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# Towards sustainability: Is green chemistry & engineering delivering?

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## About CHEM Trust

- 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

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## Green chemistry as a concept

- Not a new concept now
  - E.g. Green Chemistry & regulation article, in April 2002 [1]
- Seems like a good idea, but a 'breakthrough'?
  - Not visible yet?
- A driver, or just a tool?
  - Following other regulatory & sustainability pressures?

**NEWS & VIEWS**

### The importance of improving regulation in encouraging the development and adoption of greener chemical processes and products

**Michael Warhurst**, *Safer Chemicals Campaigner at Friends of the Earth in London, UK, argues that, in addition to the Principles of Green Chemistry, there is a need for the development of a regulatory system that encourages the application of green chemistry*

**Introduction**  
The concept of the 12 Principles of Green Chemistry, developed by Paul Anastas and John Warner, has become a widely used framework for assessing the environmental impact of chemical processes. However, the implementation of these principles is often hindered by a lack of regulatory support. This article discusses the importance of improving regulation to encourage the development and adoption of greener chemical processes and products.

**The role of regulation in the adoption of green chemistry**  
Regulation plays a crucial role in the adoption of green chemistry. It can provide a framework for assessing the environmental impact of chemical processes and encourage the development of greener alternatives. However, current regulatory systems are often outdated and do not provide the necessary support for the adoption of green chemistry.

**Regulatory gaps**  
There are several regulatory gaps that hinder the adoption of green chemistry. These include a lack of clear definitions for green chemistry, a lack of consistent standards for assessing the environmental impact of chemical processes, and a lack of incentives for the development of greener alternatives.

**Regulatory drivers**  
There are several regulatory drivers that can encourage the adoption of green chemistry. These include the development of clear definitions for green chemistry, the implementation of consistent standards for assessing the environmental impact of chemical processes, and the introduction of incentives for the development of greener alternatives.

**Conclusion**  
Improving regulation is essential for encouraging the development and adoption of greener chemical processes and products. This requires a combination of regulatory drivers and the addressing of regulatory gaps.

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## Some problems so far

- A tendency to focus on on reactions and feedstocks, rather than the service produced
  - Is this insurmountable?
- Tends to lack analysis of the regulatory/policy system that could facilitate adoption
  - Due to strong US base, where the chemical regulatory system is ossified?
  - Due to unwillingness to engage in discussion on active policy (beyond funding?)
    - Both from academia and industry

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## Are EU chemical policies supportive?

- Not where there are big regulatory holes
  - In particular, chemicals in food contact materials made of paper, card, ink, glue
    - Lacks harmonised EU regulation, so reducing pressure for development and use of safer alternatives [2]
- What about REACH?
  - In theory it should be – see my article in 2002!
  - But CHEM Trust & others have big concerns
    - Particularly with authorisation:

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## What is an 'available' safer alternative?

- Worrying recommendations from ECHA:
  - Proposal to authorise paints containing lead chromate
    - The EU paint industry is not happy about this [3]
  - Proposal to allow widespread use of DEHP in PVC
    - When many alternatives to PVC and DEHP are available [4]
- If authorisation becomes a method of facilitating widespread use of sVHC chemicals, this will discourage innovation & green chemistry
- Key issue is reasonable assessment of “*availability*” of safer alternatives
  - Including acceptance that safer alternatives may initially cost more than established chemicals.

## Conclusions

- There needs to be more focus on the ultimate service provided, and how to green this
  - Challenge: not always about the chemical industry
  - Should be a full member of the “Green Economy” agenda
- Defining ‘Greenness’ is still a challenge
  - Different may not be better
  - Bio-based feedstock has its own sustainability issues, including land footprint, water footprint & carbon footprint [5]
- Regulatory system must promote green, not brown
  - Regulators need to get tougher
  - Producers of problem chemicals too noisy, producers of alternatives too quiet.



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