For discussion
31 March 2025

LEGISLATIVE COUNCIL
PANEL ON ENVIRONMENTAL AFFAIRS

The Third Hong Kong Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants

INTRODUCTION

This paper seeks to brief Members on the latest developments on the control of Persistent Organic Pollutants (POPs) in Hong Kong and the updating of the Hong Kong Implementation Plan for the Stockholm Convention on Persistent Organic Pollutants (the Convention).

BACKGROUND

2. POPs are chemicals that can remain in the environment for a long period of time, capable to migrate throughout the global environment, accumulate in the body of living organisms and elicit harmful effects to humans and the wildlife. The Convention is an international environmental treaty that aims to protect human health and the environment from harmful effects of POPs. The People's Republic of China (China) is a Party to the Convention which became effective in China on 11 November 2004, and became applicable as well to the Hong Kong Special Administrative Region (HKSAR).

3. In implementing the Convention, Parties to the Convention need to take measures to control or restrict the trade, production and use of POPs, as well as to reduce and ultimately eliminate the intentional production of POPs and the release of unintentionally produced POPs [1]. The 12 initial POPs[2] were identified when the Convention entered into force in 2001 and

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[1] "Unintentionally produced" refers to the production of by-products or impurities during the processes of producing pesticides or industrial chemicals, incomplete combustion or chemical reaction. Unintentionally produced POPs include polychlorinated dibenzo-p-dioxins/polychlorinated dibenzofurans (dioxins/furans) which are very toxic in nature.

[2] The 12 initial POPs include (i) aldrin; (ii) chlordane; (iii) dichlorodiphenyltrichloroethane; (iv) dieldrin; (v) endrin; (vi) heptachlor; (vii) hexachlorobenzene; (viii) mirex; (ix) toxaphene; (x) polychlorinated biphenyls; (xi) dioxins; and (xii) furans.

a total of 11 POPs[3] were added from the 4th to 6th meetings of the Conference of the Parties (COP) to the Convention.

4. For a total of 23 POPs above, after taking appropriate control measures (including enacting and enforcing legislations for controlling the import, export, manufacture and use of POPs etc. through a permit system) and implementing continuous environmental monitoring, the concentrations / contamination levels of these POPs (such as mean levels of POPs contamination in the ambient air) have broadly shown a decreasing trend. Their levels have been within a safe and acceptable level, and generally on par with those of other developed regions. Details are in the **Annex.**

5. As required under Article 7 of the Convention, each Party shall develop and implement a National Implementation Plan (NIP) for discharging its obligations under the Convention, and shall submit the NIP to the COP after the Convention has come into operation, which shall be reviewed and updated periodically as appropriate.

THE FIRST AND SECOND HONG KONG IMPLEMENTATION PLAN

6. We briefed and informed the Legislative Council (LegCo) Panel on Environmental Affairs (the Panel) on the first and second Hong Kong Implementation Plan (HKIP) in February 2006 and January 2016 respectively. For the second HKIP, we updated the source inventory, environmental levels, dietary exposure and human body burden of the 23 industrial chemical or pesticide POPs to provide a more comprehensive information for analysis and assessments. We also established a systematic and comprehensive monitoring of all listed POPs levels in the environment, locally consumed foods and human breast milk. In order to reduce emissions of unintentionally discharged POPs to the local environment, we have adopted the best available techniques and best environmental practices, including optimising the use of existing power generating capacity of gas-fired power plants and progressively phasing out old coal-fired generation units. Dedicated POPs thematic website was also developed to raise public

[3] The 11 POPs include: (i) alpha hexachlorocyclohexane; (ii) beta hexachlorocyclohexane; (iii) chlordecone; (iv) hexabromobiphenyl; (v) gamma hexachlorocyclohexane; (vi) pentachlorobenzene; (vii) perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride; (viii) hexabromodiphenyl ether and heptabromodiphenyl ether (commercial octabromodiphenyl ether); (ix) tetrabromodiphenyl ether and pentabromodiphenyl ether (commercial pentabromodiphenyl ether); (x) technical endosulfan and its related isomers; and (xi) hexabromocyclododecane.

awareness. In addition, we collaborated with the Mainland China to organise technical workshops and set up joint monitoring programme.

UPDATED HONG KONG IMPLEMENTATION PLAN

7. At the 7th and 8th meetings of the COP to the Convention held in 2015 and 2017 respectively, the Parties agreed to add 5 new POPs[4] to the Annexes of the Convention. China accepted the amendments to add these 5 POPs on 7 March 2023 and they became effective in China on 6 June 2023, which became applicable to HKSAR. The Hazardous Chemicals Control Ordinance (Cap. 595) (HCCO) and the Pesticides Ordinance (Cap. 133) were amended accordingly in July 2023 and the amended legislations became effective on 20 October 2023. As required under the Convention, China shall submit an updated NIP, which shall also include an updated HKIP (i.e. the third HKIP), by 6 June 2025 (i.e. within two years on which the amendments entered into force). In this connection, we have updated the second HKIP.

8. In the preparation of the third HKIP, we have adopted similar approach as for the preparation of the second HKIP, which are set out as below:

(a) consulting relevant government departments and conducting questionnaire surveys on relevant industrial operators, laboratories, traders, trade associations and the academia. We also conducted field surveys and interviewed them to gauge the use, trading and manufacturing of POPs listed in the Convention in Hong Kong;

(b) reviewing the latest POPs data available from government and academic sources and working out the estimated current environmental levels of POPs in Hong Kong; and

(c) assessing the risks associated with the current POPs level and reviewing the strategies and updating action plans for implementing the Convention as contained in the second HKIP.

9. As mentioned in paragraph 4 above, the assessment result indicated that the relevant impact and risks associated with POPs in Hong Kong are, as in the past, within an acceptable level and are generally on par

[4] The 5 new POPs include (i) pentachlorophenol and its salts and esters; (ii) hexachlorobutadiene; (iii) polychlorinated naphthalenes; (iv) decabromodiphenyl ether present in commercial decabromodiphenyl ether; and (v) short-chain chlorinated paraffins.

with those of other developed regions. The latest situation of implementing the Convention in Hong Kong is as follows:

(a) No import, export, manufacture, use, stockpiling nor transhipment of pesticide POPs in Hong Kong was found in the past few years. There was also no manufacturing of industrial chemical POPs in Hong Kong. Seven companies were found to be importing in total of about 10 grams industrial chemical POPs each year for providing laboratory testing service or for selling to other local laboratories;

(b) The level of POPs contamination in the local environment[5] was generally comparable to the ranges reported in most countries in Asia (e.g. South Korea, Japan), South and North America (e.g. the United States of America (USA), Brazil) and Europe (e.g. Germany, Sweden, Spain)[6];

(c) The current level of POPs contamination in the marine environment of Hong Kong did not cause any unacceptable ecological risk to local marine life;

(d) Levels of POPs in local marine biota were found to be well below national Food Safety Action Levels of the Mainland China as well as those of the USA and the European Commission[7], which complied with the relevant safety standards;

(e) According to the latest information available to us, on a per capita basis, the amount of dioxins/furans released as unintentionally produced POPs by-products in Hong Kong in 2020 as estimated by using the latest version of "Toolkit for Identification and Quantification of Releases of Dioxins, Furans and Other

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5 The contamination is caused by the release and accumulation of unintentionally produced POPs (dioxins/furans) from anthropogenic sources to the environment (e.g. incineration). As POPs can migrate (e.g. water flow, wind and food chains etc.) and remain intact in the environment for a very long time which are hard to degrade, this "background" POPs may not necessarily be generated in Hong Kong.

6 Latest data from 2022 indicated that the mean local ambient air dioxins/furans concentration was 0.011 pg I-TEQ m^{-3}, which is comparable to the ranges reported in most countries, like Spain (0.012 pg I-TEQ m^{-3}), Japan (0.015 pg WHO-TEQ m^{-3}), the USA (0.0111 pg WHO-TEQ m^{-3}) and Brazil (0.015 pg I-TEQ m^{-3}) where "pg I-TEQ m^{-3}" stands for "picogram international toxic equivalents per cubic metre" and "pg WHO-TEQ m^{-3}" stands for "picogram World Health Organization toxic equivalents per cubic metre".

7 The levels of POPs contamination in marine fish and crustacean from Hong Kong waters were found to be below the Food Safety Action Levels set by the USA and the European Commission by 1-2 orders of magnitude, which complied with the relevant safety standards.

Unintentional POPs" (the "Toolkit") published by the United Nations Environment Programme (UNEP) was generally similar to that of the USA, Spain, Australia, South Korea and the European Union (EU) countries[8];

(f) Dietary exposure of local residents to dioxins/furans and dioxin-like polychlorinated biphenyls (PCBs) was estimated to be well below the World Health Organization's Provisional Tolerable Monthly Intake[9]. Dietary intake was the major route, accounting for 99.2% of total exposure (dietary and inhalation), of local residents to dioxins/furans and dioxin-like PCBs; and

(g) There was no unacceptable chronic/carcinogenic risk associated with a lifetime inhalation or dietary exposure to the current levels of the regulated POPs contamination in the local environment and in locally consumed foods.

10. As stated in the second HKIP, we have formulated strategies and action plans to effectively implement the Convention in Hong Kong. In preparing the third HKIP, we have reviewed and updated our recent initiatives and all action items contained therein which are summarised as follows:

(a) On updating relevant ordinances, the HCCO and Pesticides Ordinance were amended in 2023 accordingly as a result of China's acceptance in 2023[10] of the amendments at the 7th and the 8th meetings of the COP to the Convention in 2015 and 2017 respectively. The amended legislations became effective on 20 October 2023. We shall continue to update the HCCO and the Pesticides Ordinance in accordance with the Convention amendments and the Central People's Government's decision to ensure that all amendments to the Convention are timely and properly incorporated and implemented;

(b) On validation and refinement of POPs inventory, we have updated the source inventory, environmental levels, dietary exposure and human body burden of POPs with a view to providing more

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8 In 2020, Hong Kong's total annual dioxins/furans release per capita was 6 442 ng TEQ capita^{-1} which is of the same order of magnitude as those of the USA, Spain, Australia, South Korea and the EU countries, where "ng TEQ capita^{-1}" stands for "nanogram toxic equivalents per capita".

9 The intake of local residents is 14.44 pg TEQ/kg bw/month, while the World Health Organization's Provisional Tolerable Monthly Intake is 70 pg TEQ/kg bw/month, where "pg TEQ/kg bw/month" stands for "picogram toxicity equivalents per kilogram body weight per month".

10 See paragraph 7 above.

comprehensive and representative information for analysis and assessments. We shall continue to refine the local dioxins/furans source inventory by using the latest version of the "Toolkit" published by the UNEP to validate annual production activities and estimate the exposure levels;

(c) On systematic monitoring of POPs, we have built a comprehensive monitoring system and programme and provided the public with the available monitoring results of POPs on a regular basis through website. We shall continue to regularly and closely monitor POPs in the environment, locally consumed foods and human breast milk;

(d) On measures to reduce emissions of unintentionally produced POPs, we will continue to adopt the best available techniques and best environmental practices to control and reduce emissions of dioxins/furans from stationary sources to the local environment. We have tightened the dioxins/furans emission standards for crematoria under best practicable means and progressively phase out or replace old cremation units. We have also taken suitable measures when implementing integrated waste management strategy in accordance with the "Waste Blueprint for Hong Kong 2035", including the adoption of waste management hierarchy to prevent and minimise waste generation and proper treatment of clinical waste, chemical waste and unavoidable municipal solid waste. The Integrated Waste Management Facilities Phase 1 (I·PARK1) and Phase 2 (I·PARK2) will adopt advanced incineration technology and flue gas treatment and monitoring system to ensure compliance with the stringent emission standards, including combustion zone's operating temperature not lower than 850 degree Celsius and at least 2 seconds flue gas residence time, etc.

(e) On enhancing public awareness, we have timely updated the dedicated POPs thematic website to update all POPs listed in the Annexes of the Convention and incorporate the second HKIP. We shall continue to timely update the dedicated website when new POPs are added to the Convention and once the updated HKIP is available in the future; and

(f) Regarding regional collaboration with the Mainland China, we will maintain communication with the Mainland counterparts on the monitoring of POPs and conduct joint regional POPs monitoring on a project basis when necessary. We will continue to strengthen regional collaboration with the Mainland China to promote the standardisation of monitoring and enhance information exchange

and knowledge.

PUBLIC CONSULTATION

11. We organised a consultation session on updating the second HKIP on 6 August 2024. About 60 stakeholders from different sectors including the academia, trade associations and industries utilising POPs in their businesses attended the consultation session. The workshop was well-received and the attendees acknowledged and recognised the effectiveness of the workshop. The attendees only raised a few enquiries on issues relating to the control of POPs newly listed in the Convention, such as the impact of controlling POPs on the use of hazardous chemicals in university laboratories.

ADVICE SOUGHT

12. Members are invited to offer views on the above.

Environment and Ecology Bureau
Environmental Protection Department
March 2025

Annex

Mean Levels of POPs Contamination in the Ambient Air of Hong Kong in Year 2014, 2018 and 2022

Chemicals		Average Concentration in Ambient Air (pg/m3) [Mean]		
		2014	**2018**	**2022**
Aldrin		BDL	3.93	BDL
Chlordane	cis-Chlordane	1.59	2.83	BDL
	trans-Chlordane	1.62	1.43	BDL
	cis-Nonachlor	BDL	BDL	BDL
	trans-Nonachlor	BDL	2.50	BDL
	Oxychlordane	BDL	3.78	BDL
DDT	2,4'-DDD	BDL	6.28	BDL
	2,4'-DDE	1.19	8.67	BDL
	2,4'-DDT	BDL	2.63	BDL
	4,4'-DDD	BDL	BDL	BDL
	4,4'-DDE	5.94	5.93	2.60
	4,4'-DDT	3.85	BDL	BDL
Dieldrin		6.65	9.82	BDL
Endrin		BDL	BDL	BDL
Heptachlor	Heptachlor	BDL	4.15	BDL
	cis-Heptachlor epoxide	BDL	3.06	BDL
Hexachlorobenzene		39.45	39.98	50.54 Note
Mirex		1.71	1.43	BDL
Toxaphene	Parlar 26	BDL	BDL	BDL
	Parlar 50	BDL	BDL	BDL
	Parlar 62	BDL	BDL	BDL
PCBs	Dioxin like-PCBs (pg 2005 WHO-TEQ/m^3)	0.004	0.004	0.002
	Marker PCBs ∑PCB7	16.4	11.7	8.85
PCDDs (pg I-TEQ/m^3)		0.045	0.026	0.011
PCDFs (pg I-TEQ/m^3)				
α-Hexachlorocyclohexane		BDL	3.65	2.31
β-Hexachlorocyclohexane		2.18	BDL	BDL
Chlordecone		BDL	BDL	BDL
HBB	PBB153	N/A	3.02	3.02
γ-Hexachlorocyclohexane		5.40	7.68	1.66
Pentachlorobenzene		2.14	9.36	10.29 Note

Chemicals		Average Concentration in Ambient Air (pg/m3) [Mean]		
		2014	2018	2022
PFOS, its salt and PFOSF	Perfluorooctane sulfonic acid	2.10	7.00	7.27
C-octaBDE	BDE-153	N/A	81.12	3.02
	BDE-154	N/A	48.33	3.02
	Sum of BDE-183 & BDE-175	N/A	6.04	6.06
C-pentaBDE	BDE-47	N/A	3 346.68	3.02
	BDE-99	N/A	1 813.97	3.02
Technical endosulfan and its related isomers	α-Endosulfan	98.42	29.77	BDL
	β-Endosulfan	11.39	4.50	BDL
HBCD	α-HBCD	N/A	3.65	3.02
	β-HBCD	N/A	BDL	3.02
	γ-HBCD	N/A	3.32	3.02

BDL = Below detection limit
N/A = Not tested.
DDT = Dichlorodiphenyltrichloroethane
DDD = Dichlorodiphenyldichloroethane
DDE = Dichlorodiphenyldichloroethylene
PCBs = Polychlorinated biphenyls
PCDDs = Polychlorinated dibenzo-p-dioxins
PCDFs = Polychlorinated dibenzofurans
HBB = Hexabromobiphenyl
PFOS, its salt and PFOSF = Perfluorooctane sulfonic acid, its salts and perfluorooctane sulfonyl fluoride
C-octaBDE = Hexabromodiphenyl ether and heptabromodiphenyl ether (commercial octabromodiphenyl ether)
C-pentaBDE = Tetrabromodiphenyl ether and pentabromodiphenyl ether (commercial pentabromodiphenyl ether)
HBCD = Hexabromocyclododecane
pg 2005 WHO-TEQ/m^3 = picogram 2005 World Health Organization toxic equivalents per cubic metre
pg I-TEQ/m^3 = picogram international toxic equivalents per cubic metre

Note: The mean local ambient air concentration of hexachlorobenzene and pentachlorobenzene were lower than that of the values reported in Japan, which were 96 pg m^{-3} and 61 pg m^{-3} respectively, where "pg m^{-3}" stands for "picogram per cubic metre".