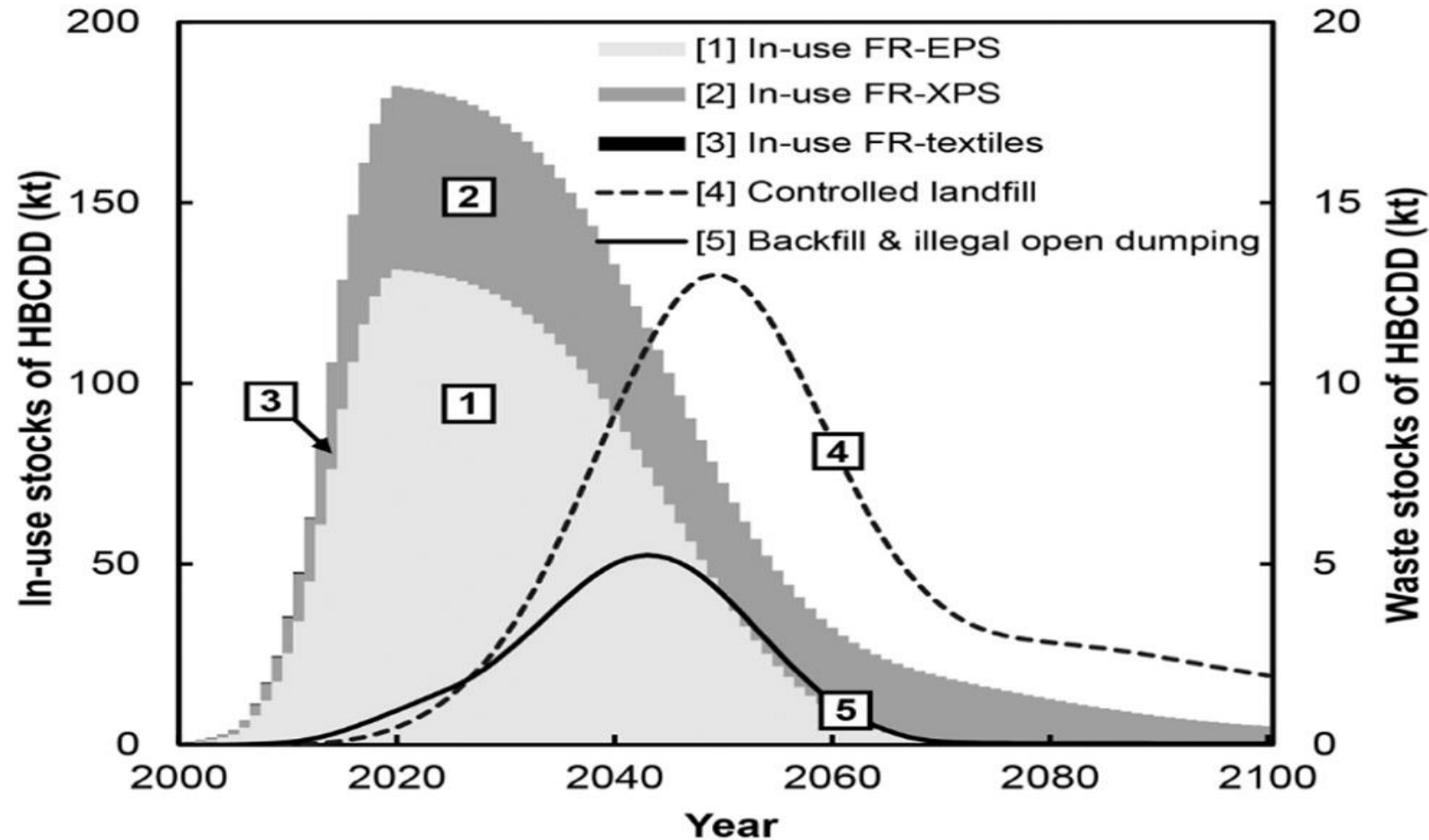
Considering an average use of ~1.5% HBCD in PS foam, this translates to **a global past production of ca. 42 million tonnes of HBCD containing EPS/XPS. Due to the long service life of EPS/XPS insulation of 30 to 50 years and longer thus is largely still present in buildings.**

Obligation under the Convention for HBCD

- **Production and use of HBCD was allowed** for the specific exemption of **insulation in construction (registration)**:. “Each Party that has registered for the exemption pursuant to Article 4 for the production and use of HBCD for expanded polystyrene and extruded polystyrene in buildings shall take necessary measures to ensure that expanded polystyrene and extruded polystyrene containing hexabromocyclododecane can be easily identified by labelling or other means throughout its life cycle.” (decision SC-6/13 and SC text)
- **Continued use of HBCD containing materials is allowed** (e.g. EPS/XPS containing HBCD need not to be removed from buildings).
- **Recycling of articles containing HBCD is not allowed** (e.g. for EU with limit of 100 mg/kg).
- **China was the last producer of HBCD and had an extended exemption until 12/2021.**

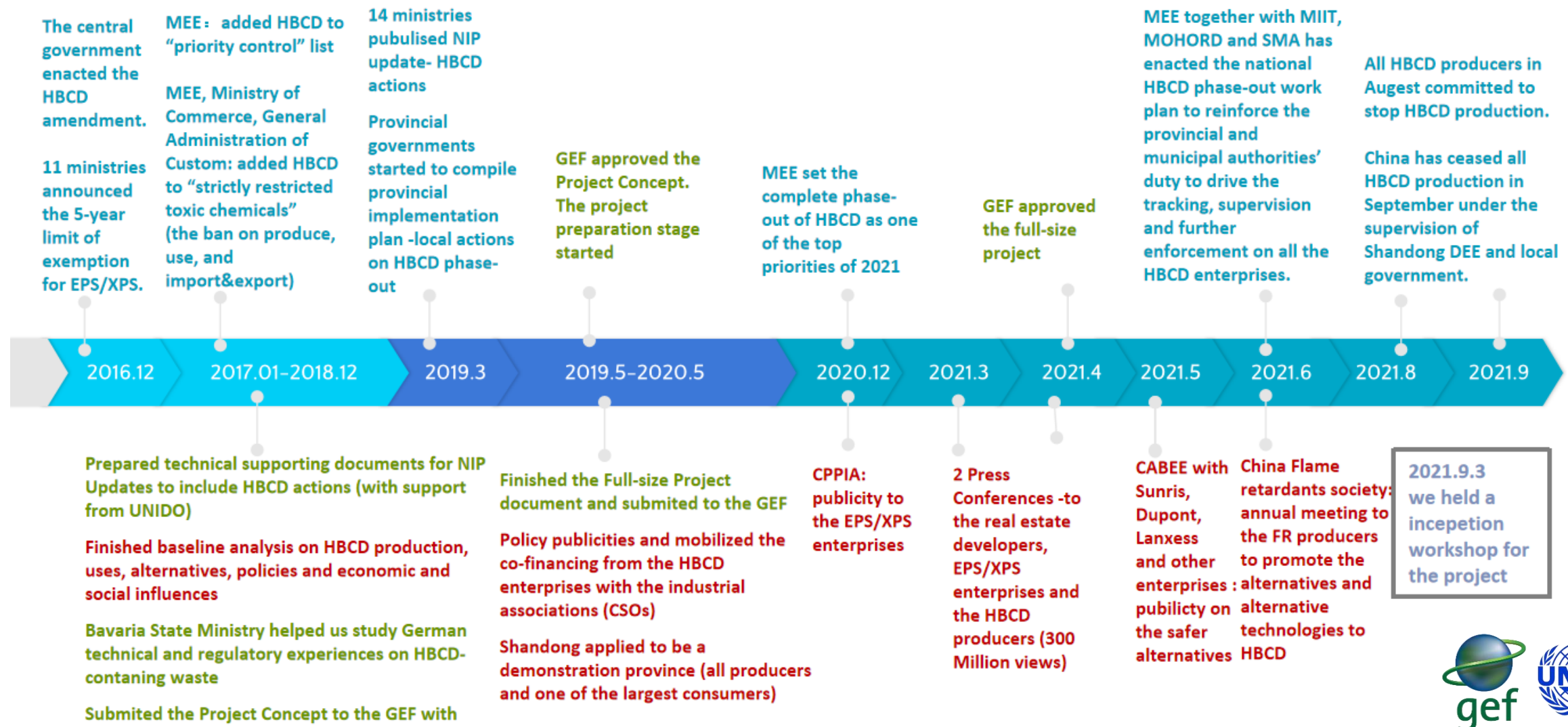
China had a large HBCD production, use and stock

- China consumed from 2000 to 2021 approx. 180,000 t of HBCD in EPS/XPS
- Assuming an average 1.5% of HBCD in EPS/XPS a total of 12 Mt of HBCD containing EPS/XPS
- The last 8 HBCD production facilities were located in China with production of ~18,000 t in 2017.



Project background and objectives

In order to promote the elimination of HBCD in China, the Foreign Environmental Cooperation Center of the Ministry of Ecology and Environment (FECO-MEE) and UNIDO developed the Global Environment Facility (GEF) project “Improvement of the Environmental Performance of the Foam Sector: Phase-out and Management of HBCD in China”.



Blue: administrative interventions Red: national technical and policy support Green: international support



Project background and objectives



To improve the environmental performance of the foam sector in China through the phase-out, introduction of HBCD alternatives and environmentally-sound management of HBCD-containing EPS/XPS foams.

内容一、制定政策和法规框架

Component 1: Policy and regulatory framework

内容二、促进技术转让和投资于生产HBCD的替代品和XPS/EPS泡沫塑料行业替代品的应用

Component 2: Promotion of technology transfer and investment on the production of HBCD alternatives and application of alternatives to the XPS/EPS foam sector

内容三、对含HBCD的废XPS/EPS泡沫进行环境无害化管理

Component 3: Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes containing HBCD

内容四、信息传播能力建设及知识管理

Component 4: Information dissemination, capacity building and knowledge management



Component 1: Policy and regulatory framework



Output 1.1.1: National legislation, regulatory framework and technical specifications to ban the production, usage, import and export of HBCD used in EPS/XPS in China

On July 2nd, 2016, the 21st session of the 12th Standing Committee of the National People's Congress of China reviewed and approved the Amendment, prohibiting the production, use, and import and export of HBCD, but retains its specific exemptions for the production and use of EPS and XPS in buildings, which ended on December 25th, 2021. (Announcement No. 84 of 2016)

环境保护部
外交部
国家发展和改革委员会
科学技术部
工业和信息化部
财政部
住房和城乡建设部
商务部
海关总署
国家质量监督检验检疫总局
国家安全生产监督管理总局

公告

公告 2016年 第84号

关于《〈关于持久性有机污染物的斯德哥尔摩公约〉新增列六溴环十二烷修正案》生效的公告

商务部
海关总署
生态环境部

Import and Export Policies

商务部公告2023年第21号

商务部 海关总署 生态环境部关于公布《禁止进口货物目录（第八批）》和《禁止出口货物目录（第七批）》的公告

为保护人的健康和生命安全，保护环境，履行《关于持久性有机污染物的斯德哥尔摩公约》，依据《中华人民共和国对外贸易法》《中华人民共和国药品管理法》《中华人民共和国货物进出口管理条例》，现公布《禁止进口货物目录（第八批）》和《禁止出口货物目录（第七批）》。

本公告自发布之日起施行。用于实验室规模的研究或用作参考标准的，不适用本公告禁止进出口相关要求。

附件：1.禁止进口货物目录（第八批）

2.禁止出口货物目录（第七批）

商务部 海关总署 生态环境部

2023年6月6日

9	2903890020	六溴环十二烷	25637-99-4 3194-55-6 134237-50-6 134237-51-7 134237-52-8
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Component 1: Policy and regulatory framework



Output 1.1.1: National legislation, regulatory framework and technical specifications to ban the production, usage, import and export of HBCD used in EPS/XPS in China

A national action plan



Including in the list of emerging pollutants under key regulation

编号	新污染物名称	CAS号	主要环境风险管控措施
14.	已淘汰类（六溴环十二烷、氯丹、灭蚁灵、六氯苯、滴滴涕、α-六氯环己烷、β-六氯环己烷、林丹、硫丹原药及其相关异构体、多氯联苯） ¹	—	继续施行： (1) 禁止生产、加工使用、进出口。 (2) 已禁止使用的，或者所有者申报废弃的，或者有关部门依法收缴或接收且需要销毁的已淘汰类新污染物，根据《国家危险废物名录》或者危险废物鉴别标准判定属于危险废物的，应当按照危险废物实施环境管理。 (3) 已纳入土壤污染风险管控标准的，严格执行土壤污染风险管控标准，识别和管控有关的土壤环境风险。

National statistical investigation system



Procurement Guideline of “No HBCD policy” added to Green Procurement Guideline

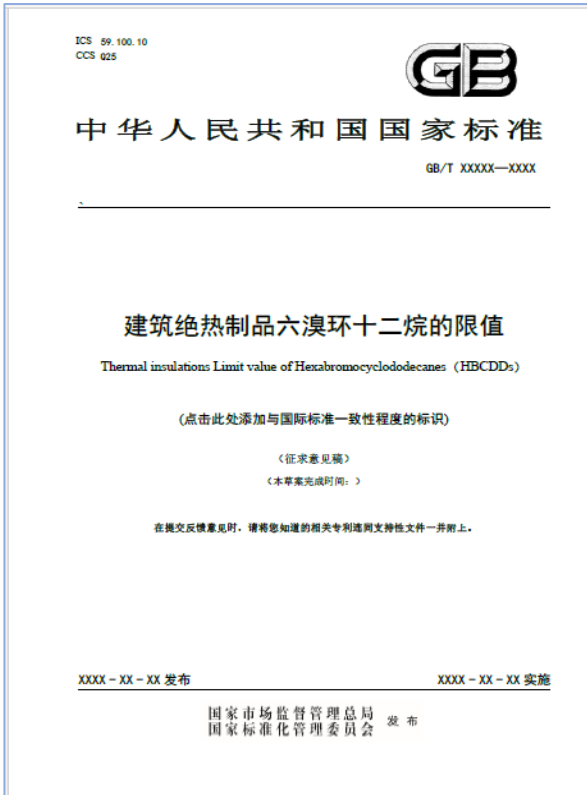
12月29日，2021年绿色采购委员会会议在上海召开。会议回顾了绿行行动工作进展，并针对拓展与采购平台的合作、启动“绿色采购”和绿色采购平台建设等议题，广泛征求各方意见，明确下一阶段工作重点。会议还审议了2021年绿行行动的工作计划。



Component 1: Policy and regulatory framework



Output 1.1.2: Regulatory policies developed to reduce and eliminate the application of HBCD in EPS/XPS polymer foams, with focus on environmental quality standards and chemical limits of HBCD in EPS/XPS polymer foams and all potential HBCD users



建筑领域 BUILDING

建筑绝热制品**HBCD**含量
不大于**100 mg/kg**
HBCD content of
building thermal
insulation products is
not more than 100
mg/kg



团体标准

CPPIA-35-20-TC-002

模塑聚苯乙烯泡沫塑料和挤塑聚苯乙烯泡沫塑料中六溴环十二烷的测定
气相色谱-质谱法

中国塑料加工工业协会 发布

塑料领域 PLASTIC

实现对**HBCD**相关产品的监管
Enabling the supervision
of the HBCD content
product.



Component 1: Policy and regulatory framework



Output 1.1.3: Framework for governmental alternative assessment established and flame retardant alternatives for HBCD and alternative insulation materials for HBCD-containing EPS/XPS foams evaluated

(1) Establishment of environmental risk assessment methodologies for HBCD alternatives

The alternative environmental risk assessment methods of UNEP, US EPA, OECD and other institutions were investigated.

(2) Laboratory testing for brominated SBS

According to the needs of hazard comparison assessment indicators and environmental risk assessment, laboratory studies on acute toxicity and chronic toxicity of fish.

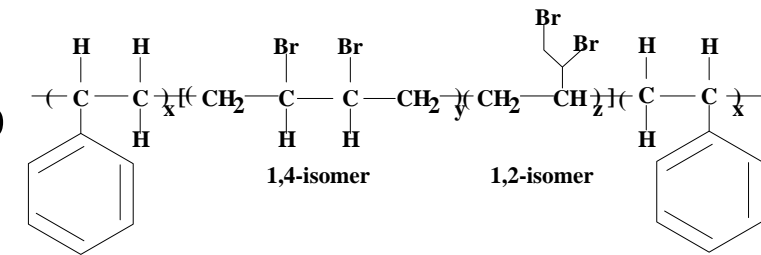
(3) Monitoring of environmental concentrations of TBBPA-bis brominated ether derivative emission point sources

The field research on enterprises and sewage treatment plants were carried out recently, and the monitoring plans were formulated.

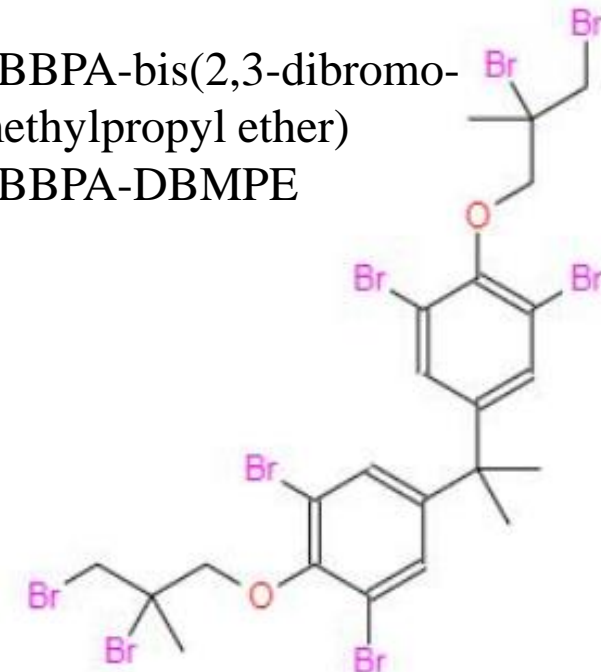
(4) Alternative data collection

The latest control progress of brominated SBS and TBBPA-bis brominated ether in the domestic and foreign arena was investigated, and the related data compiled.

(5) Hazard assessment Quality of collected hazard data of two alternatives was evaluated



TBBPA-bis(2,3-dibromo-
methylpropyl ether)
TBBPA-DBMPE



Component 1: Policy and regulatory framework



Output 1.1.4: National managerial capacity, enforcement, supervision policies, monitoring methods of HBCD and HBCD-containing products strengthened to coordinate and monitor and establish problem-finding mechanism for the polymer foam production sector

National Capacity Building



National Coordination Group for Stockholm Convention Implementation



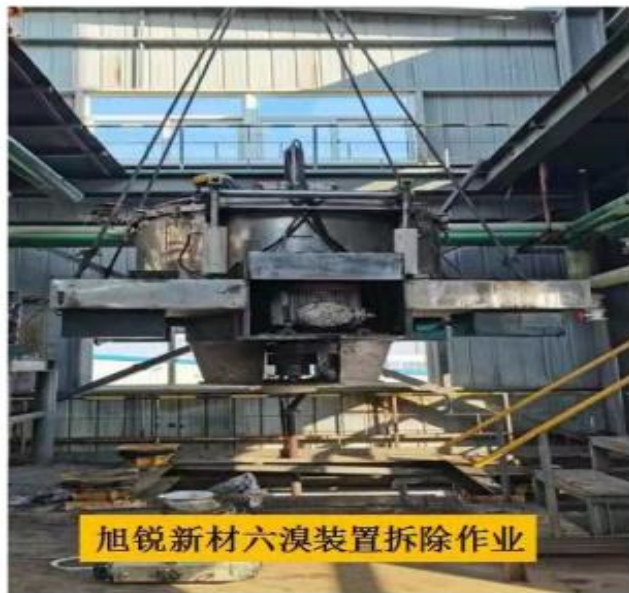
Coordination Meetings on 2022

Component 2: Promotion of technology transfer and investment in the production of HBCD alternatives



Output 2.1.1: HBCD production lines closed down or converted to HBCD alternatives

HBCD Dismantling and cleaning up the production lines



旭锐新材六溴装置拆除作业



山东东信新材料科技股份有限公司



经度: 118.830943
纬度: 37.199389
地址: 山东省潍坊市寿光市北海路7号岱星
化工
时间: 2021-10-27 16:25:35
海拔: 55.5米
天气: 21~19°C 西北风
备注: 1

寿光市宝宝化工科技有限公司

Component 2: Promotion of technology transfer and investment in the production of HBCD alternatives



Output 2.1.1: HBCD production lines closed down or converted to HBCD alternatives

Production TBBPA-DBMPE and Brominated SBS polymer



Supervision by Shandong Department of Ecology and Environment

Demonstration Plant 1

Stop HBCD Production and Transform to producing alternatives

Demonstration Plant 2

Stop HBCD

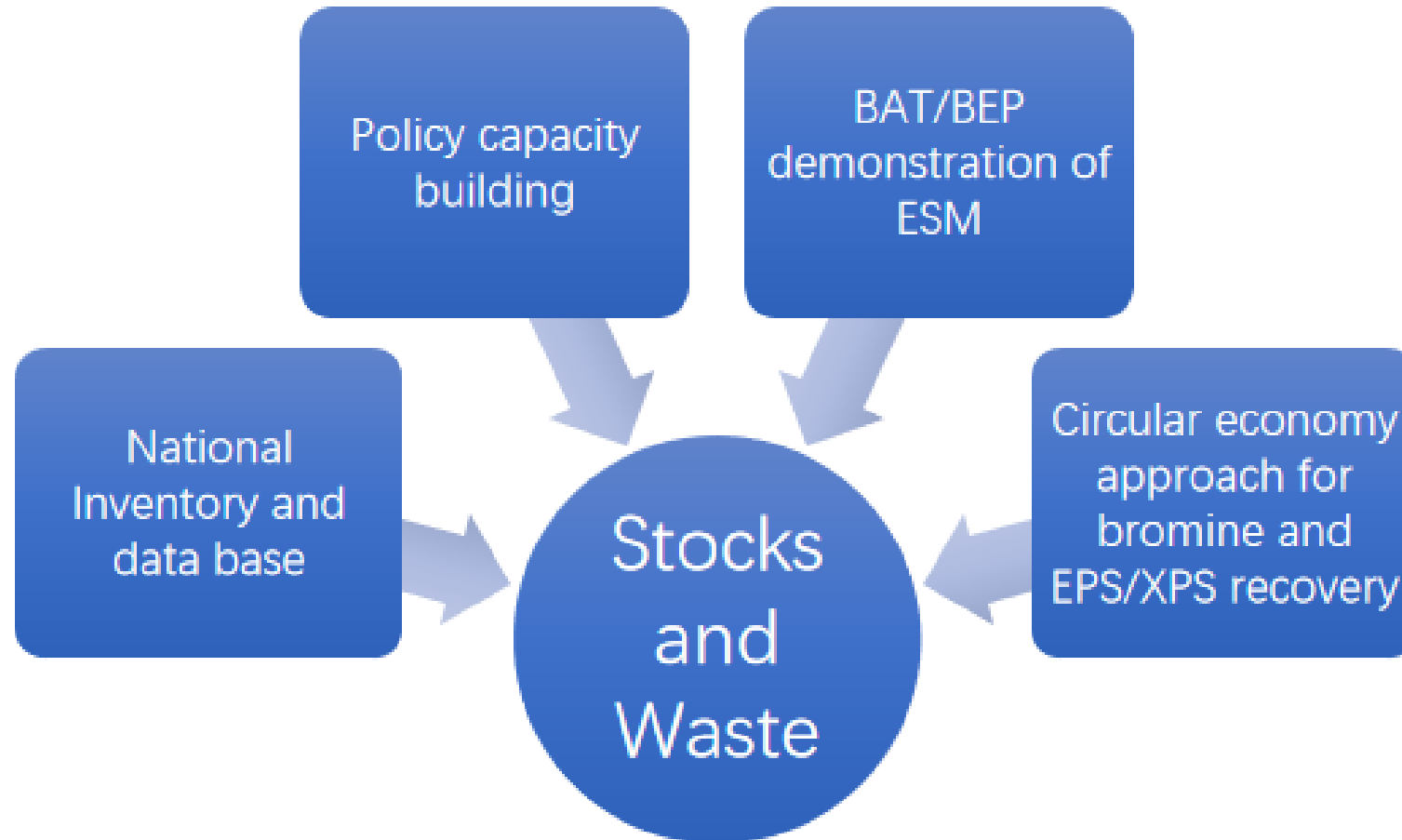
Demonstration Plant 3

Stop HBCD Production and Transform to producing alternatives

Component 3: Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes



Overview Component 3



Component 3: Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes



Output 3.1.2: Develop HBCD waste identification and management methods on HBCD and HBCD-containing wastes disposal

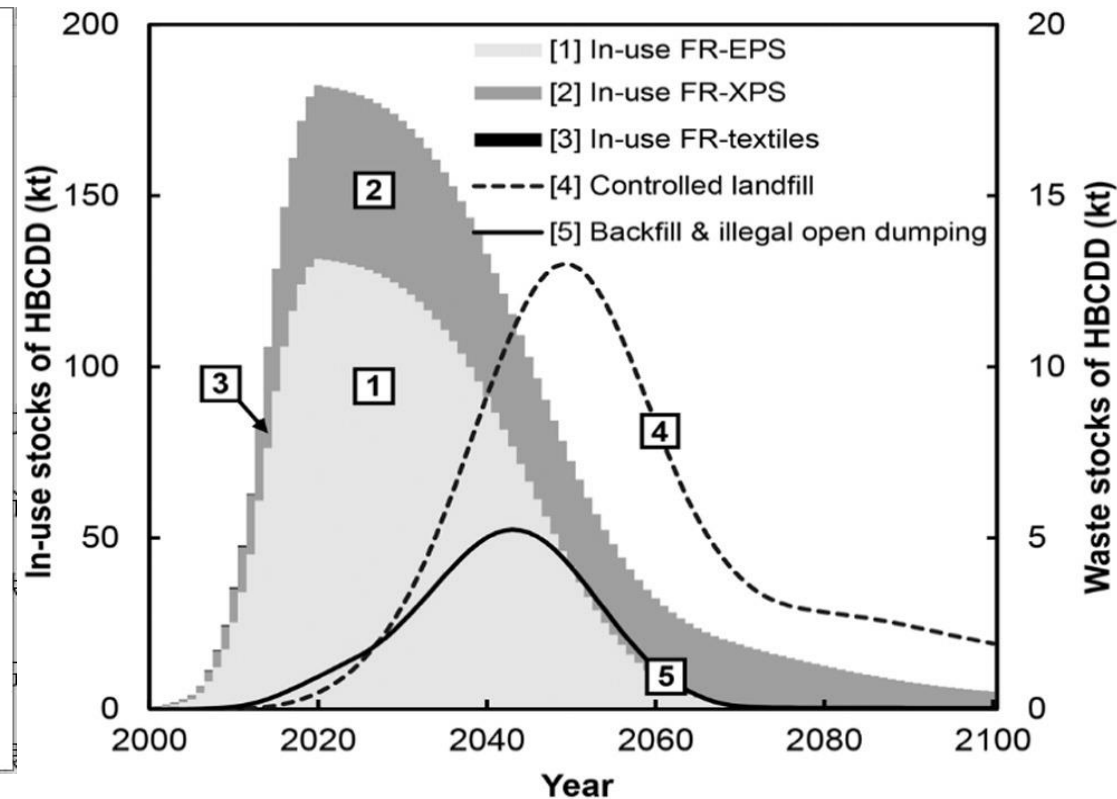
Building identification method for insulation materials containing HBCD



Expert Discussion



HBCD Quick Recognition Program



Component 3: Implementation of environmentally-sound management (ESM) of EPS/XPS foam wastes



Output 3.1.3 BAT/BEP demonstration of environmentally sound management and disposal of HBCD waste including assessment, comparison and demonstration of different treatment technologies, including volume reduction, HBCD extraction, HBCD decomposition, disposal, circular economy approach for bromine and EPS/XPS recovery

Municipal waste incineration co-treatment

(Demonstration conducted with selected implementation partners for MWI destruction)

Cement kiln co-processing

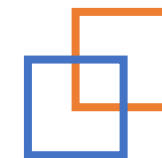
(Demonstration conducted with selected implementation partners for cement kiln destruction)

Hazardous waste incineration

(Demonstration conducted with selected implementation partners for HWI destruction)

项目工作进展情况

Progress of HBCD Project



Output 4.1.1: Technical trainings for various stakeholders (enterprises, government staff, technicians, researchers etc.) designed and implemented to strengthen capacity on substitution in the HBCD and the EXPS/EPS foam sector, in general.

Social and Economic Impact of the Gender Mainstreaming on the HBCD related Industries



项目工作进展情况

Progress of HBCD Project



Output 4.1.2: Awareness raising activities undertaken for various relevant stakeholders including the general public, NGOs, women and youth sector etc.



Press Conference- HBCD prohibition in the green building area



Press Conference- Phasing out HBCD in the Plastic Industries



Polymeric Flame Retardant Symposium held by the CABEE



HBCD phaseout, alternative and waste management symposium, hosted by FECO/MEE



Training Workshop to the stakeholders in Shandong Province



HBCD promotional leaflets—copyright by CPPIA

Invited by PINFA China, attended an industry live broadcast in June 2020, watched over 3000 times

中国 HBCD 禁令要求:

自 2016 年 12 月 26 日起, 禁止 HBCD 的生产、使用和进出口。用于建筑物保温材料 XPS 和 EPS 阻燃剂的 HBCD 获得了 5 年豁免期, 豁免期将于 2021 年 12 月 25 日终止。



1 提前准备关闭 HBCD 生产线。

2 规范处理含 HBCD 的危险废物 (包括库存)。

“我是 HBCD 生产企业, 为配合履约工作我应该怎么做?”

3 2020 年 12 月 26 日起, 不能买卖或出口 HBCD。

4 做好替代阻燃剂的新化学物质登记手续。

“我是 HBCD 使用企业, 为配合履约工作我应该怎么做?”

1 停止购买和使用 HBCD。

2 2021 年 12 月 26 日起, 不得买卖或出口 HBCD 和含 HBCD 的产品。

3 提前准备, 规范处理含 HBCD 的产品库存 (废物)。

《新化学物质环境管理登记办法》自 2021 年 1 月 1 日起施行。原环境保护部 2010 年 1 月 19 日发布的《新化学物质环境管理辦法》(环境保护部令 7 号) 同时废止。

中国化学品法规的重大变化如下:

1. 明确了企业评估和控制新化学物质环境风险的责任。
2. 申请人应开展新化学物质高危害性判别, 包括持久性、生物累积性和毒性, 高持久性和高生物累积性。
3. 办理高危害化学物质的常规登记和新用途环境管理登记时, 申请人需提交社会经济效益分析报告材料。
4. 建立新化学物质登记后的跟踪管理系统以监管。
5. 登记的作用与欧盟 REACH 法规下的注册相似, 后期评估也包含了 PBT 测试和环境社会影响分析 (与 REACH 和 POPs 公约接轨)。

16

2022年6月30日直播预告/淘汰六溴环十二烷(HBCD)工作进展及POPs类阻燃剂管控趋势

原创 Pinfa 中国 Pinfa 中国无卤阻燃
2022-06-24 15:26 发表于浙江



Pinfa 中国特别邀请生态环境部对外合作与交流中心项目主管王昊杨做客直播间, 为大家介绍淘汰六溴环十二烷 (HBCD) 工作进展及 POPs 类阻燃剂管控趋势。

01

【直播时间】

2022年6月30日 (周四)
15:00-16:00

× Pinfa 中国无卤阻燃 > ...

【本期看点】

1. 淘汰六溴环十二烷 (HBCD) 的原因
2. HBCD 淘汰最新情况和现行重要约束政策
3. 示范项目进展简介
4. 从淘汰 HBCD 行动中得到的启示

04

【嘉宾介绍】



Dioxin 2023

10-14 SEPTEMBER

MAASTRICHT, THE NETHERLANDS



Presentation at the 43rd International Symposium on Halogenated Persistent Organic Pollutants (POPs);
September 10-14, 2023 | Maastricht, The Netherlands



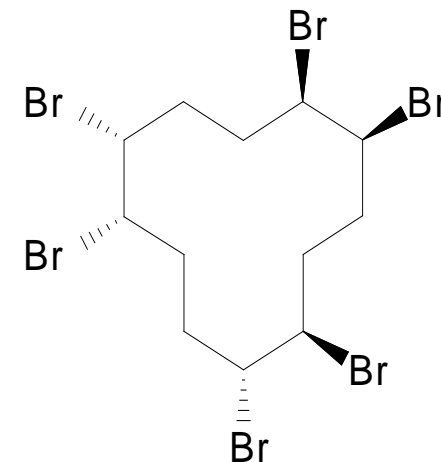
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³ POPs Environmental Consulting, Schwäbisch Gmünd, Germany



Thank you for your attention ! Questions?

More Information <https://www.thegef.org/projects-operations/projects/10163>

Basel Convention: www.basel.int

Rotterdam Convention: www.pic.int

Stockholm Convention: <http://chm.pops.int/>

Montreal Protocol/Vienna Convention: <http://ozone.unep.org>

FAO: www.fao.org **WHO** www.who.int/ **SAICM:** www.saicm.org/

Alternatives https://www.subsportplus.eu/subsportplus/EN/Home/Home_node.html

OECD/IOMC: <http://www.oecd.org/chemicalsafety/>

Science: www.ipcp.ch; <http://greensciencepolicy.org/>; www.unep.org/oewg-spp-chemicals-waste-pollution

Industry: <http://www.suschem.org/>; <https://icca-chem.org/>; <https://cefic.org/>

NGO: www.ipen.org; www.ciel.org/; www.ban.org; www.chemsec.org; www.wecf.org; <https://chemtrust.org/>

Better-world-links: <http://www.betterworldlinks.org/>

