

POPs – Where are we now?

Mark Heggie

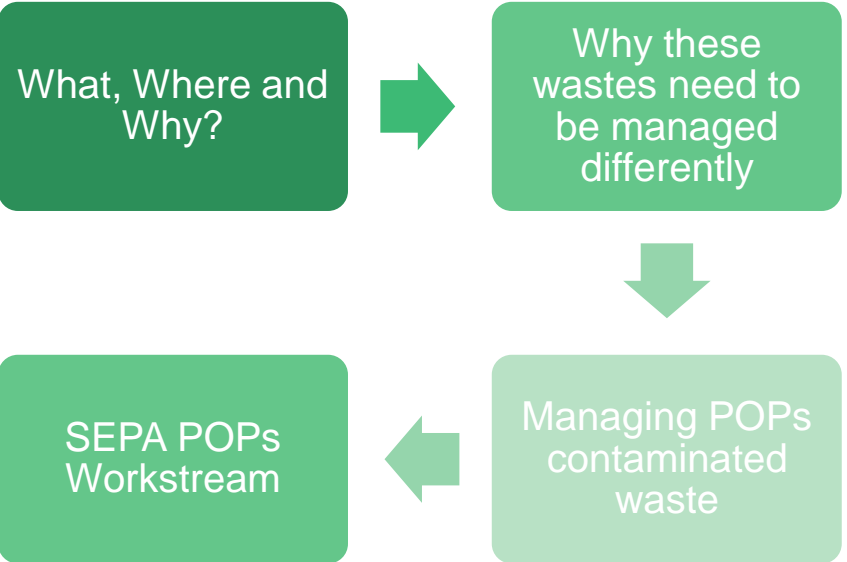
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What we will be covering ...



POPs – Where are we now?

What Are POPs?

POP POPs are a group of Hazardous manmade chemicals:

2009

- Alpha hexachlorocyclohexane (hexachlor)
 - Used widely during the production boom after WWII
- Hexachlorobiphenyl
 - Initially beneficial however unforeseen effects on human health and environment
- Pentabromodiphe.
 - Initially beneficial however unforeseen effects on human health and environment
- Chlordecone
 - Remain intact in the environment for a long time
- Perfluoroo.
 - Remain intact in the environment for a long time
- Beta-endosulfa
 - Can be distributed long distances

2015

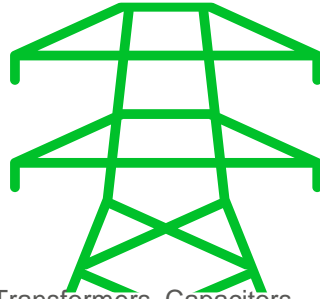
- Hexachlorobutadiene (HCBD)
 - They accumulate in the fatty tissue of humans and wildlife
- Pentachlorophenol
 - They accumulate in the fatty tissue of humans and wildlife
- Forever Chemicals.....

Other chemicals shown: Toxaphene, DDT, Polychlorinated Dibenz-p-dioxin (PCDDs), p,p'-dicofol, o,p'-dicofol, Pentadecafluorooctanoic acid (PFDA).

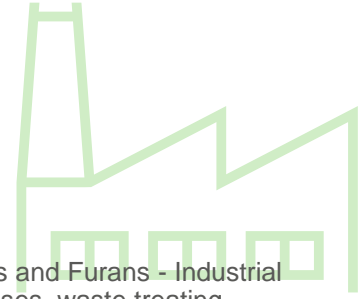
POPs Waste Streams - Current



Pesticides - DDT, Aldrin, Eldrin, Mirex, etc.



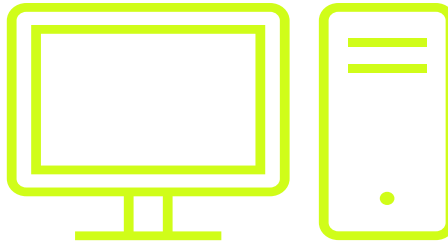
PCBs - Transformers, Capacitors, Plastics, Paints, etc.



Dioxins and Furans - Industrial processes, waste treating, uncontrolled combustion, etc.



Fire Fighting Foams - PFOS and PFOA, PFAS Family (watch this space ...)



WEEE - POP BDEs

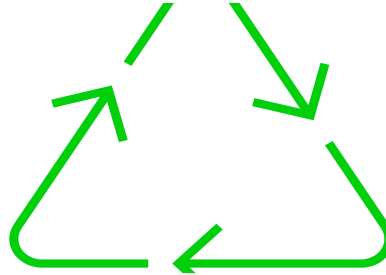


WUDS - POP BDEs

POPs Waste Streams - Future



C & D Waste



Recycled Materials



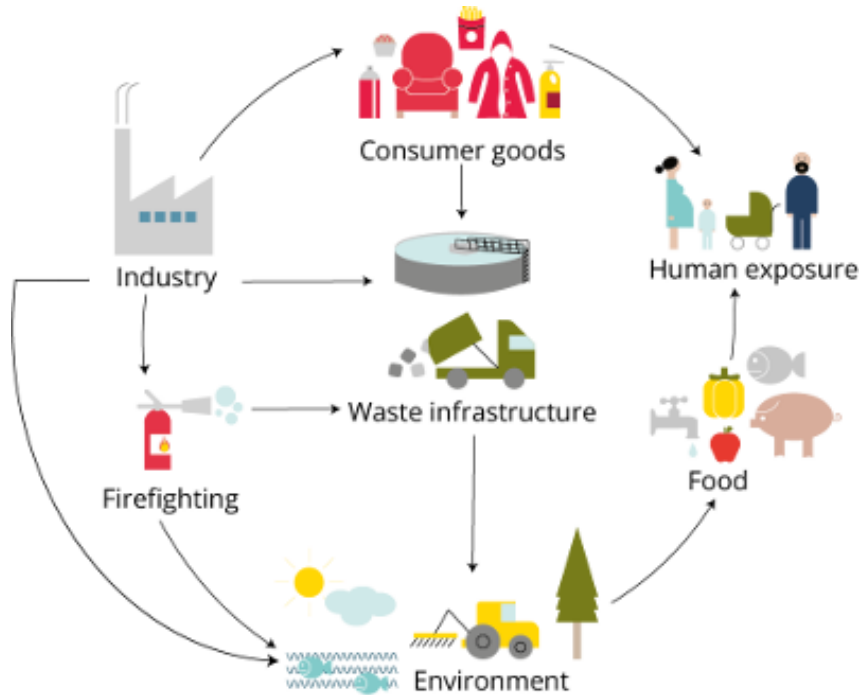
Non-Stick Cookware



Waterproof Textiles

POPs – Where are we now?

Why Do POPs Matter?



Human Health and Environment Impacts

- Endocrine disruption
- Cardiovascular diseases
- Cancers
- Diabetes
- Birth defects
- Dysfunctional immune and reproductive systems



POPs – Where are we now?

POPs – Forever Chemicals and Your Waste

POPs Framework

Stockholm Convention

Stockholm
Convention

European
POPs
Regulations

UK POPs
Regulations



Global Treaty

- Protect human health and the environment from POPs
- Adopted in 2004
- 152 Signatories
- UK is one of the original members



Parties must take measures to:

- Eliminate the production and use of chemicals listed in Annex A
- Restrict the production and use chemicals listed in Annex B
- Reduce the unintentional releases of chemicals listed in Annex C

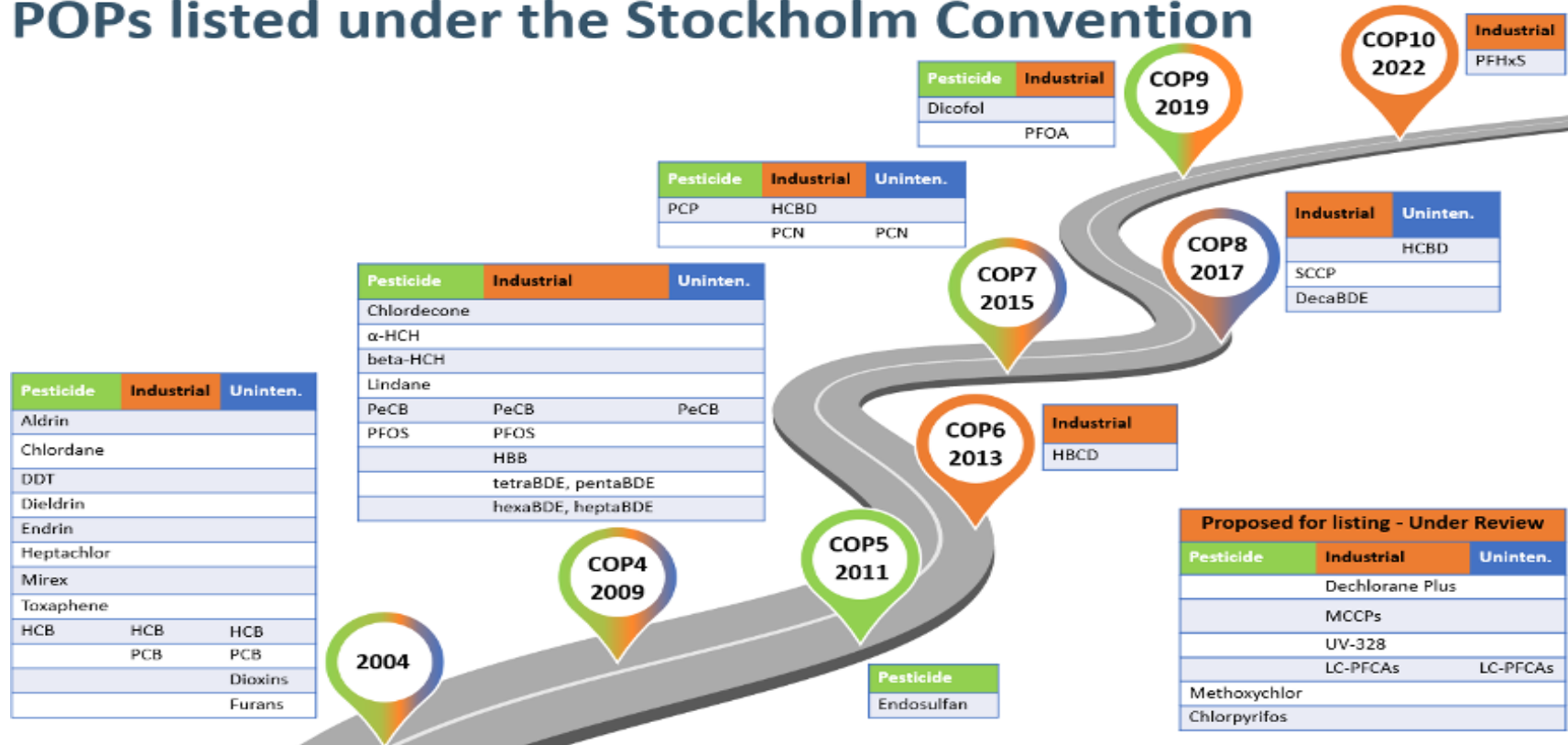


Additional duties on signatories include:

- Identification and management of stockpiles
- Identification of competent authority
- Reporting, etc.

POPs – Where are we now?

POPs listed under the Stockholm Convention



<https://www.unep.org/explore-topics/chemicals-waste/what-we-do/persistent-organic-pollutants>

UK POPs Regulations – summary of key duties

Reg. 5: Stockpile

- 50kg or more and use is still permitted notify CA
- If use is no longer permitted, stockpile must be managed as a waste

Reg. 7: Waste Management & Annex V

- Storage, Movement, Treatment and Disposal restrictions
- Control and Traceability (CA)

Reg. 9: Implementation Plan

- Each Party (UK) is required to develop a plan for the implementation of its obligations
- NIP details UK's performance in meeting past, present and future commitments under the convention

Reg. 19: Competent Authority

- MS to designate a CA
- CA responsible for the administrative tasks and enforcement required by this Regulation

Annexes

- I to III - List of POPs, POPs subject to restrictions and POPs subject to release reduction provisions
- IV & V – Waste Management controls incl. disposal and recovery options

Regulation 7 - Waste Management

Reg. 7(1)

Producers/Waste Holders to avoid where feasible contamination of POPs or POPs contaminated waste with other wastes

Reg. 7(2)

POPs or POPs contaminated waste must be disposed of or recovered without undue delay

Disposal/Recovery must destroy or irreversibly transform POPs content

Isolated POPs must be destroyed or irreversibly transformed

Reg. 7(3)

Disposal or recovery operations that may lead to recovery, recycling, reclamation or re-use on their own of POPs is prohibited

Reg. 7(4)

Wastes containing POPs below relevant concentration are subject to normal waste management controls

Derogation allowing disposal to permanent storage under certain conditions

Reg. 7(6)

Member States to ensure the control and traceability of waste containing POPs or contaminated by POPs. (Reg. 7(6))

Storage, transportation, pre-treatment and treatment

EfW, HTI, Cement Kiln, and Co-Incineration. Landfill not an option

Pre-treatment needs to ensure that POPs content is removed and treated appropriately

Mixing and dilution not allowed. Derogation restricted to specific waste types

Managing POPs Contaminated Waste (1)

Check if your waste contains POPs

- MSDS and/or Manufacturer Information
- Chemical Analysis
- XRF testing
- Refer to Agency guidance
- If you don't know assume POPs!!!!



Classify your waste correctly

- Waste holders have a duty to describe their waste fully, to ensure that it is handled appropriately
- EWC and description must reflect presence of POPs
- SWCN and WTN should detail likely POPs present
- Appropriate EWC may not always be Hazardous!!!



Storage of POPs Wastes

- Storage/Sorting should not damage the waste, cause release of POPs or contaminates other waste
- If mixed with non-POPs wastes the waste mass may be deemed POPs waste
- POPs contaminated waste must be destroyed even if the mixing has diluted the POPs concentration

Waste holders have a duty of care to ensure the person receiving the waste is authorised to do so!

POPs – Where are we now?

Managing POPs Contaminated Waste (2)

Collection

- Where possible separate collections for POPs Wastes should be carried out
- POPs can be collected in the same vehicle as other waste items if POPs are:
 - Not damaged
 - Segregated and not mixed with other wates
 - Segregated when unloadedd
- Loads can be protected during collection (ex. plastic sheets etc.)



Treatment (Removing POPs)

- POPs waste can go to a suitably authorised treatment plant that can separate the items, components, or materials containing POPs from the other waste or materials
- The separated items, components, or materials containing the POPs must be destroyed
- POPs waste must not be mixed with other waste before or during separation
- Processes must control and mitigate the release of POPS



Treatment (Recovery)

- You can recover waste containing POPs where the recovery process destroys the POP (ex. incineration with energy recovery)
- Operator can treat the waste to remove or separate materials that contain POPs from those that do not
- Any POPs or POPs wastes must be destroyed
- Any seperated non-POPs material can be recycled or recovered
- Processes must control and mitigate the release of POPS

If receiving waste ask for evidence to confirm presence of POPs.

Managing POPs Contaminated Waste (3)

Landfill and Permanent Storage

You must not landfill POPs or POPs Waste or wastes arising from their treatment, that may contain POPs

Permanent Storage (Reg. 7 (4)(b))

- In exceptional cases some types of Hazardous POPs waste may be permanently stored
- Applicant must provide information on the following:
 - POPs content of the waste
 - Location of facility
 - Suitability of facility
 - Demonstrate that decontamination is not feasible
 - Demonstrate that permanent storage is environmentally preferable to destruction or irreversible transformation

Managing POPs Contaminated Waste (4)

Destruction and Irreversible Transformation



Influencing Factors

- POPs properties
- POPs Waste type
- Other chemicals or material present



Options

- Physico-chemical treatment
- Incineration on land
- Using the waste as a fuel or other means to generate energy some other way
- Recycling or reclamation of metals and metal compounds (restricted)



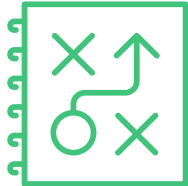
Outcome

- Complete destruction
- Irreversible transformation

POPs - Where are we now?

Managing POPs Contaminated Waste (5)

Destruction & Irreversible Transformation



Scotland has limited treatment options:

- Destruction more likely than Irreversible Transformation
- Type of POP dictates appropriate option
- EfW and Co-incineration only viable options (where appropriate)

SEPA guidance/position is influenced by:

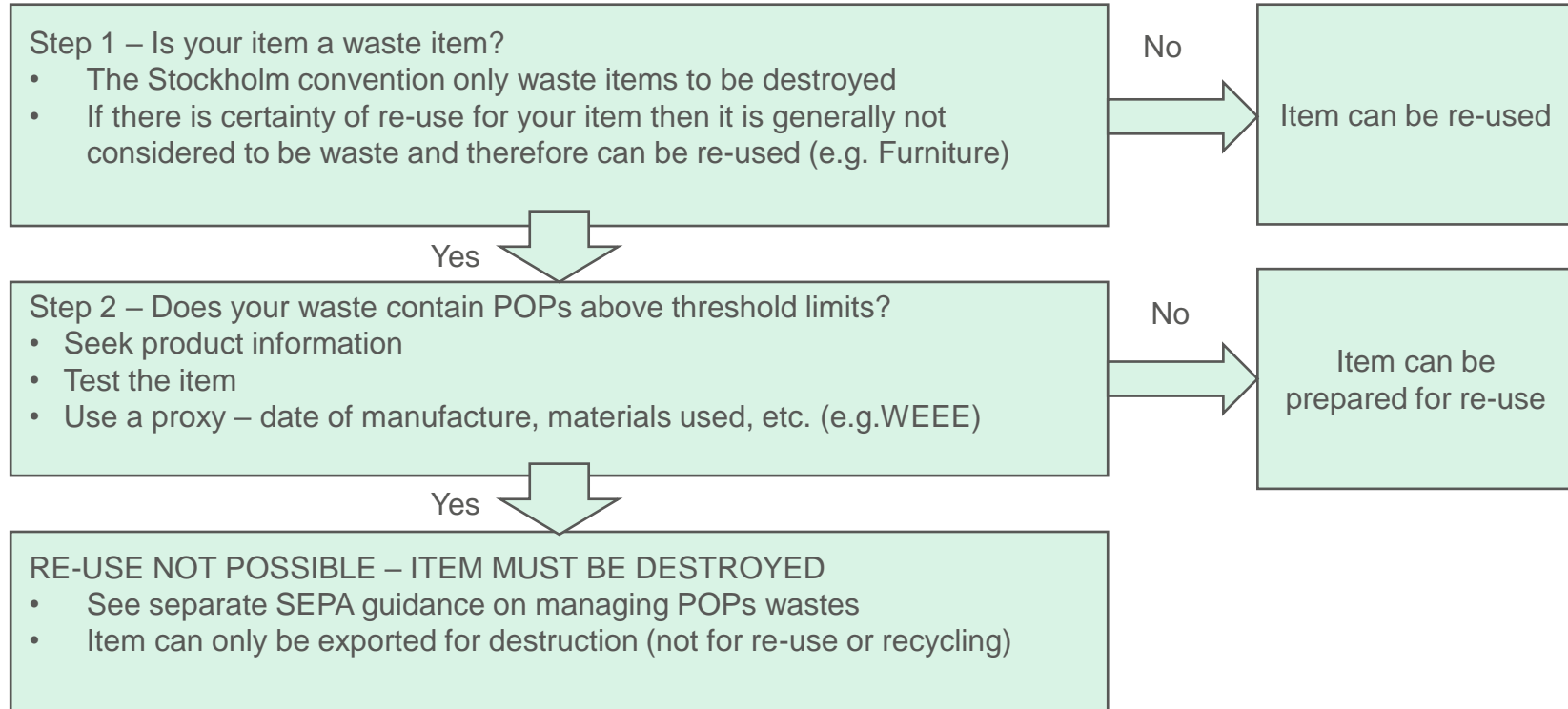
- Regulations
- Research
- Guidance
- Technical Guidelines



| Technology | POPs | |
|--|--------------|----------|
| | HBCD | POP-BDEs |
| Advanced solid waste incineration (ASWI)* | Yes | Yes |
| Cement kiln/co-incineration | Yes | Yes |
| Gas phase chemical reduction (GPCR) | Yes | Yes |
| Hazardous waste incineration | Yes | Yes |
| Supercritical water oxidation (SCWO) and subcritical water oxidation | Yes | Yes |
| Thermal and metallurgical production of metals | Not for HBCD | Yes |

- UNEP – UN Environment Programme
- ASWI - any modern incinerator capable of reaching 850 for seconds in the gas chamber.

Re-use of Items containing POPs



POPs - Where are we now?

What have SEPA been doing?

- Chemicals Strategy
- SEPA working groups
- Engagement with DAs and other UK Environment Agencies
- PCBs: maintenance of PCB register, ongoing engagement with Scottish Government to ensure 2025 deadline is met, cohort methodology ...
- Guidance:
 - WEEE: Engagement with industry, development and publication of Classification guidance, developing Re-use position...
 - Fire Fighting Foams: Engagement with industry, development and publication of Classification guidance, collation of stockpile information
 - Soft Furnishing: Engagement with industry, developing guidance, developing re-use position
 - Incoming ELVs and Construction Waste



Thank you

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