

Updates on Per- and Polyfluoroalkyl Substances (PFAS)

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Presented at: SCIC-Joint Agencies Dialogue Session

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Background

Per- and Polyfluoroalkyl Substances (PFAS)

- PFAS is a group of man-made chemicals that consist of a chain of carbon atoms bonded to fluorine atoms
- Common characteristics of PFAS are:
 - ❑ Chemical stability due to strong C-F bonds, giving rise to their environmental persistence
 - ❑ High mobility which confers them long-range transport potential traceable to remote regions
 - ❑ Tendency to bioaccumulate and biomagnify in biota through contamination of food chains
- In line with Singapore's obligations under the Stockholm Convention, NEA regulates 3 types of PFAS as hazardous substances (HS) under the Environmental Protection and Management Act (EPMA) and EPM (Hazardous Substances) Regulations
 - ❑ Perfluorooctanoic acid (PFOA), its salts and related compounds
 - ❑ Perfluorooctane sulfonic acid (PFOS), its salts and related compounds
 - ❑ Perfluorohexane sulfonic acid (PFHxS), its salts and related compounds
- Current scientific research suggests that exposure to high levels of these PFAS may lead to adverse health outcomes such as cancer, suppressed immune system and adverse metabolic effects
- Import, manufacture and use of PFOA, PFOS and PFHxS are prohibited apart from specific exemptions which are allowed under the Stockholm Convention
 - ❑ Exemptions expire 5 years after the date of entry into force

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Upcoming PFAS Controls in Singapore

(A) PFAS in Fire-Fighting Foams

- Singapore is a party to the Stockholm Convention. The Stockholm Convention allows certain PFAS to be used in fire-fighting foams, but only until 2025
- With effect from **1 Jan 2026**, Singapore's obligation under the Stockholm Convention will disallow the import and use of fire-fighting foams containing certain PFAS above threshold limits for trace contaminants in Singapore
- NEA has carried out industry consultations with relevant stakeholders (i.e. oil refineries, chemical companies, fire-fighting foam suppliers and SCDF)
 - ❑ Viable alternatives are readily available in the market
 - ❑ Costs and effectiveness of Fluorine-Free Foams (FFF) vary significantly with brands/models
 - ❑ Other costs may be incurred in switching out foams containing PFOA/PFOS (e.g. from potential system modifications)
 - ❑ Some lead time may be required to replace or modify hardware involved in dispensing foam

(A) PFAS in Fire-Fighting Foams

- To address stakeholders' concerns, Singapore will adopt threshold limits in line with EU's threshold limits for the 3 types of regulated PFAS chemicals in fire-fighting foams:
 - ❑ PFOA: 25ppb
 - ❑ PFOS: 10,000ppb
 - ❑ PFHxS: 100ppb
- Affected stakeholders (including SCDF) should be able to comply with the threshold limits of regulated PFAS in fire-fighting foams
- Industry are to dispose of their existing foams containing PFAS above threshold limits for trace contaminants via NEA licensed Toxic Industrial Waste Collectors (TIWCs)
- NEA will issue a Circular in Q1 2024 to inform industry of the phase-out timeline for the 3 types of regulated PFAS chemicals in fire-fighting foams

(B) Long-Chain C9-C21 Perfluorocarboxylic Acids (LC-PFCAs)

- LC-PFCAs belong to PFAS chemical group with carbon lengths of 9 to 21
- Persistent Organic Pollutant Review Committee (POPRC) of the Stockholm Convention established that LC-PFCAs, their salts and related compounds are likely to lead to significant adverse human health and/or environmental effects
 - ❑ Recommended listing LC-PFCAs in Annex A (i.e. for elimination)
 - ❑ POPRC is conducting further assessment on specific exemptions
- As POPRC is likely to recommend for their adoption into Stockholm Convention at the 12th Conference of Parties (COP) held in 2025, NEA will be regulating LC-PFCAs under the EPMA and EPM(HS) Regulations to track their import, production and usage in Singapore
- Prior to the inclusion of LC-PFCAs in the Stockholm Convention, companies are allowed to continue using LC-PFCAs with a valid HS Licence/Permit
 - ❑ Import, production and use will only be banned when LC-PFCAs are formally adopted into Annex A of the Stockholm Convention text

Tentative Implementation Timeline

- Mid-2024: Gazette of legislative amendments
- **Dec 2024:** Control (i.e. need for HS licence/Permit) of LC-PFCAs takes effect

Chemical Reporting Framework

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- NEA is planning to implement a chemical reporting framework for Hazardous Substances (HS) licence and permit holders to comply with as a licensing condition
- Objectives of chemical reporting framework are to:
 - Better understand chemicals that are being imported and/or manufactured in Singapore but currently not regulated by any Agency
 - Identify and prioritise chemicals that pose environmental and public health concern for potential control
 - Allow for the protection and management of the environment

Pilot Trial

- A pilot trial was conducted with 6 companies¹ from 1 Oct 2021 to 30 Mar 2022 to assess feasibility of such framework
 - ❑ The proposed chemical reporting framework is adapted from similar chemical reporting frameworks in the US and EU
- Outcomes from Pilot Trial:
 - ❑ 157 chemicals currently not regulated by any Agency in Singapore were reported
 - ❑ Small proportion (3%) of reported chemicals had been identified for further review by NEA for potential control, due to their potential environmental or health hazards

¹Shell, ExxonMobil, Dow Chemical, Eastman, Evonik, Croda

Industry Consultation

- Apart from consulting pilot trial companies in 2022/2023, NEA also engaged industries via EDB and the Advisory Committee on Hazardous Substances and Toxic Wastes (HSTW)¹ to obtain preliminary feedback
- No major objections raised during these engagement, but suggestions were provided for NEA to further finetune scope of reporting
 - 1) Pilot trial companies
 - NEA to streamline/refine data reporting requirements
 - 2) EDB
 - Industry is not keen on development of an EU REACH-like system which requires all new chemicals to be registered before they can be manufactured/imported
 - Scope should be risk-based (e.g. toxic substances) rather than a catch-all situation to justify need for reporting
 - 3) Advisory Committee on HSTW
 - Suggested for NEA to look into possibility of including chemicals found in and/or recovered from toxic wastes in the scope for reporting, especially if these chemicals are dangerous substances

¹The Advisory Committee on HSTW provides technical advice to NEA and is chaired by Prof Wong Ming Wah from Dept of Chemistry (NUS) and comprises members from academia (e.g. NTU), agencies (e.g. SFA, HSA, MOM) and industry associations (e.g. SCIC, SMF, SPMA, WMRAS)

2 Implementation of Mandatory Chemical Reporting Framework

Implementation of Mandatory Chemical Reporting Framework

- NEA has assessed that chemical reporting framework needs to be implemented to better protect public health & safety, and manage potential environmental concerns
- To reduce regulatory burden to industry, NEA has refined the chemical reporting framework:
 - ✓ Limit framework to existing hazardous substances licensees and permit holders for now; and
 - ✓ Minimise scope of reporting and requirements

Tentative Requirements of Mandatory Chemical Reporting Framework

Target Group	Existing Hazardous Substances Licence and Permit Holders
Scope of Chemicals to be Reported	<ol style="list-style-type: none"> 1) Pure substances only 2) Chemical substances manufactured and/or imported >1MT per year 3) (a) Category 1 and 2 acute toxicity and/or CMR¹ chemicals under Globally Harmonised System (GHS) classification; or (b) Persistence and Bioaccumulative (PB) chemicals (where information is available) <p><u>Exclusions:</u> Chemicals currently regulated by other agencies, polymers, mixtures, articles and consumer products, chemicals used for R&D, unintentional impurities</p>
Information to be Submitted	<ul style="list-style-type: none"> • Chemical identity • Production and/or import amount (max. capacity) • Use type • Safety data sheet (SDS)
Frequency of Reporting	<ul style="list-style-type: none"> • One time reporting of chemicals that are currently unregulated during first HS licence/permit renewal • Subsequent reporting during annual licence/permit renewal is only required if there are <ul style="list-style-type: none"> <input type="checkbox"/> New chemicals (not reported previously); or <input type="checkbox"/> Changes to previously reported chemicals: <ul style="list-style-type: none"> ▪ Changes to type of chemical use; or ▪ Increase/Reduction in production and/or import amount by 2MT/year; or ▪ Changes in assessment of chemical properties
Format of Reporting	<ul style="list-style-type: none"> • Reporting via FormSG or excel file

¹Carcinogenic, Mutagenic, Reproductive toxicity

Implementation of Mandatory Chemical Reporting Framework

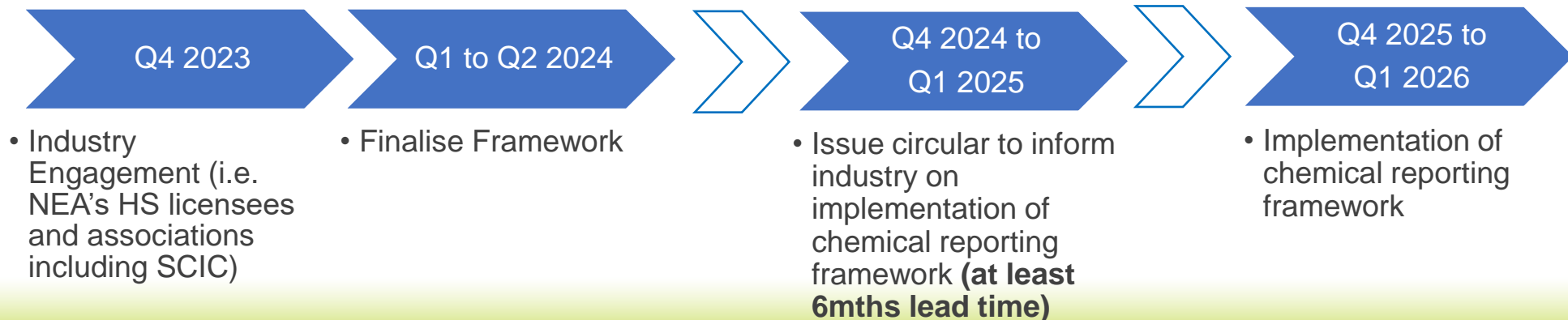
(1) Actions by Companies

- Companies to carry out self-screening of chemicals that they import and/or manufacture
- Report only for chemicals that fall within the reporting scope during HS licence or permit renewals

(2) Actions by NEA

- NEA to publish a guidance document to guide industry in fulfilling their reporting requirements
- NEA collates data and carries out assessment on whether these chemicals should be controlled
- Meanwhile, companies are allowed to continue dealing with or using the chemicals without restrictions

Next Steps and Tentative Timelines:



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