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Protecting humans and wildlife
from harmful chemicals

Creating clean material cycles: Problems and Solutions

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“Transition to a Circular Economy”

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Contents

- Introduction to CHEM Trust
- Circular economy & chemicals
- Examples of the problem
- Potential solutions
- Research priorities
- Conclusions



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About CHEM Trust

- A charity working at UK, EU & Global levels to protect humans & wildlife from harmful chemicals
- Working with scientists, technical processes and decision makers, in partnership with other civil society groups
- Focus on identification of, and action on, endocrine disrupting chemicals
- See our blog & twitter for more: www.chemtrust.org.uk

The screenshot shows the CHEMTrust website with the following content:

- Header:** CHEMTrust logo and tagline "Protecting humans and wildlife from harmful chemicals". Navigation menu: About, Our Work, Chemical Problems, Health Impacts, Wildlife Impacts, Chemicals Policy, Take Action.
- Main Article:**
 - Title:** EU Chemical Agency committee agrees that Bisphenol A in receipts poses risk to workers
 - Byline:** by MICHAEL WARHURST on JUNE 11, 2015 EDIT
 - Text:** The hormone disrupting chemical Bisphenol A (BPA) is used in many till (cash) receipts, and the [French government has proposed](#) that the EU should ban this use. This proposal has been under discussion in the Risk Assessment Committee (RAC) of the European Chemical Agency (ECHA), who [have just stated](#) that they agree with the French government that this chemical presents a risk to workers: [\[read more\]](#)
 - Share this:** Twitter (28), Facebook (5), LinkedIn (11), Pocket, Email, Google+.
 - Related Article:** Chemical found in till receipts affects parenting behaviour in mice
- Right Sidebar:**
 - HORMONE DISRUPTING CHEMICALS?** with a graphic that says "Hormone Disrupting Chemicals FAQ".
 - [What are Hormone Disrupting Chemicals?](#)
 - POPULAR POSTS**
 - EU Chemical Agency committee agrees that Bisphenol A in receipts poses risk to workers
 - Medicines in the Environment: A Growing Threat to Wildlife and Drinking Water
 - The EU claims that TTIP won't reduce EU food safety standards – but is this true?
 - EU Conference on hormone disruptors: What did we learn?



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Circular Economy & Chemicals

- Many restricted chemicals present in products
 - E.g. Furniture is a major – and under-investigated – reservoir of banned substances, inc. POPs [1]
- New restrictions arrive all the time
 - There will be more restrictions in the future
 - Science moves on and ignorance reduces
- Three examples of the problem:



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Example 1: Bisphenol A (BPA)

- Found to be Endocrine Disrupting Chemical (EDC) in 1938 [2]
 - Widely used in polycarbonate plastics, food can linings and thermal paper (e.g. till receipts)
- Controversial due to economic importance and complexity of effects
 - But trend towards lower dose effects, greater controls
- EU Chemical Agency Risk Assessment Committee has concluded risk from BPA in till receipts not 'adequately controlled' [3]
 - Socioeconomic impacts under discussion, but replacement cheap;
NB some alternatives also problematic
- Should thermal paper be recycled?

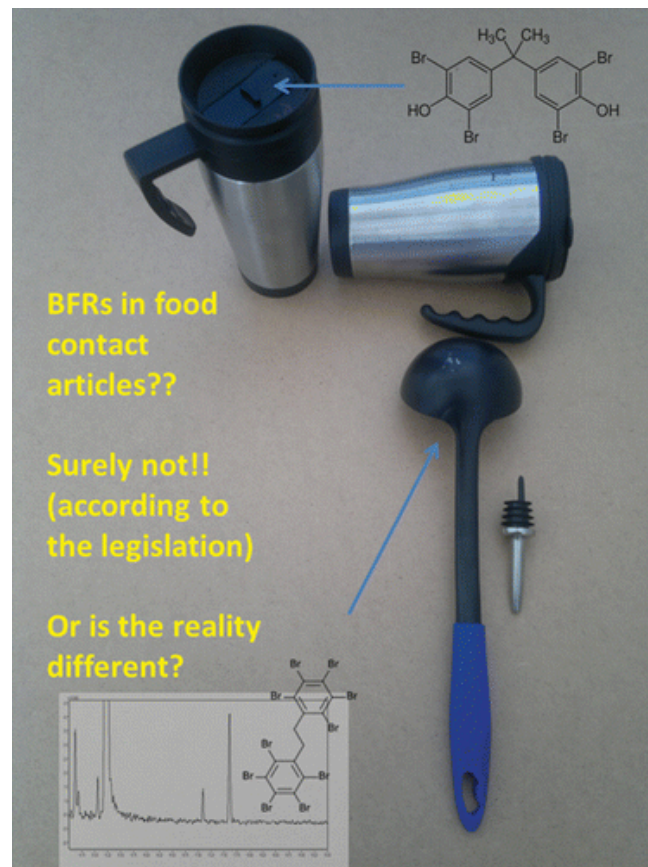


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Example 2: BFRs in plastics

- Brominated flame retardants (BFRs) used in many plastics; many now restricted
- Researchers have found them in black plastics:
 - Kitchen plastics on sale on EU market [4]
 - Childrens toys [5]
- Presumably through recycling of e.g. electronics waste





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Example 3: Food contact packaging

- Chemicals in most food contact materials do not have EU harmonised regulation
 - Just a general safety statement for chemicals in paper, board, ink, glue etc.
 - A major gap, CHEM Trust is pushing for EU action [6]
- Particular issues with chemicals in recycled paper and card:
 - These chemicals may be from ink, glue, paper, coatings in the recyclate etc etc
 - Including BPA, phthalates, perfluorocarbons (PFCs)
 - All found recently in pizza boxes in Denmark [7]



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Solutions



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Policy Briefing

Circular Economy and Chemicals: Creating a clean and sustainable circle

Executive summary

Creation of a circular economy is an important part of creating a future-focussed, sustainable economy. However, the circular economy creates some important challenges for the regulation and use of chemicals.

This briefing, part of CHEM Trust's submission to the Commission's consultation on the Circular Economy, outlines key policies and approaches that are needed. The aim has to be to create a clean circular economy, as this is the only truly sustainable approach.

It is important that the right policies are adopted in this area, otherwise the circular economy becomes a way of perpetuating the use of hazardous chemicals.

Key recommendations:



A move to non-toxic products, thus removing problems in recycling

- Regulations, regulators and industry must ensure that all chemicals of very high concern are phased out of products as soon as possible.



Faster, more precautionary, safety assessment of chemicals, assuming a circular economy. Industry should move away from problem chemicals.

- Faster identification of chemicals of very high concern, with rapid action to ensure they are substituted with safer alternatives.
- Safety assessments should assume that a circular economy is going to be in place, e.g. that 100% of sewage sludge will be used as fertiliser.
- Companies should take a forward-looking approach when producing products, avoiding chemicals likely to be restricted in the future, e.g. the ChemSec SIN list.



Better information flow on hazardous materials in products, and controls on chemicals in imported products

- The supply chain, including consumers and recyclers, should have easy access to information on identity and properties of hazardous chemicals in products.
- Imports should be subject to the same restrictions and information requirements.



Some materials should not be recycled

- Assessments should balance the value of the resource and the hazard of the chemical, with a default of no recirculation of hazardous substances.
- The EU is currently pushing to permit the recycling of products containing dangerous persistent organic pollutants. This promotion of persistent pollution is short sighted, endangering high quality recycling, health and environment.

The circular economy will only be successful in the long term if customers – including the public – are confident in the quality of recycled material. If this confidence is removed, then the market will demand virgin materials, and the attempt to create a circular economy will fail.

<http://www.chemtrust.org.uk>

Twitter: @CHEMTrust

1. A move to non-toxic products, thus removing problems in recycling
2. Faster, more precautionary, safety assessment of chemicals, assuming a circular economy.
3. Better information flow on hazardous materials in products, and controls on chemicals in imported products
4. Some materials should not be recycled



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1) Non toxic products

- All chemicals of very high concern must be phased out of products as soon as possible
 - The longer they are put in new products, the longer they will carry on going around the circle – or need to be disposed of.
- But what is called ‘toxicity’ is time dependant
 - Chemicals get more toxic, new exposures emerge
 - See “Late Lessons from Early Warnings” [8]
 - We talk about ‘toxicity’, but it’s really ‘**currently estimated toxicity**’ (CET) & it changes over time
- Long term aim must be for non-hazardous products



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2) Faster chemical assessment

- Faster identification of chemicals of very high concern
- Assessments need to be more precautionary
 - Assuming a circular economy; e.g. that 100% of sewage sludge will be used as fertiliser.
 - Assuming currently estimated toxicity likely to get worse with time, and reality of exposure to mixtures.
- Manufacturers should take a forward-looking approach
 - Use non-regulatory lists like the ChemSec's 'SIN' list [9]
 - Don't move from one problem chemical to another in a group; e.g. use ChemSec's SINmilarity tool [9]



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3) Address chemicals in articles

- Easy access to information on identity & properties of hazardous chemicals in articles
 - For the supply chain, including consumers and recyclers
 - With labelling in exceptional case of hazardous substance permitted to be recycled into new (dirty) product
- Proper Regulation of chemicals in food contact materials.
- Imports should be subject to the same restrictions and information requirements.



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4) Don't recycle some materials

- Three destinations for a waste containing hazardous chemicals:
 - (1) Landfill or (2) Incineration
 - (3) Our homes, workplace and living environment
- Shouldn't assume recycling always best option when waste contains hazardous chemicals
 - Balance value of resource vs concern re hazard
- Well controlled landfill shouldn't be dismissed
 - Plastics & climate: if not recycled then landfill generally preferable to incineration [10]. NB: Also carbon capture & storage role of landfill.
- Once 'not waste', may end up anywhere – e.g. plastic pipes being used as a toy in a kindergarten
 - Major risk of scandal, loss of confidence in recycled products



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Some priorities for research

- Policy research
 - Accelerated, more precautionary, methods for assessing chemical safety and for acting rapidly on concerns
 - Methods to improve information flow on chemicals in articles
 - Development of new policies for key hot spots – e.g furniture
- Analytical Research
 - Wide spectrum chemical analysis of finished materials to identify problems e.g. black plastic, food packaging, furniture
- Supply chain analysis
 - Investigation of supply chains to identify where contamination could be occurring, and how it could be prevented.



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Summary

- **The only sustainable circular economy is a clean one**
 - The circular economy depends on public confidence in the quality of recirculated materials.
 - If this confidence is removed, then the market will demand virgin materials, and the attempt to create a circular economy will fail.
- **Solutions:**
 - Faster, more precautionary, chemical assessment, regulation & action
 - Effective information on hazardous chemicals in articles, and restrictions in place (and enforced) on imported articles.
 - Proper regulation of chemicals in food contact packaging
 - Don't recycle some materials
- Briefing: <http://www.chemtrust.org.uk/circulareconomy>



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References

- [1] Stubbings, W. A., & Harrad, S. (2014). *Extent and mechanisms of brominated flame retardant emissions from waste soft furnishings and fabrics: A critical review*. *Environment International*, 71, 164-175
<http://www.sciencedirect.com/science/article/pii/S0160412014001822>
- [2] Dodds, E. C.; Lawson, W., "Molecular structure in relation to estrogenic activity. Compounds without a phenanthrene nucleus". *Proc. Royal Soc. Lon. B.* 1938, 125, 222- 232.
- [3] EU Chemical Agency committee agrees that Bisphenol A in receipts poses risk to workers, Jun 2015:
<http://www.chemtrust.org.uk/eu-chemical-agency-committee-agrees-that-bisphenol-a-in-receipts-poses-risk-to-workers/>
- [4] Occurrence of brominated flame retardants in black thermo cups and selected kitchen utensils purchased on the European market, *Food Additives & Contaminants: Part A*, Volume 30, Issue 11, 2013:
<http://www.tandfonline.com/doi/abs/10.1080/19440049.2013.829246#.VYp4uVWWGMU>
- [5] Toxic Toy or Toxic Waste: Recycling POPs into New Products, IPEN, 11th Oct 2015
<http://ipen.org/news/toxic-toy-or-toxic-waste-recycling-pops-new-products>
- [6] *Chemicals in Food Packaging: A can of worms?*, CHEM Trust, Oct 2014
<http://www.chemtrust.org.uk/chemicals-in-food-packaging-a-can-of-worms/>
- [7] *Test: Unwanted chemicals found in pizza boxes*, Danish Consumer Council, 19th Oct 2015
<http://kemi.taenk.dk/bliv-groennere/test-unwanted-chemicals-found-pizza-boxes>
- [8] Late Lessons from Early Warnings II, European Environment Agency, 2013
<http://www.eea.europa.eu/publications/late-lessons-2>
- [9] ChemSec 'Substitute it Now' list and Sinmirality Tools:
<http://www.chemsec.org/what-we-do/sin-list/sinimilarity> <http://www.chemsec.org/what-we-do/sin-list>
- [10] *Final report of a study undertaken for the European Commission Environment Directorate General by AEA Technology to assess the climate change impacts of options for municipal solid waste management in the EU*, 2001
http://ec.europa.eu/environment/waste/studies/climate_change.htm